

**Investigating the Impact of Enterprise Social Media on  
Job Satisfaction of Chinese Employees in Public  
Sector: Empirical Study on *DingTalk***

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## Abstract

Over past decades, the digital wave of various technology tools, such as enterprise social media (ESM), has disrupted the routine practices, structures, and relationships of contemporary organisations in China in novel ways. The emerging ESM, such as *DingTalk*, now prevails and is adopted by hundreds of millions of users in enterprises in China. Especially during the pandemic, in the past three years, remote working with *DingTalk* has led to the innovative evolution of routine works and accelerated the informatisation progress of public institutions. However, besides the many benefits brought by the excellent tool, many concerns such as technostress, overload, groupthink, and privacy invasion deserve more attention from scholars. Thus, this study investigates on the essence of the *DingTalk* phenomenon and how it influences people in terms of constructive impacts and destructive issues within various public institutions in China. Furthermore, this study establishes a theoretical framework to clarify relationships between the job satisfaction of public employees and *DingTalk* usage, from the perspectives of technology affordances, determinants of JS, JD-R theory, and sociomateriality theory.

Fitting with the research paradigm of hermeneutic phenomenology, the research applied pragmatic mixed methods with a social constructionist stance to guide the study. Thus, 25 in-depth interviews with public employees in diverse job positions were conducted in six chosen state institutions to find out their lived working attitudes, behaviours, and experiences during using *DingTalk*. Additionally, based on the qualitative findings, the 460 localised questionnaire with validated scales were conducted online to test four relational hypotheses, as a supplementary description for a rich picture of the *DingTalk* phenomenon.

Although there are numerous researches on the employees' job satisfaction (JS), ESM technology, and their associations in Western enterprises, inadequate empirical exploration of relationship between Chinese employees' JS and usage of *DingTalk* in the public sector is discussed. By addressing some research gaps, this study contributes to academic research and practical management in three aspects. Firstly, the exploration of the *DingTalk* phenomenon can benefit public sector in China, in view of self-management technology, leadership, and innovative technology implementation, with descriptive evidences and referenced reasons of diverse perspectives from *DingTalk* practitioners. Secondly, extending the knowledge from traditional job satisfaction research studies and related theories, the presented theoretical framework identifies significant determinants of the JS of public employees, examines the mediator of *DingTalk* usage and moderators on the well-being of employees, and specifies bilateral influences of technology affordances. Furthermore, practical managerial strategies are recommended to improve the use or design of ESM tools, to benefit from technological advances, and prompt constructive impacts on individuals and organisations.

**Keywords:** enterprise social media, *DingTalk*, phenomenology, job satisfaction, the public sector in China, technology affordance, sociomateriality

## Abbreviations

<b>ANOVA</b>	analysis of variance
<b>ANT</b>	actor network theory
<b>AVE</b>	average variance extracted
<b>B2B</b>	business to business
<b>CFA</b>	confirmatory factor analysis
<b>CNNIC</b>	China Internet Network Information Center
<b>CR</b>	construct reliability
<b>CWB</b>	counterproductive work behaviour
<b><i>DingTalk</i></b>	<i>DingTalk</i>
<b>DV</b>	dependent variable
<b>EFA</b>	exploratory factor analysis
<b>ESM</b>	enterprise social media
<b>ESN</b>	enterprise social network
<b>ICT</b>	information and communications technology
<b>IT</b>	information technology
<b>IV</b>	independent variable
<b>JCT</b>	job characteristics theory
<b>JDI</b>	Job Descriptive Index
<b>JD-R</b>	Job Demand Resource
<b>JDS</b>	Job Diagnostic Survey
<b>JIG</b>	Job in General
<b>JP</b>	job performance
<b>JS</b>	job satisfaction
<b>MSQ</b>	Minnesota Satisfaction Questionnaire
<b>TA</b>	thematic analysis
<b>TAM</b>	technology acceptance model
<b>OA</b>	office automation
<b>OB</b>	organisational behaviour
<b>OBSE</b>	organisational-based self-esteem
<b>OCB</b>	organisational citizenship behaviour
<b>POS</b>	perceived organisational support
<b>PSM</b>	public service motivation
<b>QZPS</b>	Qingnian Zhongguo Personality Scale
<b>SDT</b>	self-determination theory
<b>SEM</b>	structural equation modelling
<b>SM</b>	social media
<b>SNS</b>	social networking sites
<b>SPSSAU</b>	statistical product and service solutions automatically
<b>W_ICT</b>	work-related use of information and communications technology after hours

## List of Illustrations

Figure 1-1. Six mainstream integrated ESM platforms in China.....	5
Figure 1-2. Main interface of DingTalk on mobile phone.....	12
Figure 1-3. Research flowchart.....	23
Figure 2-1. Conceptual model from literatures.....	78
Figure 3-1. Sequential design of mixed methods.....	89
Figure 3-2 Conceptual model with mixed methods design.....	91
Figure 3-3. Data collection of sequential mixed methods.....	100
Figure 3-4. The sampled number of DT users in various public institutions.....	117
Figure 4-1. Process of data coding analysis.....	129
Figure 4-2. Refining themes from codes and sub-themes.....	134
Figure 4-3. Final thematic map.....	144
Figure 4-4. Flowchart of data statistical analysis.....	146
Figure 4-5. Average overall satisfaction in different sample category.....	155
Figure 4-6. Variance comparisons for different organisation.....	156
Figure 4-7. The path diagram of five constructs.....	159
Figure 4-8. SEM diagram with standardised regression coefficients.....	161
Figure 4-9. Answers to “What improvement for <i>DingTalk</i> can increase JS”.....	164
Figure 4-10. Improvement suggestions for <i>ESM</i> usage.....	165
Figure 5-1. Conceptual framework of the study.....	169

## List of Tables

Table 1-1. Main functions of <i>DingTalk</i> .....	10
Table 2-1. Existing studies of affordances classifications.....	72
Table 3-1. Design process of interview questions.....	93
Table 3-2. Structured composition of questionnaire from interview questions.....	96
Table 3-3. Participants in six chosen public institutions.....	105
Table 3-4. Profile information of interviewing participants.....	107
Table 3-5. Description of various validity.....	120
Table 4-1. From initial codes to core codes.....	131
Table 4-2. Selected codes, major themes, and explanations.....	135
Table 4-3. Reliability statistics of five dimensions.....	148
Table 4-4. Test of KMO and Bartlett.....	149
Table 4-5. The Measurement items of variables and AVE, CR.....	150
Table 4-6. Pearson correlation and AVE square root of five factors.....	151
Table 4-7. Frequency analysis of categorical data.....	152
Table 4-8. One-way ANOVA of <i>DingTalk</i> using time.....	154
Table 4-9. Pearson correlation analysis.....	157
Table 4-10. Summary of paths and model regression coefficients.....	159
Table 4-11. Model fit index of path analysis.....	160
Table 4-12. Model fit index of SEM.....	163
Table 6-1. Examples of six chosen public institutions and their <i>DingTalk</i> use strategy.....	189

## Table of contents

### I

<b>Declaration</b> .....	<b>I</b>
<b>Acknowledgements</b> .....	<b>II</b>
<b>Abstract</b> .....	<b>III</b>
<b>Abbreviations</b> .....	<b>IV</b>
<b>List of Illustrations</b> .....	<b>V</b>
<b>List of Tables</b> .....	<b>VI</b>
<b>Table of contents</b> .....	<b>VII</b>
<b>Chapter 1. Introduction</b> .....	<b>1</b>
1.1 Enquiry Overview .....	1
1.2 Research Background .....	2
1.2.1 General Development of ESM .....	2
1.2.2 Background of <i>DingTalk</i> in China .....	4
1.2.3 Opportunities and Challenges of Using <i>DingTalk</i> in Public Sector in China.....	6
1.2.4 Functions and Features of <i>DingTalk</i> .....	10
1.3 Research Gaps .....	13
1.4 Rationale of the Study.....	16
1.5 Research Questions.....	20
1.6 Research Aim and Objectives .....	21
1.7 Thesis Structure .....	23
1.8 Summary .....	25
<b>Chapter 2. Literature Review</b> .....	<b>27</b>
2.1 Introduction.....	27
2.2 Conceptual Clarification: SM .....	27
2.3 Conceptual Clarification: ESM .....	31
2.3.1 Taxonomy of ESM.....	33
2.3.2 Technology Affordances of ESM .....	35
2.3.3 Benefits of ESM.....	37
2.3.4 Risks of ESM .....	39
2.4 Examining JS and Related Concepts .....	43
2.4.1 The Concept of JS.....	43



2.4.2 Presumed Factors of JS and Relation to ESM .....	44
2.4.3 Behavioral Outcomes of JS and ESM .....	55
2.4.4 The Concept of JP.....	58
2.4.5 Measurement of Job Satisfaction.....	60
2.4.6 The Concept of PSM .....	63
2.5 Related Theories and the Relation to ESM .....	66
2.5.1 ANT and Sociomateriality.....	66
2.5.2 Theory of ESM's Affordances .....	69
2.5.3 Theory of JD-R .....	75
2.6 Summary .....	77
<b>Chapter 3. Research Methodology .....</b>	<b>79</b>
3.1 Introduction.....	79
3.2 Research Paradigm .....	79
3.2.1 Research Philosophy .....	82
3.2.2 Phenomenological Research .....	85
3.2.3 Methodological Design .....	88
3.3 Data Collection Methods.....	100
3.3.1 In-depth Semi-structured Interview .....	101
3.3.2 Semi-structured Questionnaire .....	114
3.4 Researcher's Role and Reflexivity.....	121
3.5 Ethical Considerations .....	124
3.6 Summary .....	125
<b>Chapter 4. Findings and Data Analysis.....</b>	<b>126</b>
4.1 Introduction.....	126
4.2 Thematic Analysis for Interview Data .....	126
4.2.1 Coding the Interviews.....	127
4.2.2 Identifying the Themes .....	132
4.2.3 Major Themes Relevant to the <i>DingTalk</i> Phenomenon.....	135
4.2.4 Thematic Map.....	144
4.3 Data Analysis of Semi-structured Questionnaire.....	145
4.3.1 Data Pre-processing of the Questionnaire.....	146
4.3.2 Descriptive Statistical Analysis.....	147
4.3.3 Modelling Statistical Tests.....	151
4.3.4 Data Analysis of Open-ended Questions.....	163

4.4 Summary .....	166
<b>Chapter 5. Conceptual Framework and Knowledge Contribution .....</b>	<b>168</b>
5.1 Introduction.....	168
5.2 Experiential Knowledge and Exploratory Research on Conceptual Framework.....	168
5.3 Contribution to Knowledge.....	172
5.3.1 Perspective of Technology Affordances on JS.....	172
5.3.2 Determinants of JS in the Study .....	174
5.4 Summary .....	175
<b>Chapter 6. Conclusions and Recommendations .....</b>	<b>177</b>
6.1 Introduction.....	177
6.2 Managerial Recommendations for Different Participants.....	177
6.2.1 Self-management Technology for Individuals by Sociomateriality Theory.....	177
6.2.2 Supportive Leadership and Novel Managerial Mechanism for Initiators .....	181
6.2.3 Constructive Implementation of ESM Technology for Public Institutions .....	184
6.3 Reflection on ESM-related Deployment .....	188
6.3.1 Managerial Strategies of ESM Use.....	188
6.3.2 Technical Suggestions for ESM Design .....	192
6.4 Conclusion and Discussion.....	195
6.5 Limitations and Future Research Directions .....	198
6.6 Summary of the Study .....	200
<b>References.....</b>	<b>203</b>
<b>Appendix 1. Interview Questions.....</b>	<b>245</b>
<b>Appendix 2. Demographic Information Sheets of Interview Participants.....</b>	<b>246</b>
<b>Appendix 3. Information Sheet and Consent Form for Interview Participant ..</b>	<b>247</b>
<b>Appendix 4. Thematic Analysis Process of an Interview Transcript.....</b>	<b>250</b>
<b>Appendix 5. A Summary Table of Themes from All Coded Transcripts .....</b>	<b>252</b>
<b>Appendix 6. Semi-structured Questionnaire .....</b>	<b>265</b>

# Chapter 1. Introduction

## 1.1 Enquiry Overview

Job satisfaction (JS) has been a classic topic in management research since 1935, whereas the concept of enterprise social media (ESM) emerged during the past two decades. Research on JS uses a variety of complex theories, models, and constructs to study the feelings, attitudes, and perspectives of employees towards their jobs; these experiences and judgements are a multifaceted combination of psychological, physical, and mental aspects (Spector, 1997; Aziri, 2011; Mullins and Christy, 2016; Hünefeld et al., 2020). ESM represents one of many information technology (IT) tools that have had a profound influence on contemporary society; organisations adopted ESM to facilitate efficient management and sustainable development (Leonardi et al., 2013; Ahmed et al., 2019).

There are many empirical analyses on the long-term effects of technology implementation within various organisational settings, such as the relationships between social media (SM) and job performance (JP) (Moqbel et al., 2013) and JS (Morris and Venkatesh, 2010; Fu et al., 2019). There are also studies on the impact of technology implementation on individual behaviours and organisational practices (Holtzblatt et al., 2013; Huang et al., 2015; Choroszewicz and Kay, 2020).

The majority of research studies focus on the innovations and benefits brought to all of society. However, ESM usage in the workplace is controversial, and concerns about its effects have been raised, such as psychological stress, dissatisfaction, reduced productivity (Demerouti et al., 2001; Zhang et al., 2015; Zheng, 2014; Matthes et al., 2020), and data insecurity (Picazo-Vela et al., 2012; Wu, 2018). Chu (2020) provided a meta-analytic review and statistical synthesis of ESM use and noted both positive and negative influences of ESM usage on employee outcomes. In the context of the public sector in China, the increasing use of ESM has impacted employees and their working practices; while various public workers must adapt to the new working tool, environment, and the emerging relationships between

technology and humans, and face the challenges of ESM use and confront negative emotions. Few empirical investigations have probed the relations between the use of a specific ESM and practitioners' JS in public institutions in China or in extant organisational behaviour (OB) research.

Therefore, taking *DingTalk* as an example of ESM, this thesis aims to empirically examine public sector organisations in China and identify the key associations between technology usage and the JS of public employees.

This chapter firstly introduces the research background of ESM and the *DingTalk* phenomenon in section 1.2. Then it describes the current research gaps in organisational management in overseas and domestic literatures and outlines the rationale for this study in section 1.3 and 1.4. Section 1.5 presents the research questions; section 1.6 states the research aims and four objectives. Section 1.7 gives an overview of the structure of this thesis, whereas Section 1.8 summarises this chapter.

## **1.2 Research Background**

### **1.2.1 General Development of ESM**

SM developed from technological advances between the late 1990s and early 2000s; it became a prominent global phenomenon affecting how people live, communicate, and interact in the late 2000s (Helal and Ozuem, 2019). It can be considered a set of new technologies that allow diverse and efficient online connections and relationships in business, industry, public sector, and all of society (Safko, 2012). In the existing literature, a well-known definition of SM is “a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0 and that allow the creation and exchange of user generated content” (Kaplan and Haenlein, 2010, p. 61). Kietzmann et al. (2011) put forward another general definition of SM as an interactive computer-mediated technology that facilitates the creation or sharing of information, ideas, career interests, and other forms of expression via virtual communities and networks.

The tools associated with emergent SM technologies are generally built on different user-oriented and interest-oriented designs, such as social networking, micro-blogging tools, mobile tools, and gaming systems, which are among 15 SM categories identified by Safko (2012). The rising popularity of SM provide new opportunities to network (i.e., a group of connected users linked to each other in an online context) (Looy, 2016). In social networking sites (SNSs), information and communications technology (ICT) tools can be designed into a wide range of software applications according to their diverse features and functions (Ahmed et al., 2019).

For example, such as Facebook, one of online SNSs, play a significant role in supporting and maintaining ties between people or groups of people, such as undergraduate students (Ellison et al., 2007). From the early to mid-2000s, public SM, such as My space and Facebook, was introduced into workplaces for customer support, marketing, and after-sales service (Kaplan and Haenlein, 2010; Ellison et al., 2014). Employees could independently use public SM to connect with inter-companies and solve working issues. In recent years, private social applications, such as IBM's Connections, Cisco's WebEx Social, and Oracle's Social Network, have been installed and implemented on company intranets or a firm's own servers, due to security concerns of firms. These communication tools were proved to have a significant and positive effect on JS and performance of workers (Alahmad et al., 2018). Hosted in the cloud as a software service, some integrated ESM are deployed to improve work processes, collaboration and knowledge conversations (Majchrzak et al., 2013). Proprietary SM solutions were also developed for internal systems and as commercial products, for instance, the WaterCooler system at Hewlett Packard. ESM is also reckoned to furtherly enhance weak relationships and social capital benefits (Leonardi et al., 2013). In the public sector, ESM could reinvent government–citizen relationships, change working routines, influence decision making, and affect employee productivity and organisational outcomes (Khan et al., 2011; Picazo-Vela et al., 2012; Cascio and Montealegre, 2016; Pitafi et al., 2023).

The disruptive development of Mobile Web 2.0, or even Web 3.0 and Web 4.0, enabled various novel technologies, such as enterprise social networks (ESNs), ESM, and other collaboration platforms (Choroszewicz and Kay, 2020; Matthes et al., 2020). Among these technologies, ESM has grown rapidly in recent years because it facilitates cross-boundary interaction in distributed companies and enables new ways of communication (Davison et al., 2014; Gibbs et al., 2015). Meanwhile, various functions of ESM also provide many other benefits, such as knowledge sharing, innovation, and employee engagement (Yan et al., 2016; MacNiven, 2020). For instance, the ESM tool is posited to not only be an organisational driver of accumulating social capital but also a means of improving the JS of employees, especially in a collectivist context like China (Fu et al., 2019). In the context of different types of ESM implementation and employees' personal work goals, the effect of ESM on individuals' well-being and on an organisation are to be explored using the theory of job demands-resources (JD-R) (Wang et al., 2019; Liu et al., 2023).

### **1.2.2 Background of *DingTalk* in China**

According to the 52th research report published by the China Internet Network Information Center (CNNIC), there are 507 million online office users in China as of June 2023, accounting for 47.1% of the whole Internet users (CNNIC, 2023). Affected by the outbreak of a pandemic and other emergencies beginning from 2020, increasing demands of the online telecommuting industry accelerated the growth of ESM platforms and further expanded the digital transformation of enterprises. Originally, ESM applications and network resources were considered reactive emergency measure; however, with the development of cloud computing, big data, and other technologies, ESM has become a mostly proactive choice for organisations in view of costs in the current post-pandemic era (Huo et al., 2020). Manufacturers of instant messaging technologies, AR technology, and generative artificial intelligence are actively exploring new functions of software, accompanied by

business model continues to iterate. Development of ESM grows maturing that provide enterprises with integrated digital services from cloud to end users. *DingTalk*, Enterprise WeCom, LARK, Infocflow, WeLink, and LINGXI are the most commonly used office platforms and collaborative ESM applications in China (see Figure 1-1); the commercial giants supporting these platforms are Alibaba Cloud, Tencent WeChat, Byte Dance, Baidu, Huawei, and NetEase, respectively.

Figure 1-1. Six mainstream integrated ESM platforms in China



Among the mainstream ESM platforms, *DingTalk* and Enterprise WeChat, both are proven become vital supporting products in the digital industry and many Chinese tech firms (Mo and Yu, 2017; Song et al., 2019; Sun et al., 2020; Guo, 2023). It was reported that *DingTalk* ranked the 9<sup>th</sup> of top one hundred applications of 2020 downloads in App Store in China, which reflected the constantly growing speed of ESM product as an integral part of internal management of enterprises (199IT, 2021). According to a report by limedia (2020), the consulting analysts argued that during the pandemic, *DingTalk* ranked first in the ESM terminal users in 2020 with hundreds of millions of users, with a sequential increase of 73.8% monthly, and continues maintaining a stable growth trend. Hence, *DingTalk* was chosen as a specific example of ESM for this study because currently it is an influential enterprise communication and collaboration platform in China.

Supported by entire Alibaba Group, although only founded in 2014, *DingTalk* had been incorporated into nearly 25 million organisations and has 700 million users in various business industries in 2024, such as educational institutions, medical sector, automotive manufacturing, and new retail sectors (*DingTalk*, 2024).

Especially in the first half of 2020, and during anti-epidemic combat, *DingTalk* considered all levels of government as core participants. According to different

enterprises' requirements, *DingTalk* platform developed various digital solutions to them through online collaborative team. For example, it released official platform called prevention and control of COVID-19 including over 20 scenarios of work modules and met the special needs of local government in Hubei province; it provided "Internet hospital" and "Online medical consultation" for National Health Commission in Zhejiang province (Qinnan, et al., 2022). Thus, while employees of public institutions in China changed most of their routine office-based work to remote working via various online platforms, *DingTalk* platform fought its way out through "soft revolution" to the e-governance and huge popularity among Chinese government institutions and enterprises (Sun et al., 2020). Therefore, *DingTalk* was deployed on many public institutions' intranets and cloud disks, as well as via both mobile applications and websites, much more than in public health care centres and education systems (Wu, 2018; Qinnan et al., 2022).

### **1.2.3 Opportunities and Challenges of Using *DingTalk* in Public Sector in China**

The public sector in China generally contains three organisational categories that cover a variety of institutions, according to their business characteristics, internal operation, and scope of services (MBA Think Tank Encyclopedia, 2022). The first type of public organisations undertakes administrative functions decreed by state laws; the social public service pursue the realisation of public interests of a non-profit-making nature, such as education bureau, legislative body, judicial authority, and tax bureau. The second type is authorised by the state and allowed to engage in production and business activities, but they mainly provide social benefits and public welfare to the community, such as media groups, publishing houses, public hospitals, libraries, museums, and state banks. Parts of these social service agencies operate business in an enterprise style, but they do not primarily aim to make a profit. The third category refers to various state-owned enterprises, such as State Grid Corporation of China, China FAW Group, China Mobile, China Telecom, and Sinopec Corp. Although varying in their functions and structures, they are mostly funded by



the government; however, they are operated in an enterprise style, and aim to make a profit or an appreciation of state assets from public resources. They are supervised by management of a government authority.

All state-owned enterprises differ from private organisations; they have three distinct characteristics and responsibilities (Chen and Yan, 2020). Their first and most significant task is the social responsibility of servicing the public's well-being. Second, they are not only the main and leading forces in international market-oriented competition, but also build technological platforms for industrial innovations in China. Third, they aim to construct advanced corporate cultures integrated with socialist core values, such as empowering leadership, harmony, self-sacrifice, teamwork, and respect for people (Chen and Yan, 2020).

In order to understand *DingTalk* users in above three types of public institution and state-owned organisations, this phenomenological study selected representative employees from six institutions that covered each type of organisational category. Based on author's available resources, the six chosen institutions were the Tax bureau, China Media Group, public hospitals, state banks, China FAW Group, and China Telecom. The Tax bureau belongs to the first category of public sector; China Media Group, public hospitals, and state banks are in the second category of state-owned institutions; China FAW Group and China Telecom are state-owned enterprises.

The development of *DingTalk* can be divided into three stages, which are strategic exploration period from 2014 to 2016, developing period from 2016 to 2018 and maturity period of 2018 to 2020 (Qinnan, et al., 2022). In the strategic exploration and developing period, *DingTalk* platform initially focused on office digitisation of within and across enterprises. Then under the policy support from The State Council and the Ministry of Industry and Information Technology in 2016 (Xinhua News Agency, 2016; MIIT, 2016), *DingTalk* platform further promoted its application in social programs with educational sector, health service and social security system. So, it continually realised the intelligent integration of software and hardware, as well as organisational connectivity of the data ecosystem through its upgrading functions and

excellent marketing. Beginning from coronavirus outbreak in 2020, increasing demands of the online telecommuting industry accelerated the growth of *DingTalk* application. After the maturity period of 2020, *DingTalk* platform designed effective communication mode and personalised business mode for many public institutions. For example, it quickly customised a special digital solution for the government system of Zhejiang province in even 24 hours. Besides, it released official platform called prevention and control of COVID-19 including over 20 scenarios of work modules and met the special needs of local government in Hubei province. Moreover, many college and educational institutions has enhanced the effectiveness of online learning with *DingTalk* technology and outperform traditional teaching tools (Yukun and Zhonggen, 2023). Because of accumulated huge user base and excellent functions, *DingTalk* expanded its business footprint in public sector to the maximum and became an important part of the digital infrastructure over 20 provinces in China (Qinnan et al., 2022). After the pandemic, the use of *DingTalk* application has become an initiative of public sector, rather than an application for the sake of expediency during lockdowns and self-isolation.

As *DingTalk* supports all levels of government as core participants, and it has developed various digital solutions to them by outstanding performances on fast updating functions, and the advantages in resource coordination and multiple scenario management. For example, Song et al. (2019) examined the joint complementary effects of socialization-oriented SM (WeChat) and work-oriented SM (*DingTalk*) in a large financial company in China on team and employee performance; they found that *DingTalk* usage could positively influence team performance and support employees' work-related activities.

However, in practice, the differences of *DingTalk* users and public institutions will bring some challenges, or lead to less ideal outcomes. For instance, *DingTalk* created an online "simulated classroom" for students and teachers in education sector, which also required teachers to guide and train students in developing self-regulation learning ability. If they could not get sufficient technological support from the system, the goal of improving students' skills and effective learning could not be

achieved (Huining and Fengmei, 2021). Similarly, *DingTalk*-based online teaching combined with virtual experiment system provided new teaching strategies for students, while it imposes higher requirements on self-discipline and time management skills of the students. Simultaneously this system puts more demands on teachers' humanistic care and information technology literacy during the teaching process too (Hongxiang et al., 2022).

In other state-owned enterprises, the differences of understanding and mastering a new working management tool exist due to large number of employees within one organisation. From the technology acceptance model, it might be easier for young users to accept the new while harder for older employees, thus their attitudes will impact on practical operations of ESM tool (Wu, 2018).

Furthermore, many Chinese state-owned enterprises and public institutions have their own internal office automation (OA) systems and tools within the workplace environment, such as Yixin for China Mobile, customised Enterprise WeChat for Sichuan Press Group, and Lanxin for a public automotive manufacturing department. Many resources, work-related knowledge exchanges, and internal communications are comparatively private and collaborative tools, similar to Facebook Workplace and IBM Connections (Benitez et al., 2018). Some of these communication tools could not be connected to an external network. However, public services need to connect with external parties, and moreover, consider pursuing the public interest or common good with a culture of collective values and a commitment to altruistic work motives (Perry and Hondeghem, 2008). Thus, public employees in China need to do repetitive operations on both internal system and *DingTalk* platforms for public service uses. That might bring technology compatibility issues and work fatigue. Besides these challenges by the technology, public institutions of widespread adoption of *DingTalk* should not over-reliance on it as the only means of analysing human resources data. That might ignore other methods of evaluating human resources management, resulting in a lack of professionalism and objectivity.

Therefore, as a part of business management, *DingTalk* usage with its benefits and challenges requests new initiatives and key members to engage, support and train employees in their working practices.

### 1.2.4 Functions and Features of *DingTalk*

*DingTalk* is called an “All-in-one” workplace application and it integrates many function modules, which are instant messaging, document management, organisation contacts, meetings, and live. For instance, through contacts, *DingTalk* users can quickly find any other *DingTalk* users who share their working ID and networks on the platform, then facilitate reciprocal interactions instantly. Besides, the connections among users on ESM are all based on work-related professional activities, and a personnel directory of each employee likes an authenticated e-business card.

Although *DingTalk* has updated many functions in a high-speed growth, such as OA, DING, health code, voice, and video, upgrading from version 1.0 to version 7.0 during the last nine years (*DingTalk*, 2022; Qinnan, et al., 2022), its main functions contain three modules, listed in

-1.

Table 1-1. Main functions of *DingTalk* (source, Song et al., 2019)

Main Functions	Functional Description
Communication function	Similar to the application of QQ (an instant messaging software and web portal).
Message (with notification)	It can list all types of messages, and the status of receivers with “read” or “unread”.
<i>DingTalk</i> call	Free in-system phone call.
Group chat	Freely form internal and outside groups, such as competitors, suppliers, customers, and stakeholders.
Organisation/department chat	Present the structure of organisation/department, and label employees with names, positions, and department for internal communication.
Private chat	It can secret message which will be automatically deleted 30s after being read.
Video meeting	Make free multi-party video conference in groups.
<i>DingTalk</i> mail	It can integrate several email accounts.
Office Service Functions	Functional Description
Administrative approval	Request for leaves, working overtime, applications for business trips, use of official cars, seal and approval of contract and financial statement.

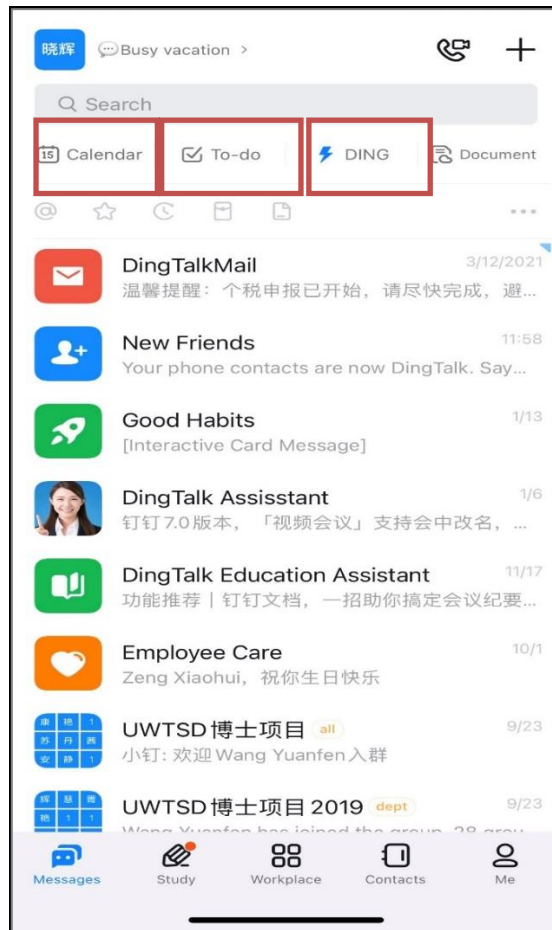
Main Functions	Functional Description
Log	Submit their daily and weekly work reports and it can generate the final report of individuals per year.
Dashboard	Allow real-time sign-in system, even remote clocking-in and out with GPS location.
Ding-drive	Personal drive or enterprise drive for uploading, online editing, searching, storing, and sharing files of all formats between mobile phones and computers.
Calendar	Follow up the work data at any time.
Announcement	Post organisational or departmental notifications.
Other Functions	Functional Description
Contacts	Allow users to add internal and external contacts
Employee care	Show birthday to all colleges and accept blessings.
Me	Provide Fitness record, Wallet, favourites, tags, and personal settings.
Live	Provide Live classes and knowledge training, sharing.

From an organisational perspective, a wealth of functions help *DingTalk* extend its strengths into five aspects (iResearch, 2021; Qinnan, et al., 2022):

- (1) efficient institutional management for large organisations, such as contact book for internal and external communication, “DING” function to keep co-workers’ rapport;
- (2) real-time sign-in and locating system, remote meetings; transparent workflows and collaborative channel of office work;
- (3) collaborations across different boundaries; personalised digital solutions for enterprises;
- (4) visualised digital services, and clear surveillance shifted from offline;
- (5) storage of information and knowledge sharing.

In order to explore the features of *DingTalk* further, the mobile interface of the application is shown in Figure 1-2.

Figure 1-2. Main interface of *DingTalk* on mobile phone



As shown in the main interface, three frequently used functions are Calendar, To-do list and DING assistant which show distinctive feature of *DingTalk*.

Calendar on the platform allows managers to check the attendance and log of employees at any time during working days.

To-do list can offer constant notifications of significance until the receiver completes the task, such as form filling, group announcements, and approvals.

Most notably, the “DING” function of *DingTalk* could give the receiver further reminder that improves internal communication efficiency and decreases the total execution cost. Assisted by unique function of “DING”, communication indicators, such as last seen, message delivery status, and free messaging notification, can be sent to a specific person via voice telephone, SMS, or APP messages. If the receiver has not installed *DingTalk* or does not have access to the Internet, then the receiver can also be informed through DING message.

Then the read-status of message from the receiver can be displayed and reported to the superior directly to check whether employees in group have read the urgent notification or not, with a clear label. That ensures the efficient interaction in task scheduling. If the receiver does not give speedy feedback to an urgent email or message, the sender can immediately escalate it into a conference call via function of “DING”. A “Bath Mode” of *DingTalk* can protect confidential sources and the message data, hide voice information and chat, even delete the chat records within 30 seconds (*DingTalk*, 2020; Mo and Yu, 2017; Wu, 2018).

To sum up, through deep interaction with enterprises, these novel features of *DingTalk* can not only help maintain awareness of conversations and increase users' control over communication (Song et al., 2019), but also integrates the general mobile office platform with personalised digital requirements of multiple scenarios, to better serve all kinds of organisations. Along with its constantly upgraded functions, *DingTalk* platform have emerged as a leading role in ESMs by unique features, and expanded its application to a variety of industries.

### **1.3 Research Gaps**

ESM, as an emerging communication tool, has been adopted in many organisations in recent decades; in Western enterprises, it has shown its efficiency in promoting JS, JP (Morris and Venkatesh, 2010; Alahmad et al., 2018; Fu et al., 2019), employee engagement, and knowledge sharing (Leonardi and Meyer, 2015; Kwahk and Park, 2016; Ahmed et al., 2019). A wealth of groundwork studies investigated the integrated concept of JS (Hoppock, 1935), the proposed numerous models of JS and JP (Judge et al., 2001; Aziri, 2011), as well as the associations between ESM and JS in Western enterprises (Moqbel et al., 2013; Braojos et al., 2019). Although the determinants of JS, such as working conditions, relation with co-workers, attitudes towards supervisor, and corporate promotion opportunities (Aziri, 2011; Çayak, 2021) are widely known, the association between influencing factors of JS and ESM usage is largely unclear for employees in developing countries.

Furthermore, Moqbel (2012) studied the relationships between the use intensity of

enterprise SNSs and the JS and JP of workers in two culturally different countries (i.e., the USA and Yemen). The findings revealed some variants and associations in two structural models that could be possibly explained by the diverse cultural dimensions, such as uncertainty avoidance in the workplace (Hofstede, 2001). Similarly, Oktosatrio (2019) argued that contextual and cultural differences have significant impacts on antecedents of JS and the relationship between JS and ESM usage. Therefore, there is inadequate discussion on the relationship between usage of a specified ESM tool and employees' JS in the context of China. In addition, empirical experiences of Chinese employees' JS during ESM use have been under-examined in extant studies. This is the first gap worth noting.

The leverage of ESM tools, such as Enterprise *WeChat* and *DingTalk*, benefits communication, collaboration, knowledge sharing, and innovation for Chinese corporate management and enterprise values (Ahmed et al., 2019). In line with the advantages, previous studies in this field mostly highlighted ESM as an excellent communication tool. However, besides benefits, some scholars are becoming concerned about the excessive use of ESM and its negative effects on individual overload, JS, and JP (Shepherd, 2011; Leonardi et al., 2013; Zheng, 2014; Yu et al., 2018; Wang et al., 2023). Excessive and problematic use of *DingTalk* will lead to personal and social problems such as technostress, reduced productivity, information overload, work life conflict (Ragu-Nathan et al., 2008; Ayyagari et al., 2011; Yu et al., 2018; Pitafi et al., 2023), and inhibited work performance (Moqbel and Kock, 2018; Matthes et al., 2020). Despite this, there are more speculations about the benefits of ESM than about specific evidence of risks; in any case, there is inadequate evidence of the challenges and negative impacts of ESM to individuals and organisations in existing ESM research (Chu, 2020). In particular, the dark side of *DingTalk* is under-explored in the specific organisational context of China, such as its problematic usage and negative work-related consequences. Moreover, although there are some studies on the implications of *DingTalk* usage in educational institutions (Sun, 2018), there is limited evidence and knowledge of the specific role of *DingTalk* in the context of the public sector in China. Therefore, inadequate exploration of the bilateral



influences of the *DingTalk* phenomenon on individuals' JS and behaviours in the public sector in China is the second gap worth noting.

Additionally, the main difficulty in measuring employees' JS is a lack of criteria. For instance, the links between attitudes and behaviours are complex; it is difficult to infer attitudes from behaviour with any validity and behaviour is not always a valid expression of an attitude (Oppenheim, 1992). Several well-known scales (Ironson et al., 1989), such as the Minnesota Satisfaction Questionnaire (MSQ) (Weiss et al., 1977), Job Descriptive Index (JDI) (Smith et al., 1969), Job Diagnostic Survey (JDS) (Hackman and Oldham, 1974), and Job Satisfaction Survey with nine-subscale measures (Spector, 1985), have been used as measurements of the JS of Western employees in research. However, these known attitudinal characteristics cannot be directly considered valid or as a standard for Chinese peers (Fang et al., 2020).

From the targeted population of data collection for JS measurement, previous research scholars relied on college student data (North, 2010; Leonardi et al., 2013) and concentrated their studies on higher education (Yao et al., 2018; Zhang et al., 2020; Edwards, 2019) or employees in industrial organisations (Alahmad et al., 2018). When *DingTalk* is taken as an empirical example, these findings from distinct fields could generate external validity problems if the results were simply referenced to Chinese public workers. Therefore, how to combine the influencing effect of the *DingTalk* tool with different views of JS in public institutions in China into one conceptual framework has not yet been investigated (Song et al., 2019). This is the third gap worth noting.

Moreover, the existing management literature shows a lack of attention to the changing relationships and emerging processes of interaction between novel technologies and organisations. According to statistics from leading management journals, from 1997 to 2006, less than 5% of technology articles addressed the role and influence of technology in organisations (Orlikowski and Scott, 2008). According to their findings, a singular definition of technology in extant literature is inherently problematic. In essence, since technology and humans could be considered equally within a heterogenous network, it is important to shed light on the material constraints

and affordances of the technology itself (Leonardi, 2011, Pitafi et al., 2023). Thus, how to bring the technology affordances of *DingTalk* into organisational study, and examine the disruptive effects and interactive relationships in the work system in the context of China is another research gap.

Therefore, the focus of the current work is to address those gaps in the existing literature, to make theoretical contributions in the OB field, conduct methodological research, and provide practical value.

#### **1.4 Rationale of the Study**

*DingTalk* has been considered both a novel technological tool and a prevailing phenomenon in Chinese private sector organisations and public institutions in the past decade. For instance, *DingTalk* was used in over 5 million Chinese enterprises and had over 200 million users in 2020 (Sun et al., 2020). Initially, many public organisations in China adopted *DingTalk* out of expediency; then, due to its outstanding performance, it was regarded as an excellent technological tool for individuals and a requisite instrument for entire organisations (Song et al., 2019). The technology is useful to explore the surge in the new employment mode of online collaborative office during the digital transformation of enterprises. An online collaborative office was particularly useful during the pandemic context of 2020, because enterprises relied on online office platforms for work and production; at the time of the pandemic, the daily activity of *DingTalk* users continued to grow during the working day (Iimedia, 2022). With the support of *DingTalk*, co-workers and leaders collaborated via online communications more frequently and flexibly, which enabled them to modify routine work activities and adapt to the new technological environment (Mo and Yu, 2017).

As ESM technology becomes increasingly used, individuals are likely to rely on it and could spend excessive time and energy on it. The overuse of ESM can lead workplace issues and negative technostress, such as overload, groupthink, and privacy invasion (Yu et al., 2018; Sun et al., 2019), which result in undesirable OB.

Hence, the excessive and problematic use of ESM in the workplace deserves more attentions from scholars (Yu et al., 2018; Wang et al., 2023).

Furthermore, taking *DingTalk* as an ESM example, many employees in the public sector in China had to quarantine at home and telework during the pandemic. However, there are relatively few research studies on the impacts of *DingTalk* adoption on employees' working attitudes in the public sector (Moore, 2017; Demircioglu, 2018; Fang et al., 2020) or in state-owned enterprises of China (Chen, 2016; Ding, 2019a). Accordingly, problematic usage of *DingTalk* will lead to negative implications such as job burnout, turnover, and job dis-satisfaction generated in workplace (Ragu-Nathan et al., 2008; Ayyagari et al., 2011; North, 2010; Peng et al., 2016; Sun et al., 2019).

Therefore, firstly, this study provides multiple perspectives of *DingTalk* practitioners to understand the phenomenon, and propose strategic suggestions to handle these controversial challenges and issues.

Secondly, since most traditional researches of social media usage were limited to case studies (Alahmad et al., 2018; Gibbs et al., 2015) and employees' JS evaluation were mostly found in quantitative researches (Steijn and Voet, 2017; Liu and Bakici, 2019; Pitafi et al., 2020), it rarely explores a phenomenon of interest using mixed methods. As this study also values practical solutions and consequences in specific contexts, it is possible to integrate a qualitative method with a quantitative method to address the research questions, to distinguish respondents' diverse experiences, interpret the world in multiple ways and advance future research (Cassell et al., 2018).

In addition, several well-known scales of JS evaluation, such as the MSQ (Weiss et al., 1977), JDI (Smith et al., 1969), JDS (Hackman and Oldham, 1974), and Job Satisfaction survey with nine-subscale measure (Spector, 1985), used to assess known attitudinal characteristics of Western employees in extant studies will be localised in a realistic Chinese institutional context for participants from the public sector in this study.

Thus, the approach to address the research gap is to develop a localised and

appropriate questionnaire with validated scales. For instance, Chen (2016) localised the classic measurements of innovative performance for a study with Hebei-based (a Chinese province) government employees, which was based on organisational climate theory, task interdependence, and perceived usefulness. Fu et al. (2019) explored the impact of different ESM usage patterns on JS with the mediating effect of workplace social capital. They adopted measurements from previously validated constructs with some modifications to fit practical state organisations and Chinese ESM users. Hence, the role of *DingTalk* implementation and its impacts on the JS of employees in China, and the use of classic JS measures with Chinese contextual settings, need to be fully considered.

Thirdly, ESM brings about individual and organisational changes through communicative interactions between an organisational context and a technology's functionality. In order to understand changing technological effects in the workplace, Orlikowski and Scott (2008) shed light on sociomateriality utilising actor-network theory (ANT). They argued that the relations and boundaries between humans and technologies are not fixed, but intersect and evolve together over time. Leonardi and Barley (2008) proposed that the concepts of materiality and affordance are essential to explaining sociomateriality in the dynamic process of organising. Built on the perspective of technology affordance (Faraj and Azad, 2012), Majchrzak et al. (2013) identified the technology affordances of ESM as a promising means of analysing and researching organisational literature. Furthermore, Sun et al. (2020) proposed a research model that confirms the significant impact of ESM affordances on employees' creative performance from the perspective of knowledge transfer. Similar findings were referred from Pitafi et al. (2023) and Shang et al. (2023). Therefore, this study aims to shed light on the shift in the nature of work activities, and reconstruct the relationships between transformative *DingTalk* technology and evolving working behaviour in a framework through the lens of sociomateriality. In addition, as in this study, social constructivism and its theoretical stance can best explain the research problem of *DingTalk* phenomenon. Thus, this study provides an interpretivist ontological worldview that takes into account interpretations of the

“multiple realities” of those who work in organisations through their diverse behavioural patterns and human psychology (Golafshani, 2003). That is, the epistemological stance of social constructivism in this research will help to identify the complex impacts of *DingTalk* technology on public employees and the different perceptions incorporated in various groups, and then to construct an understanding of cases (Holstein and Gubrium, 2007).

To sum up, the rationale of this thesis is outlined in the following four aspects.

Firstly, there is a paucity of empirical exploration of the JS of *DingTalk* users within Chinese state-owned and public institutions in the current literatures; so, a gap is bridged in Chinese OB research by empirically investigating the relation between employees’ JS and *DingTalk* technology adoption. This study is also helpful to understand the controversial impacts of *DingTalk* on individuals in public sector in China.

Secondly, when evaluating the JS of public employees using organisational theory, this study uses mixed methods and is always guided by a social constructivism stance. Since existing measures and scales are not the most appropriate for emerging *DingTalk* technology and the target Chinese audience, the current study conducted a localised inquiry into the phenomenon and developed a questionnaire of validated scales.

Thirdly, from the perspective of the technological affordance of *DingTalk* and the theory of sociomateriality, this study aims to provide a theoretical contribution to explore *DingTalk* enactment in OB research in the context of China. Leonardi and Barley (2008) argued that technologies could occasion different outcomes in different social contexts via material constraints and technology affordances. Therefore, a concrete framework with significant associations between the technology affordances of *DingTalk* and the JS of public sector employees in China will be constructed from the perspective of sociomateriality and JD-R theory.

Six state-owned enterprises and institutions in the public sector in China of current study were chosen as: Tax bureau, China Media Group, state banks, public hospitals, China FAW Group, and China Telecom Operators. These state-owned

organisations are selected because they are significantly representative ones in each category of public sector, which have been affected by disruptive digital technology. Besides, the majority of them is known to adopt *DingTalk* as an internal prevailing working tool in some departments. Last, but not least, from the perspective of practical management, the implications of ESM technology usage in the context of the public sector in China need to be understood to improve the JS of employees and prompt productive work behaviours during *DingTalk* usage.

### **1.5 Research Questions**

As a new technological phenomenon, ESM tool adoption in business organisations brings new opportunities and challenges to the OB research field (Liu and Bakici, 2019; Matthes et al., 2020; Pitafi et al., 2023; Shang et al., 2023). The implementation of *DingTalk* in Chinese organisations can affect the overall JS of individuals and influence the productivity of organisations through perceptions of social capital (Fu et al., 2019; Bai and Yan, 2023). Therefore, the current study would like to understand the essence behind controversial influences of using *DingTalk* by conducting interviews and online surveys in some Chinese state-owned and public institutions. Moreover, as JS is considered an indicator of employee behaviours in the workplace (Robbins and Judge, 2017), empirical evidence and its implications could help solve technological issues in human resource management to enhance the overall JS and JP of *DingTalk* practitioners.

Despite an abundance of different definitions of JS in the literature (Aziri, 2011), many factors of JS are common to many studies, such as working conditions, organisational opportunities, supervision, communication, co-workers, rewards, and corporate culture. Furthermore, reviews of JS factors post-advances in ICT have found some new JS factors, such as autonomy and training (Jung and Suh, 2019). The positive contribution to JS by ESM usage has also been confirmed in many studies, including transforming communication among co-workers (Alahmad et al., 2018; Pitafi et al., 2020), changing organisational structure (Leonardi et al., 2013), changing culture (Gibbs et al., 2015), promoting knowledge sharing (Sun et al.,

2019), increasing creative performance (Sun et al., 2020), and improving the engagement and agility of employees (Cai et al., 2018; Liu and Bakici, 2019; Pitafi et al., 2023). To sum up, the current study seeks to find out whether the major determinants of JS are all related to ESM usage, besides those known factors in extant literature. In addition, this study aims to identify the relevant associations between antecedents of JS and ESM use, and clarify their research scopes regarding individual, technological, cultural factors, and corporate context, in the chosen Chinese organisations.

Accordingly, the specific research questions of this study are:

- How does the *DingTalk* phenomenon affect the JS and JP of public employees in Chinese state institutions?
- To what extent the specific factors are affecting the JS of *DingTalk* users in the public institutions in China?
- What significant determinants moderate and influence the JS of *DingTalk* users in the public institutions in China?
- How can *DingTalk* usage prompt constructive impacts on employees of the public sector in China by work practices?

The answers to these research questions can provide a more holistic perspective of the *DingTalk* phenomenon in the public sector context of China. This study develops a novel framework that links ESM usage with JS and JP in organisational research, and sheds some light on strategic guidelines for the appropriate deployment of *DingTalk*.

## **1.6 Research Aim and Objectives**

The aim of this research is to explore the influence of ESM *DingTalk* usage on employees' JS and behaviours in the context of Chinese state-owned enterprises and government institutions. In relation to the benefits and challenges of the effect of *DingTalk* usage on individuals' JS, this study contributes to the literature by developing an empirical model to explain the relations among specific technology, human attitudes, and organisational contexts from the perspective of sociomateriality.

Some extant literature gives various categories of antecedent variables for JS and ESM-mediated interactions in organisations (Brown and Peterson, 1993), and some provide a comprehensive analysis of various JS models and influencing factors (Spector, 1997; Aziri, 2011; Robbins and Judge, 2017). As a technical support, *DingTalk* plays a significant role in influencing workers' emotions, attitudes, and activities (Song et al., 2019; Sun et al., 2020; Wu, 2018). However, some factors and their associations tend to be irrelevant and fragmented for the *DingTalk* phenomenon in this study.

Thus, four objectives are proposed to support the research aims and they are described in next paragraphs.

The first objective of this study is to explore how the prevailing *DingTalk* tool influences JS and JP of employees in public sector in China. In particular, in view of the trend of *DingTalk* implementation in these state-owned organisations, this study focuses on the constructive and destructive impacts of its implementation on the attitudinal and behavioural outcomes of *DingTalk* users.

Many primary determinants of JS are identified in extant researches, such as: organisational support (e.g., job conditions, task features, supervisor support, organisational recognitions), individual personality characteristics (e.g., self-efficacy, learning capability, creativity), and corporate culture traits (e.g., public service motivation (PSM), self-sacrifice for institution).

The second objective is to identify the roles of significant determinants of JS, and the relations between *DingTalk* use and JS in this study. Thus, it does not only investigate what are the significant influencing factors, but also explores the extent to which the underlying factors transform public employees' attitude and behaviour in *DingTalk* context.

The third objective of this thesis is to contribute a concrete conceptual framework to explain a whole picture of *DingTalk* phenomenon, and reflect the relationships between *DingTalk* usage and JS, any other moderators, which differs from the traditional theoretical frameworks. The framework reveals the interactive essence of the technology affordances of *DingTalk* and changes in human psychology towards



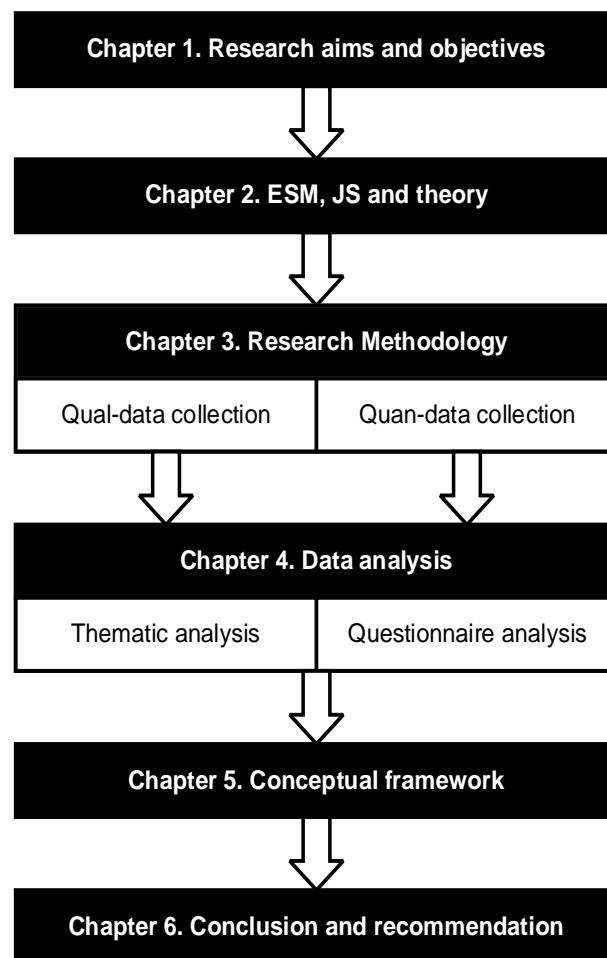
job attitude in the public sector of current study, from the perspective of sociomateriality theory.

Furthermore, fourthly, some relevant suggestions, principles, and practical implications are proposed on the strategic utilisation of *DingTalk* to enhance constructive JP and JS of employees, especially within public organisational settings of China.

### 1.7 Thesis Structure

This thesis consists of six chapters and the following flowchart (Figure 1-3) illustrates the overall research.

Figure 1-3. Research flowchart



Chapter 1 of this thesis describes the background to *DingTalk* technology. It then discusses the development history of ESM tool *DingTalk* and prevalent phenomenon in public sector in China. Then considering the features of *DingTalk* usage in the

work and the controversial issues by technological changes, this research aims to discuss positive and negative impacts on individuals and organisations in public agencies. This study aims to fill some gaps in extant literatures by exploring significant relations among technology, users' working attitude, and organisational contexts.

Chapter 2 studies the relevant literature and clarifies such notable concepts as SM, ESM, and related themes in organisational research, such as JS, its theoretical antecedents, and JP. As regard to the existing literature of recent decades, many studies related to the benefits and challenges of ESM are critically discussed within different cultural contexts and working situations. Additionally, the theory of sociomateriality is introduced to explore the relations and boundaries between humans and technologies in work practices through the interactions of technology affordances.

Chapter 3 undertakes mixed methods of a sequential exploratory design to investigate *DingTalk* phenomenon. The research methods primarily employ qualitative methods and an induction strategy. Initially, qualitative data are collected from semi-structured in-depth interviews, and then specific variables and quantitative measures for JS related to *DingTalk* are identified. Base on the categorised codes and primary themes, a questionnaire is designed for participants in chosen groups. After expert consultations, pilot study and online survey, over four hundred responses and open-ended answers through semi-structured questionnaire are collected from participants. The researcher's reflexivity and ethical considerations are highlighted from a social constructionist stance. To sum up, mixed methods with social constructionist interpretation are chosen as the best way to understand the *DingTalk* phenomenon and relationships between individuals' JS and evolving ESM management in organisational research.

Chapter 4 respectively describes the process of data analysis from both interview and questionnaire in detail. Firstly, thematic analysis identified five major themes from interviews with 25 representative participants of different grade levels of staff. Secondly, based on the themes and relationships as an initial conceptual model,

quantitative analysis of questionnaire can provide an instrument for significant extent in this study. So, survey of over 400 participants provided a supplementary interpretation to the empirical research in terms of demographic information, factor analysis, and modelling statistical tests. Meanwhile, results of online survey are to confirm relational hypotheses regarding the causal link between various constructs and *DingTalk* users' working attitudes. After reliability and validity of collected data verified, new findings are examined, comparing existing literatures and qualitative inquiry result.

Chapter 5 develops a final conceptual framework from the data analysis and findings of Chapter 4, and addresses how and what factors significantly contribute to the JS of *DingTalk* users in context of Chinese state-owned enterprises and institutions. It also discusses the significant relations between technology affordances of *DingTalk* and JS, as well as the effects of some moderators in *DingTalk* phenomenon.

The last chapter of the thesis reveals various perspectives from individuals, leaders, and organisations, and outlines the theoretical and practical implications of using *DingTalk* technology in public institutions of current research. Furthermore, limitations of the thesis and future research opportunities are discussed.

## **1.8 Summary**

In this chapter, a brief introduction of ESM and research background of *DingTalk* in China have been provided firstly, and then the overall enquiry is illustrated. On the one hand, the prevailing usage of *DingTalk* can help employees improve work efficacy and organisations achieve better JP; on the other hand, functional constraints of the tool have aroused controversial concerns about individuals' psychological and attitudinal outcomes. Hence, this research aims to understand *DingTalk* phenomenon in the context of Chinese state-owned and public institutions, especially negative and positive influences on participants during using the tool. Furthermore, there is lack of a conceptual framework to empirically investigate significant relations among *DingTalk's* technology affordances, employees' characteristics, and Chinese public context, as well as from the theory of

sociomateriality and JD-R. Based on the research gaps, corresponding research questions and objectives are proposed. Therefore, an empirical exploration of the *DingTalk* phenomenon in public sector in China is to address four gaps in the study, and to contribute practical and theoretical values to organisational ESM management field.

## Chapter 2. Literature Review

### 2.1 Introduction

The foregoing chapter presented the foundational work of this research. It examined the rationale of the thesis, and explored the aims and objectives, which were preceded by the statement of research background, identification of gaps, and questions in extent literatures.

This chapter presents a systematic literature overview of following concepts: the definitions and development of SM, ESM, technology affordances of ESM, JS, and JP; then it examines the causal relationship between ESM usage and employee's JS from literatures along with timeline. Since SM was established earlier than ESM in the digital era, the concept of SM is introduced before that of ESM technology. After discussing the taxonomy and affordances of ESM, controversial concerns about positive and negative effects of ESM on individuals and organisations are sorted out. However, a wide variety of literatures on different antecedents of ESM users' JS are found dispersive and most publications aimed at ESM practitioners' perception in Western countries. According to our research objectives, based on these connections, the presumed factors of ESM practitioners' JS are interpreted and explored further in follow-up chapter from four aspects: job and individual characteristics, corporate culture and organisational support.

Therefore, through taking *DingTalk* as a typical representative of ESM, this study aims to empirically explore its positive and negative influences on individuals' JS measurement in the public institutions of China. The new understanding of the *DingTalk* phenomenon can be incorporated in a theoretical framework and explained from perspectives of technology affordances, JD-R theory, and PSM in Chinese OB research.

### 2.2 Conceptual Clarification: SM

The fourth industrial revolution brought "connection" everywhere and with everything; thus, varying changes happened in society, leading to dynamic, diverse, virtual, and

boundary-less transformation in business and research landscapes. The growing availability of high-speed Internet led to the creation of various SNSs, such as My space, Facebook, LinkedIn, Harmony, and Town Square, in Western countries at the beginning of the 21st century. A similar situation emerged in China from the mid-1990s; the infancy of the Chinese mobile social network took place during the years between 2000 and 2005. During that period, the most representative SNSs were Kaixin001, Renren.com and ChinaRen, which relied heavily on PCs. Then, after a few years of development of 3G, 4G network convergence, and smartphones, Tencent's *WeChat*, instant software QQ, and Sina 's Weibo became platform-level products that lead the way in the field of mobile social networking (Wu, 2018).

According to Boyd and Ellison (2007, p.211), a widespread definition of SNSs is: “the web-based services that allow individuals to construct a public or semi-public profile within a bounded system, connect a list of other users, and then traverse their list of connections”. These sites provide general functions including instant messaging, chat rooms, email, blogging, file sharing, and discussion groups. SNSs vary and they enable diverse end-users to communicate with distinct dialogues. The nature and nomenclature of these connections may vary from site to site (Boyd and Ellison, 2007). Thus, SNSs incorporate IT and can be primarily classified into the following two types (Rooksby et al., 2009). One is internal SNS, which is owned by a large organisation for their employees' communication within the enterprise as an internal SM platform. Internal SNSs differ from general in-house intranets; the internal version of a special purpose SM is often developed by external providers who offer a private SNS and professional services on their servers, such as D Street at Deloitte, WaterCooler at Hewlett Packard, and Beehive at IBM (Rooksby et al., 2009). Most SNSs support mostly pre-existing social relationships in large organisations, whereas some provide “weak ties” in offline connections. The study of Choi (2006, p. 181) found that 85% of respondents “listed the maintenance and reinforcement of pre-existing social networks as their main motive for Cyworld use”. SNSs were argued to help enhance the weak ties within a firm, then highly benefit the business (McAfee, 2006). The other type is public SNSs, which are run by commercial providers, such

as Facebook, YouTube, and LinkedIn, for organisational communicating with external parties. They can help strangers to interact with each other; they attract their own populations based on shared interests and specific demographics. Public SNSs provide users with options to display their networks in public, and a mechanism to send private messages or to broadcast messages or comments (Boyd and Ellison, 2007).

SNSs can cause organisational frameworks to become online communities, which enhance a sense of community and life satisfaction for different groups of people (Oh et al., 2014). SNSs in this context are used for a mix of work-related and leisure-related activities. Deployed by the Web 2.0 platform and software, the “user-generated communication” of SNSs in B2B e-commerce represents a prevalent marketing tool to support the creation of brand communities and achieve brand objectives (Michaelidou et al., 2011; Helal and Ozuem, 2019).

Although SNS and SM are usually used interchangeably, the two concepts have practical differences in scope. SM often includes numerous applications and services, among which are SNSs, which refer to sharing platforms with broader networks that cover sharing media, such as blogs/vlogs, podcasts, wikis, and game modding (Collin et al., 2011). Safko (2012, p. 5) categorised SNSs as one type of 15 SM categories and defined SM as “a new set of tools, new technology that allows us to more efficiently connect and build relationships with our customers and prospects”. One definition of SM has been adopted in a variety of studies; this definition of SM is “a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0 and that allow the creation and exchange of user-generated content” (Kaplan and Haenlein, 2010, p. 61). With the evolutionary trend of communication technology, such as updating from Web 2.0 (a way of utilising the World Wide Web from 2004) to mobile devices, applications of SM are no longer limited to desktop PCs and laptops (Kaplan and Haenlein, 2010). As different types of SM enjoyed a remarkable popularity surge based on Mobile Web 2.0, or even Web 3.0 and Web 4.0, new means of communication were created that exceeded the scope of earlier definitions of SM (Looy, 2016).

Due to a wide range of disruptive technologies and SM services of all sorts, there are some definitional challenges. Through categorising SM into seven similar functional blocks, which are identity, conversation, sharing, presence, relationships, reputation, and groups, Kietzmann et al. (2011) offered a honeycomb framework and another definition to understand the different SM platforms. SM includes highly interactive platforms, which changed with mobile-based and web-based technologies, that facilitate the creation or sharing of information, ideas, career interests, and various activities via virtual communities and individuals' networks.

Based on the five characteristics of SM proposed by Looy (2016), the generic features of SM are depicted as following: (1) sharing participation, (2) openness of free-flow of information, (3) conversation generated from users' shared content, (4) interactive community, and (5) connectedness between network users.

Moreover, Kane et al. (2014) similarly emphasised four essential features of SM networks, with an updated definition, which are: digital profile, searching and privacy, relational ties, and network transparency. Furthermore, they referred to SM as "networks" rather than "sites", because the extension feature of platforms goes beyond the confines of a website, offering additional communication and interaction (Hong et al., 2023). Likewise, some commonalities in features are synthesised as following (Obar and Wildman, 2015):

- 1) SM are interactive Web 2.0 Internet-based applications.
- 2) User-generated content such as digital pictures or videos, and text posts generated through all online interactions, is the lifeblood of SM.
- 3) Users create service-specific profiles for a website or app that are designed and maintained by the SM service.
- 4) SM facilitates the development of online social networks by connecting a user's profile with those of other individuals or groups.

All these features facilitate the common technology affordances of SM, and contribute the strengths and risks when using the technology in the workplace.

Currently, networks with diverse users and functionality can be cultivated on SM based on different technical features. For instance, the Chinese instant messaging



service, QQ, and *WeChat* and *DingTalk* have all become relevant enterprise tools in major organisations in China during the past decade. Hong et al. (2023) suggested that combination of enterprise SM (*DingTalk*) and public SM (*WeChat*) is imperative to facilitate the development of digital relationship formation in workplace. Each of these tools differentiates itself in terms of some technological functions, offering affordances and user bases, and they cannot be substituted for each other.

To sum up, it is hard to draw a precise conceptualization of SM on account of the various definitions and constantly evolving technologies. When a wide range of SM applications are adopted in different contexts, it is better to incorporate their functionality into a particular context of research.

### **2.3 Conceptual Clarification: ESM**

When Enterprise 2.0 technologies emerged within companies, there were many challenges and concerns about how to use the tools for collaborative and knowledge-facilitated work (McAfee, 2006), because, until the past decade, work-oriented SM in business activities had become the trend. Fraser and Dutta (2008) argued that social networking tools in a work environment have shown overarching advantages such as improving morale, changing hierarchy to collaboration, and increasing organisational productivity. Not only can SM facilitate problem-solving and collective intelligence (Vuori and Väisänen, 2009), in the form of networked professional conversations, instant connections, and collaborative dialogues among co-workers, it also has the capability of revitalising organisational culture. Ongoing appropriate use of SM in enterprises could facilitate more efficient ways of working, provide professional dialogues for communication in work-related groups, enable the participation of employees, and expand brand reputation (Bennett et al., 2010).

Based on media synchronicity and social capital theories, Cao et al. (2012) investigated the mechanism of employees creating value at work; they argued that SM could promote JP through implicit knowledge transfer in task-related production communication. Besides, many research studies indicated that the use of SM for work yielded both hedonic and utilitarian value to employees and led to better agility

performance through knowledge sharing and trust enhancement (Leftheriotis and Giannakos, 2014; Cai et al., 2018; Ahmed et al., 2019). Depending on the roles that SM plays within organisations, Leonardi et al. (2013) classified ESMs into three broad metaphors: leaky pipe, echo chamber, and social lubricant; this was similarly underlined in Leonardi and Meyer (2015).

Leonardi et al. (2013, p. 2) defined the formal concept of ESM as a web-based platform: (1) that allows workers to deliver private messages or broadcast messages in the organisation; (2) that allows workers to build relationships through communication with co-workers; (3) that allows workers to edit and keep records of related documents and profiles; and (4) on which messages, texts, and profiles of business activities, connections, and communication can be reviewed and edited by anyone in the organisation at any time.

Furthermore, SM in the workplace is heterogeneous due to enterprise adoption and personal usage, which can be divided into two categories: work-oriented SM and socialization-oriented SM (Song et al., 2019). Work-oriented SM, such as *DingTalk*, Facebook Workplace, and IBM Connections, is comparatively private; it facilitates the creation of resources, and enables the exchange of work-related knowledge in terms of internal communications within the workplace environment (Benitez et al., 2018). According to Song et al. (2019), work-oriented SM is generally designed with more technological features to afford and enhance efficiency in communication and collaboration. For example, most work-oriented SM can provide users with compulsory notifications and remind them to respond to task-related messages. In other words, various media tools such as chat applications, audio/video conference programs, online communities, and feedback systems are gradually integrated into one ESM for business use. By contrast, socialization-oriented SM focuses on the exchange of social and personal information and facilitates informal and expressive ties more flexibly than work-oriented SM. And the author furtherly underlined that joint use of multiple social media technologies could increase levels of employee satisfaction. For example, Braojos et al. (2019) examined the complementary roles of SM and e-commerce, and argued that integration of these two capabilities can

promote customers' engagement and improve a firm's performance. However, Liu and Bakici (2019) discussed the moderating role of employees' public SM experience on the adoption of ESM and indicated that their experiences might have a negative impact on attempts at information seeking during organisational entry. Song et al. (2019) examined the joint complementary effects of socialization-oriented (*WeChat*) and work-oriented SM (*DingTalk*) in a large financial company in China on team and employee performance, and found *DingTalk* usage could positively influence team performance and support employees' work-related activities. Thus, in this study, only *DingTalk* was chosen as a representative work-oriented tool from various types of ESM tools, which to be explore in public sector in China.

Although research about ESM is emerging and attracting considerable attention, theoretical and empirical studies examining the impact of SM usage in the context of enterprises are still at an early stage (Leonardi et al., 2013; Ahmed et al., 2019; Guo, 2023). Some contemporary research focused on technology adoption in a non-organisational or social context, and targeted populations of youth, students, and customers (Jarrahi, 2011; Yao et al., 2018). For instance, Guo (2023) also highlighted the benefits of corporate WeChat in promoting innovative behaviours of employees irrespective of their gender or educational background. Therefore, as a new and significant technological tool influencing individuals' OBs, and internal enterprise management within workplaces, investigations into the positive and negative implications of ESMs remain significantly inadequate for various types of organisations.

### **2.3.1 Taxonomy of ESM**

As an emergent phenomenon in business, research into whether work-oriented usage of ESM enables or constrains employees' satisfaction and individual outcomes is in its infancy; while the implications and roles of ESMs with respect to specific dimensions of technology outcomes remain unclear. During the last two decades, it is well known that ESM has helped stimulate workers' creative thinking, inspired digital

creativity in the workplace, and had a moderating effect on organisational agility (Chung et al., 2015; Si et al., 2023). However, the different impacts of internal and external factors of ESM usage, and other dimensions of the technological tool associated with employee JP are still unclear and need to be explored. Although Chen (2016) systematically investigated the influencing mechanism of SM on public employees' innovative performance and behaviours, based on organisational climate theory, Chen (2016) did not reveal the negative influences of ESM use on individuals or on an organisation. Kwon and Wen (2010) differentiated various roles of ESN into task-oriented and relationship-oriented ESN, and extended the TAM model in relation to using the tool. Liu et al. (2014) explored the different influences of ESN on the team performance and the knowledge coordination process of Chinese employees. Chen (2017) grouped ESM research into three streams. The first stream in prior research focused on the linkage between individual working behaviours, performance, and ESM adoption from the viewpoint of social capital theory. The second research stream investigated knowledge seeking and sharing regarding ESM utilisation, and the rationale behind it as well. The third stream mainly indicated that ESM tool is a communication and collaboration platform that supported the organisations.

Kane et al. (2014) suggested that researchers should focus on the organisational implications of SM with careful consideration of the features of these technologies and their impacts on the applied field. Alahmad et al. (2018) shed light on the impact of ESM identity on JS and JP through the mediation of co-worker support, albeit those other features of ESM related to organisational structure needed to be taken into consideration as well. However, in contrast, Trusson et al. (2018) proposed that quality of JP and employee autonomy might be degraded by managerial control logic through an ICT tool in some situations. From a managerial perspective, the technical features of ESM are designed by platform developers, which offer a variety of functions and applications to workers. Therefore, Song et al. (2019) argued that the heterogeneity of ESM could be understood from three dimensions: different technical features, affordances, and supported ties.

### 2.3.2 Technology Affordances of ESM

Gibson (1977) introduced the bridging concept of affordances; later, it became an analytic lens in distinguished properties of objectives. The material properties of a technology, which are composed of physical qualities such as colour, texture, composition, size, shape and features of elasticity, rigidity, and mobility, are common to each person, but the affordances of that artifact are unique to a person who pays attention to it in a particular way (Gibson, 1977, p. 134). Thus, affordance refers to a combination of distinguishing features of an object through which people can perceive the value and meaning of the thing to themselves, then react to their situations.

Norman (1999) suggested that affordances are intrinsic properties of artifacts, and that the role of affordance is easy and visible to the users regarding what the technology can do and how. In Norman's view, the word "affordance" can be replaced with the phrase "perceived affordance" from the perspective of physical products design. Norman's view differs from that of Gibson; Norman argued that designers can invent new real and perceived affordances, and a technology's affordances do not change across different contexts of users' actions on material property. Then Hutchby (2001) proposed that, materiality can be independent of people, whereas affordances are constituted in the relationships between people and the materiality of the technology, which people perceive as possibility and take action to achieve their goal. Zammuto et al. (2007) introduced "affordances" for the organising process of how the materiality of IT and organisation features enact together.

Based on previous relational views, Markus and Silver (2008) defined technology affordances as "the possibilities for goal-oriented action afforded to specific user groups by technical objects" (p. 622). Thus, an affordance is considered primarily as a relationship between a specified user group and a technological object, which indicates the way to analyse users' goals and capabilities in relation to IT artifacts.

Moreover, the technology affordances of ESM are designed to empower workers to generate content in an organisation, to facilitate the actions and opportunities that emerge from a focal technology (Faraj and Azad, 2012, p. 240), and to provide access to a large network of heterogeneous contacts. Through four basic affordances of ESM (persistence, visibility, association, and editability), some OBs, such as knowledge sharing, communicative actions, and power processes of employees, can be facilitated through technology's functionality (Treem and Leonardi, 2012; Leonardi et al., 2013).

In contrast to general affordances, four affordances of SM (metavoicing, triggered attending, network-informed associating, and generative role-taking) play vital role in engaging workers in knowledge sharing conversations in the workplace (Majchrzak et al., 2013; Yan et al., 2016). Furtherly, the authors identified the positive and negative effects of different mechanisms acting on technology affordance for productive knowledge conversation. Additionally, Gibbs et al. (2013) found that the affordances of SM not only increase positive impacts on knowledge sharing, but also create dialectical tensions for workers in a technological organisation. These understandings of affordances offer novel views of the strategic management of ESM usage in this study from an organisational level.

Based on prior literatures, Rice et al. (2017) investigated how various affordances have positive and negative effects on the relationship between people and organisational ICT in the digital age. They identified six affordances from 79 items and 13 categories of affordances; the six affordances were: pervasiveness, editability, self-presentation (or identity management), searchability, visibility, and awareness. They found that specific affordances incorporated in different organisational levels of framework exhibited different relational patterns in organisational communication research, as various affordances are conceptualised as action possibilities. For instance, organisational ESM is noted to be significantly correlated with pervasiveness, editability, and awareness, whereas group-level media affordances are more associated with editability and pervasiveness. Most technological performances were confirmed to correlate to with several affordance

attributes, which vary in different contexts and with different users (Leonardi and Barley, 2008).

In the context of China, Song et al.'s (2019) study indicated that the joint usage of *DingTalk* (work-oriented SM) and *WeChat* (socialization-oriented SM) exerted positive influences on team and individual performance, and the two types of SM complementarily contributed to the performance of Chinese financial service companies. Additionally, Song et al. (2019) argued that, *DingTalk* is a formal work-oriented platform on which employees can perform work-related activities to facilitate better availability of affordance in instrumental ties and achieve their collective goals. Likewise, Shao et al. (2020) and Pitafi et al. (2023) empirically identified such three technology affordances of SM (interactivity, information, and navigation) that could have a positive impact on different users in a Chinese college and satisfy different users.

Therefore, the technology affordances of ESM are not exclusively about the properties of materials, because they are constituted in the relationships between the material's features, an individual's perception, and an organisation's environment (Anderson and Robey, 2017; Chan et al., 2019).

### **2.3.3 Benefits of ESM**

As mentioned in previous section, Leonardi et al. (2013) used three metaphors to describe ESM: a leaky pipe for organisational communication, an echo chamber where practitioners engage with like-minded peers sharing professional practices, and a social lubricant with an informal network smoothing the social fabric of an organisation. These metaphors can be the starting point of an investigation of ESM, which may yield novel perspectives from the fields of social capital, boundary work, attention allocation, and social analytics. Later, Leonardi and Meyer (2015) argued that knowledge transfer is made easier with the communication SNS tool because it lubricates stuck knowledge, and because individuals may reduce the ambiguity of

knowledge transfer and their ultimate satisfaction with knowledge transfer is increased.

Huang et al. (2015) identified a dynamic structural framework of a specific SM platform as enterprise blogging internally, and shed light on the capability of ESM to prompt effective collaboration and better performance in organisation. It has been confirmed that an ESM environment can positively influence knowledge sharing through *tertius iungens* activities (or “third who joins”), and improve the knowledge self-efficacy of co-workers (Yan et al., 2016). As a result, ESM plays an important role in individual performance, especially from the perspective of social cognitive theory (Bandura, 2001) and social capital theory (Kwahk and Park, 2016). To some extent, the result of Kwahk and Park’s (2016) study is consistent with the previous study of Karoui et al. (2015), which demonstrated that SM may increase individuals’ own symbolic capital and reduce the gains in others’ symbolic capital by SNS adoption in the area of Bourdieu’s social space theory.

Mäntymäki and Riemer (2016) identified and investigated five uses of ESN, which are: ideas and work discussion with colleagues, problem solving, task management, informal talk, events and updates. However, Mäntymäki and Riemer (2016) focused narrowly on utilitarian aspects of the value of ESM rather than social value, such as well-being in the workplace. The implementation of the SM, Web 2.0, and Enterprise 2.0 benefit individuals by increasing their sense of cultural belonging and commitment (Leidner et al., 2010; Collin et al., 2011) across both hierarchical and geographical boundaries (Gibbs et al., 2015). Similar to characteristics of SM, ESM extends the personal and professional boundaries of employees in the workplace (Alahmad et al., 2018).

Moreover, an ESM tool helps transform a networked enterprise into a resilient “social organisation” with mass collaboration as an integral culture (Bradley and McDonald, 2011). Similarly, from a firm’s perspective, ESM, as a complementary IT capability can help employees increase their engagement, and develop an informal network, which can benefit an organisation (Braojos et al., 2019). In general, a lot of similar evidences show that ESM changes rigid hierarchies, corporate silos, and walled-off



departments into transparent, open-ended, and horizontal relationships (Bennett et al., 2010; Alahmad et al., 2018). Furthermore, it can reshape the influence of leadership power in organisations, then as a whole, long-term benefit to the global business (Archer-Brown et al., 2018). According to Song et al. (2019), work-oriented usage pattern and technology affordances of *DingTalk* are confirmed to engage workers and facilitate workers' performance significantly in terms of instrumental values and professional interactions.

Despite challenges and differences between Western and Eastern cultural societies, this study is consistent with the positive attitudes and opinions about the advanced technology in the business book "*Throwing Sheep in the Boardroom*" (Fraser and Dutta, 2008). Web 2.0 tools like ESM transformed social interaction, organisational behaviour, and corporate management; practitioners need to recognise the potential of collective intelligence and collaboration through technology implementation. And here, 20 years later, Web 4.0 innovation and Internet infrastructure optimisation have accelerated informatisation of governmental and state-owned enterprises in China. Now, these institutions are demanding more changes under innovative ESM environment.

#### **2.3.4 Risks of ESM**

Technological advances enable people to work and perform better, but they also increase the demands on and risks for workforces and organisations (Patel and Jasani, 2010; Ventola, 2014). Although there have been developments in interconnection technology during the first decade of this century, many people still consider social networking tools a waste of time and a potential liability when used in the workplace inappropriately (North, 2010). How to use ESM appropriately in enterprises, how to not reveal much secret business information online, ethical issues, and legal issues about electronic backups via a SM tool, are relatively new problems for contemporary organisations (Looy, 2016). From the perspective of dystopian determinists, technological development imposes structural constraints

and controls on people, which would even deprive employees of independent thoughts and track their performance under surveillance via digital trajectory online and SM database (Dima-Laza, 2012). However, an ambivalent view of SM straddles the middle ground of technological utopia and dystopia, which provides an appreciation of the complexity of human–technology interaction and an acknowledgement of multiple, contradictory effects (Rambe and Nel, 2014).

Based on pedagogical complexities presented in research, Rambe and Nel (2014) expressed some concerns about technology adoption and the challenging circumstances of using SM in resource-poor environments. Another argument about SM as a tool is that there are no explicit ties between activity on a social network and a direct return on productivity (Rooksby et al., 2009). With the increasing deployment of SM tools in enterprises and industry, many recent studies on ESM usage indicated various types of challenges in relation to employees' behaviours within the workplace and negative impacts on JS (Ayyagari et al., 2011; Zheng, 2014; Zhang et al., 2015; Yu et al., 2018; Matthes et al., 2020; Bhave et al., 2020).

From the aspect of individual well-being, Yu et al. (2018) explored the phenomenon of excessive use of ESM with an extended stressor–strain–outcome research model, and identified three components of ESM-related overload: information, communication, and social overload. In line with the research of Yu et al. (2018), Matthes et al. (2020) argued that, online telecommuting and loss of social interaction may arouse a low sense of involvement and belonging, while being overloaded with information through mobile SNS use can bring depressive symptoms, stress, and dissatisfaction to human well-beings. Thus, excessive use of ESM can cause negative cognition and emotions of employees, and psychological strain, which can lead to fatigue or exhaustion, even lower creativity and JP (Wang et al., 2023; Si et al., 2023).

Furthermore, based on work–family boundary theory, excessive ESM use might blur the boundaries between professional life and personal life (Boswell and Olson-Buchanan, 2007; Koch et al., 2012; Choroszewicz and Kay, 2020). For instance, those employees who have a strong awareness of boundary would reject “always

being online” and log off mobile ESM to escape job-related messages after hours. However, an excessive work requirement after hours that permeates the non-work domain of an employee might interfere with the employee's family life, leading to work life conflict, turnover, or absenteeism (Delanoije et al., 2019).

From the perspective of an organisation, when there are highly interdependent tasks, more interactive social relationships are needed for cooperation and support; however, Pitafi et al. (2020) found that problematic usage of ESM has a negative effect on task conflict. In addition, based on the finding of Yu et al. (2018), Sun et al. (2019) implied that media affordances might cause groupthink and lead to the hindering of knowledge sharing and a lack of innovation, which is consistent with Leonardi et al.'s (2013) argument. For example, employees tend to give obedience to the majority on knowledge conversations through ESM, which confines the flow of knowledge. Certainly, these dark sides linked to ESM usage could lead to reduced productivity for organisations and low creativity in work performance (Leonardi et al., 2013; Moqbel and Kock, 2018; Ding et al., 2019; Liu and Bakici, 2019).

Last, but not least, besides time loss, psychological risk, interactions among multiple parties on ESM platforms, there are two other big concerns about ESM adoption: ethical issues of data privacy and information leakage (Patel and Jasani, 2010; Ventola, 2014; Sun et al., 2019; Bhave, et al., 2020). Data privacy includes individual privacy and organisational confidentiality. Gibbs et al. (2013) found that the “return receipt” feature and pervasiveness of affordances of ESM are often considered an invasion of privacy by workers, because they would like some ambiguity and limited information in relationships between colleagues. For individuals, the perception of their privacy being invaded might be caused by electronic performance monitoring through *DingTalk* in too many contexts, including: off-hours via real-time location technologies; internet surveillance of email, video, and telecommunication via collaborative technologies; and even biometrical detection (Bhave et al., 2020). Additionally, for organisations, if there were a lack of legal documentation on data ownership and a lack of management department for data coordination, then data breaches can be very risky in confidential information storage and transmission.

A CNNIC (2023) reported found that the number of instant messaging users in China reached 1.047 billion, accounting for 97.1 percent of the total netizens as of June 2023. Furthermore, the problematic usage of *DingTalk* has been criticised as it leads to time wasting, technology addiction (Zheng, 2014), or data insecurity (Picazo-Vela et al., 2012; Wu, 2018). Accordingly, some IT professionals considered that the weakness associated with the use of an ICT tool in the workplace may outweigh the benefits (Trusson et al., 2018).

On account of the positive and negative impacts, researchers find the usage of ESM controversial and complex in different cultural contexts and in a variety of working conditions. For instance, Khan et al. (2014a, b) mentioned different risks (i.e., social risk, time risks, psychological risks, and privacy concerns) and suggested strategic guidelines for implementing SM applications in the public sector for governments in a collectivist culture (e.g., South Korea) and individualistic cultures (e.g., the USA). Similarly, Oktosatrio (2019) revealed relationships between work–life balance, motivation, and JS in certain contexts of the public sector. *DingTalk* implementation and its impacts on JS and behaviour outcomes of employees in China must differ from those in Western cultures; thus, particular communicative practices for the best use of *DingTalk* must be embedded in organisations.

In summary, because of differentiation in the level of operating ESM tools, various emotions and attitudes could vary significantly from one organisation to another. As Xie et al. (2018) argued that, there is a lack of recognition of how and why employees suffer from emotional exhaustion in relation to work-related use of ICT after hours (W\_ICT) within organisations of different cultures. Since relationships between W\_ICT and the well-being of workers are heterogenous, research object depends on the way how employees identify and evaluate the changes and effects brought by ESM usage. Consequently, this thesis aims to better understand the complex phenomenon of a specific ESM, *DingTalk*, through the detailed assessment of benefits, risks, and strategic usage of the tool in Chinese state-owned enterprises and institutions. Although research on W\_ICT focuses more on negative impacts, the

impacts still need to be categorised and explored regarding specific personal and environmental factors, as in the current study (Wang et al., 2019).

## **2.4 Examining JS and Related Concepts**

### **2.4.1 The Concept of JS**

The JS of employees has been widely studied in thousands of publications and it is recognised as a significant concept in the field of OB. It has become a classic topic with a long history since it was originally put forward by Hoppock (1935). Hoppock argued that the context of JS consists of psychological, physical, and mental satisfaction, and the degree of JS is linked to the individual needs and job characteristics. Herzberg et al.'s (1959) "dual-factor theory" of motivation proposed that JS varies in relation to the structural characteristics of the workplace; moreover, factors of satisfiers and dissatisfiers have been widely tested in management practices. In addition to job characteristics, individual differences in terms of personality and motives also affect JS (Vroom, 1964; House and Wigdor, 1967). Smith et al. (1969) proposed that JS can be a function of a job with its characteristics, in other words, a particular aspect of a job could be satisfying for one individual but dissatisfying for other workers.

Kalleberg (1977) referred to JS as an overall affective orientation of people towards the work roles they are occupying. Individuals need to balance their satisfaction with the multiple dimensions of a job and achieve a composite consideration, which can be measured by multiple questions and indicators. Later, extensive researches emerged to develop models and evaluate JS for employees in a variety of occupations in different industrial settings (Zaharia and Baumeister, 1979; Hünefeld et al., 2020). After the late 1970s, among various studies on human services and workers, the well-known "motivation and personality" theory of Maslow (1987) emerged as a transition to humanistic psychology, which was aware of satisfaction and of alternative needs and goal-seeking behaviours. An influential definition of JS as "pleasurable or positive emotional state resulting from the appraisal of one's job as achieving or facilitating one's job values", "or job experiences", was presented by

Locke in 1969 (p. 317), and 1976 (p. 1300). And Spector (1997) noted that JS can be simply defined as how people feel about the job and different aspects of their job. Nonetheless, some current attitude researchers prefer the definition that JS is “an attitude toward one’s job” (Miner, 1992, p. 116); thus, exploring attitudes in and around organisations can reveal attitude-behaviour relationships (Brief, 1998). As attitudes are composed of affective responses, beliefs about the object and behaviour components (Weiss, 2002), JS can be commonly viewed as a summary of evaluative judgments made about a job, affective experiences at work, and beliefs about a job.

#### **2.4.2 Presumed Factors of JS and Relation to ESM**

Many studies proposed the significant factors that determine JS. From the perspective of Herzberg’s Two Factor Theory (1959), the JS of employees can be identified as motivation (intrinsic factors) and hygiene (extrinsic factors). Motivators of individuals are widely cited as how people feel about the essential characteristics of job duties, such as achievement, recognition, responsibility, advancement, growth and work itself. However, hygiene or extrinsic factors include elements such as supervision, company policy, interpersonal relations, work conditions, salary, and job security, which address the external context of employment status. Both intrinsic and extrinsic factors should not be excluded from the influencing factors of JS, even if they correspond to inner satisfaction and exogenous satisfaction, respectively (Felekl et al., 2021). Based on three subscales of JS: intrinsic, extrinsic, and general satisfaction with a job, Arvey et al. (1989) indicated that the impacts of personal and situational factors on JS could be discussed using a behavioural genetics approach and perspective of person-environment interactionist. Weiss and Cropanzano (1996) proposed three approaches to evaluate JS, which have three theoretical orientations, called cognitive judgment, social influence, and dispositional characteristics. Cognitive judgment is generally based on a set of job and workplace characteristics; social influence emphasises the input of social information to the employee’s

perceptions and standards; besides job attitude, dispositional (personal) characteristics affect employees' JS, such as positive affectivity and negative affectivity. Consistent with the theory of affective experience on JS, Brown and Peterson (1993) categorised the antecedents of JS into five aspects, namely, work outcomes, personal characteristics, role perceptions, organisational variables, and job variables. Among the five categories, role perceptions are considered as the most significant impact on JS, following with organisational variables and personal characteristics. Similar to these significant determinants, Spector (1997) indicated that three important features of JS are related to human values, organisational functioning, and activities. Aziri (2011) provided a comprehensive summary of various definitions of JS, determinants of it, and different models related to it from extant literatures. Gupta and Garg (2017) found that employees of the hospitality industry were dissatisfied with the management of supervisor, salary, promotional opportunities, work environment, and internal policies. Correspondingly, significant factors for the satisfaction of workers are monetary benefits, and the behaviour of their co-workers, supervisors, and customers.

Steijn and Voet (2017) proposed that prosocial motivation and red tape are important characteristics of work in public sector, which affect the JS of public employees through different mediated mechanisms, in some extent the influences are conflicting. For instance, red tape could be a hindrance stressor and decrease JS, thereby a strategic remedy is needed for public practitioners regarding red tape, such as an ESM tools assistant. Based on the self-determination theory (SDT) framework, three mediators of SM are competence, relatedness, and autonomy. ESM usage is indicated to be positively associated with competence and autonomy, but not with relatedness; ESM has been proven to have an indirect effect on the JS of Australian government employees (Demircioglu, 2018). Uniquely, the JS of public employees in Myanmar is significantly influenced by interpersonal relationships, personal well-being, work itself, and recognition (Thant and Chang, 2021), which provide a reference value for my research. Similarly, Chu (2020) provided a comprehensive

statistical summary of current literatures that demonstrated positive associations between ESM and JS of employees, especially the moderating effect of job position. On the other hand, with the development of prevalent Web 4.0 applications, hundreds of thousands of online reviews and comments form a large database that contribute to the statistical significance of mediator roles of JS. For instance, Lu et al. (2019) identified a comprehensive knowledge of JS and influencing factors among many reviews of nurses in hospitals, which similarly included work environment, work climate, supervision, core self-evaluation, and organisational commitment. Likewise, through electronic word of mouth of employees' online reviews, Stamolampros et al. (2019) found that increasing career opportunities can reduce the likelihood of employee's turnover and positively improve their overall satisfaction. In addition, text analysis of *Glassdoor* (a US website where current and former employees review companies) online reviews revealed that management leadership and corporate cultural values were determinants of high employee satisfaction (ibid). This finding is in alignment with the result of previous analysis by Lee and Kang (2017), which identified that "culture and values" and "senior management" have the highest influence on JS according to website data mining. Conversely, Goldberg and Zaman (2018) found the most urgent issues of employees' dissatisfaction by selecting 200,000 employees' dissatisfied reviews and generating "smoke" words from *Indeed.com* (an employment website). Moreover, 30 fine-grained JS factors were derived from textual reviews through Latent Dirichlet Allocation (a statistical model), and the most important nine factors of JS from the analytical results were taken into consideration in the study of Jung and Suh (2019). They analysed the sentiment and importance of the factors at four levels: industry level, company level, group level, and chronological level; they then identified five new JS factors (i.e., project, software development, inter-firm relationship, marketing, and overseas business) with text mining techniques.

Therefore, several research studies point out that JS is a complex and multifaceted concept, as well as the result of a blend of subjective and objective causes. JS often varies with one or more antecedents, or in different contextual settings, such as



conditions of work itself, organisational constraints, social factors, cultural values, economic factors, and technological factors (Mullins and Christy, 2016). Therefore, this study identifies objective conditions and the psychological state of individuals, which are the main determinants of JS related to ESM in existing literature, and outlines them in the following sections.

#### **2.4.2.1 Job Characteristics**

The content of the job, characteristics of the job, and employee status within the job are considered the primary determinants of JS (Brief and Aldag, 1975; Hackman and Oldham, 1980; Chu, 2020). For example, Hackman and Lawler (1971) identified four core dimensions of a job: autonomy, variety, task identity, and feedback; Hackman and Oldham (1980) identified five core job dimensions: skill variety, task identity, task significance, autonomy, and feedback, which constitute the job characteristics theory (JCT); Kalleberg (1977) identified six dimensions of work. Building on a work design perspective, Wang et al. (2020) explored three aspects of how ICT use influences individual's well-being and effectiveness, such as reducing job demands, increasing work scheduling autonomy, and changing relational aspects of work. All were considered the theoretical lens to understand the various impacts of significant job attributes on employees' JS and work outcomes.

The special nature of public employment and inherent financial restrictions imply the preference for hiring people who have relatively low economic-oriented expectations and high service-oriented belief (Crewson, 1997). In addition, they are expected to be more satisfied with intrinsic factors than extrinsic rewards, which contrasts with their counterparts in the private sector (Rainey, 1982; Zhang et al., 2011). JCT posits that jobholders are generally motivated internally by meaningful working experiences and feel responsible for performance of high quality. Furthermore, JCT proposes that an individual's knowledge, skill, and contextual satisfaction are integrated with their personal growth needs, such as future work opportunities and accomplishments (Oldham and Hackman, 2005). Moreover, as every agency in the public sector is unique, with its own type of administrative function and value that are the result of

contextual factors and culture, the motives of public employees in many Western state institutions differ (Perry and Hondeghem, 2008).

Specific job positions, corporate culture, public service value, and leadership in the public sector in China must be very different from that in public service systems in Europe and the USA. A variety of public institutions and state-owned enterprises in the public sector in China were chosen for this study: Tax bureau, China Media Group, state banks, public hospitals, China FAW Group, and China Telecom. The skill utilisation, task content, administrative functions, professional features, and organisational characteristics of different public agencies will vary. For instance, the information department of public hospitals addresses public welfare and benevolent value, the China FAW Group puts a high valuation on technological innovation and overcoming challenges, and tax authorities emphasise strict principles, precise attitude, harmonious cooperation, and transparent feedback. In spite of these differences, all Chinese state institutions are developing explosively and anticipated to improve governance effectiveness and service efficiency through ESM assistance using digital technology. In the past, public professionals were affected by elaborate bureaucratic procedures and work pressure, now they all need to adapt to the same dominant tool, cooperate with the new workflow, and handle similar job challenges in contemporary industry (Hong et al., 2023).

Hence, this study investigates employees' general working experiences towards *DingTalk* phenomenon in the public sector in China, rather than emphasizes the effects of distinct job characteristics on their JS within different contexts.

#### **2.4.2.2 Organisational Support**

The concept of perceived organisational support (POS) was introduced by Eisenberger et al. (1986), it represents the possible feelings of employees about their work organisation and their affective bond with it. From the perspective of social exchange (Cropanzano and Mitchell, 2005), the finding indicates the heuristic value of organisational commitment, and five aspects of models that individuals make efforts in working settings for material goods and symbolic values. These models

presented the significant exchanging relationships are: leader-member exchange, support to commitment, team support, supervisory support, and trust. Many organisational theories have explored the reciprocal resources of POS including physical working conditions, various kinds of treatment, the organisational procedures, supervisor support, organisational rewards, and organisational discretionary control over job conditions; the different between POS and overall JS can be distinguished by the beliefs of employees on organisations (Eisenberger et al., 1997; Rhoades and Eisenberger, 2002). Some authors argued that organisational commitment and JS may be reciprocally related during the developmental phase of workers' tenure in the organisation when a research design satisfies conditions of longitudinal time and a cohort of employees (Farkas and Tetrick, 1989). Furthermore, Shore and Tetrick (1991) systematically evaluated the dimensionality of POS and concluded there were many distinctions between POS and JS. For instance, POS, as a set of cognitive beliefs, lead to organisational commitment, whereas JS is considered an affective reaction to various facets of work; POS may directly affect JS in different elements of work situations (Rayton, 2006). Likewise, Brown and Peterson (1993) suggested that two organisational support variables, which are supervisory behaviours (e.g., encouragement, recognition of achievement, and frequent communication) and task variables, both have important effects on JS. Therefore, organisational support theory is often considered most important foundation to evaluate relationships between JS (Rouibah et al., 2009) and the intrinsic nature of work itself. For this research, multiple indicators should be selected and considered to construct the model; thus, this research synthesises all the influencing factors in organisations and takes organisational support as a global measurement of JS from the view of sociomateriality.

As a part of workplace facility, ESM adoption is not only an interactive internal platform for employees to communicate, collaborate, and share worked information with co-workers, but also it offers the internal functions of supervision, training, variety, independence, and retention, and external social support (Bradley and McDonald, 2011; Fu et al., 2019). Especially, the way of a senior manager

communicate with their employees in such an inclusive and approachable manner, will be reflected on SM (Yan et al., 2016; Lee and Kang, 2017; Stamolampros et al., 2019; Wang et al., 2023).

Increases in wage levels and rewards obviously have a positive impact on JS as elements of job characteristics (Tziner, 1983); nevertheless, according to Clark (1996), little empirical evidence was found that wage profiles could be influenced by ESM adoption and wage profiles were very weakly related to JS in the public sector (Hackman and Lawler, 1971; Grund and Sliwka, 2007). Based on extant literature in this area, public employees rely more on intrinsic motivators as interpersonal relations, working conditions, recognition, and responsibility than other extrinsic factors of JS (Thant and Chang, 2021). In the setting of current study (Chinese state-owned institution and public sector), financial rewards and income are relatively stable for different levels of employees, and they cannot be influenced by an ESM environment. Therefore, although some researchers argued that payment is associated with JS, this factor is excluded from the JS analysis of public workers who are using the *DingTalk* tool.

To sum up, since SM has profoundly changed the way people work, and has helped individuals to easily expand their network, highlighting the importance of technology implementation in organisational support is relevant (Oh et al., 2014). Implementation of *DingTalk* or another ESM may act as an important technological artifact in organisational support; it might be a key driver of job outcomes and could change organisational relationships (Morris and Venkatesh, 2010; Mo and Yu, 2017; Song et al., 2019). All the work-related antecedents and job characteristics within the specific organisations make up the critical presumed factors of JS.

#### **2.4.2.3 Corporate Culture Traits**

Whether an employee can fit an organisation's mission of corporate social responsibility and its prescribed way of technology acceptance are related to different enterprise climate and regional cultural traits (Zhang and Zheng, 2009). For instance, Downie (2006) demonstrated that people's heritage culture has an impact on their

daily social interactions. Skattebo (2009) revealed the relationship between different stages of technology lifespan and organisational climate (or system support climate) help improve investment into technology acceptance. Bennett et al. (2010) indicated that the key to increasing levels of employee satisfaction and workplace productivity was to revitalise and reshape the organisational culture with ESM tools. Furthermore, Gibbs et al. (2015) argued that ESM with its unique affordances could shape new ways of communication in an organisation, but its diverse usage patterns must be studied in particular practices and culture norms. Even though ESM cannot make changes to an ongoing organisational culture, its usage is still consistent with broader human resource practices that bring about more participatory management (Gibbs et al., 2015).

A corporate culture that meets employees' needs engages employees to help them adapt easily to all its aspects and it has been proven to have a significant influence on overall JS (Lee and Kang, 2017; Stamolampros et al., 2019). Based on Hofstede's (2001) differences of societal cultures, Khan et al. (2014b) indicated that SM strategies differed according to various cultural values (i.e., collectivist or individualist), which would apply to different countries and public institutions. Chinese culture has a strong collectivist strand; the impacts of ESM adoption on the JS of workers in China would certainly differ from the impacts on workers in a Western culture.

As the research context is China, not only social relationships unique to China should be taken into the consideration in this study, but also the specific core values at the industrial and organisational level. Especially, large power distance, weak uncertainty avoidance, and collectivism in the Chinese value system, reside in organisational culture and practices, which will lead people to cope with technological transformation differently (Hofstede, 2011). For instance, the requirement of being continually connected to *DingTalk* may decrease overall JS for those who do not wish to volunteer their time, but are required to do so under the mandatory culture of certain organisations. In the public sector, employees are more likely to follow authority and obey the demands of their leader, because of high power distance.

Public institutions might improve collective trust, and honesty, empower employees, and increase their sense of belonging (Pope, 2004) through a community on the platform, but only when top management is engaged in the transformative process and provides support for technology adoption. Employees are more inclined to perform telecommuting online on a voluntary basis in a cooperate culture of low power distance.

Ding (2019a) combined traditional Chinese culture and personal psychological motivation to investigate the influence of ESM usage on knowledge sharing and creativity stimulation. Ding (2019a) claimed that the group climate of cooperation and competition could better leverage the moderating effect of different patterns of ESM usage on the innovate outcomes of firms. The recruitment criteria for public employees in China place a higher value on cooperation than on competition and on organisational interest rather than self-interest, which helps to select employees with service-oriented values and prompts the institution to operate for the common good (Vandenabeele, 2007). Thus, it is important to understand the impact of cultural characteristics of public sector institutions on the JS of *DingTalk* users (Huo et al., 2020; Hong et al., 2023).

#### **2.4.2.4 Individual Characteristics**

The personal characteristics or traits of employees influence their JS in the workplace every day through affective stimuli (Judge and Larsen, 2001), such as education, age, demographic, past experiences, self-efficacy, job autonomy (Huo et al., 2020) and capability to use technological tools in contemporary industry. For instance, the study of Saunders et al. (2017) found that due to individual cognitive capacity, older users generally feel more information overload than younger users when multi-tasking. Likewise, Lu and Gursoy (2016) argued that significant generational differences related to a workforce can be found between Baby Boomers, Generation X, and Millennials, such as how employees perceive and value their jobs. Moderated by differences, such as learning capability and cognitive

preferences, Millennials were reported to have significantly lower JS levels and a higher turnover inclination than Baby Boomers (*ibid.*).

Utilising ESM with positive affectivity might dispose people to modulate emotional reactions, which would result in more favourable working relationships with co-workers and supervisors (Judge and Larsen, 2001). Conversely, aggressive or pessimistic emotions may emerge from problematic tool usage, which could inhibit the development of harmonious relationships and reduce the JS of employees with negative affectivity (Rice, 1993). Many studies showed that employees' positive beliefs in their inner values, multiple intrinsic motivations, competency, self-efficacy, organisational-based self-esteem, and optimism (Maslow, 1987; Herzberg, 2003; Xanthopoulou et al., 2007, 2009b; Mo and Yu, 2017), which are associated with daily ESM usage, affect their JS.

Locke (1976) proposed that JS is an emotional state comprising job affect and cognitive appraisals of the work situation (i.e., that it has both affective and cognitive components). Along with the historical development of work itself, transient affective responses to a work situation, as well as the enduring characters of an individual's personality, are associated with variability in JS and they interact with dynamic changes in the workplace. For instance, a manager's bureaucratic personality is said more likely to determine their preference for rules and regulations in private firms than in public agencies, in the context of the US National Administrative study project (Bozeman and Rainey, 1998). The impact of personality traits on an employee's mood and affective reactions to situation stimuli from ESM usage in the workplace vary, such as neuroticism and extraversion (Ilies and Judge, 2002). Furthermore, the five personality traits of the Revised NEO Personality Inventory, which are neuroticism, extraversion, openness, agreeableness, and conscientiousness, have been proved to be increasingly important as predictors of JS in the field of psychology (Costa and McCrae, 2008). Xanthopoulou et al. (2007, 2009a) argued that personal resources contribute significantly to employees' work-related perceptions and the variance in their exhaustion and work engagement.

Kwon and Wen (2010) introduced the new psychological concept of perceived encouragement into Davis's technology acceptance model to evaluate SNS usage. They emphasised that individuals with high social identity, altruism, and telepresence are highly likely to receive encouragement. Moreover, they suggested that a future research model needs to consider individual differences affecting intentions to use SNS more accurately. In the research of Peng et al. (2016), core self-evaluation is said to predict job burnout and have a mediator role on JS, as an integrated personality characteristic in Western culture. Archer-Brown et al. (2018) indicated that crucial individual characteristics or traits, such as age and experience of worker, could moderate boundary management behaviours of ESM usage, which should be considered in improving work relationships and well-being.

However, the current research context is in China, besides age, education, gender, and tenure, the "big seven factor" structure of Chinese personality are often used as the unique variables to explore the relationship between JP and personality traits (Wang and Cui, 2003, 2004a). In contrast to the five-factor model of the Western personality, the original Chinese personality scale (the Qingnian Zhongguo Personality Scale, QZPS), consists of 215 items with 7 dimensions. They are: extroversion, kindness, behaviour style, talents, emotionality, human relations, and ways of life (Wang and Cui, 2004b; Wang et al., 2005). Wang and Cui (2008) empirically investigated task performance, personal quality performance, and performance evaluation by others of Chinese local government executives. They indicated that the five traits (neuroticism, extraversion, openness, agreeableness, and conscientiousness) of the Revised NEO Personality Inventory could not explain the governmental workers' performance effectively, and might lead to incorrect findings. Consequently, the Chinese personality dimensions of QZPS are proven to have higher predictive validity for JP.

Furthermore, the employees of public agencies are generally described by sociologists as having the following characteristics. They are hired for their specialised skills after advanced education or training; their competencies are tested by high-standard examinations; their values and beliefs are consistent with the



occupational characteristics; altruistic work services are promoted to pursue the common good and maximum social welfare (Rainey and Steinbauer, 1999). Along with this shared identity, employees in the public sector have a relatively fixed salary and working conditions, and are more likely to behave in a conformist manner. However, what specific personality attributes may be displayed in a workplace that uses ESM and how the behaviours of public employees are influenced is under-examined.

Therefore, a comprehensive description of personality traits not only includes individuals' characteristics, emotions, experiences, and attitudes in correlation to JS (Nikolaev et al., 2020), but also includes the significance of the job to an entire life experience, regarding a person's group context and disparate psychological conditions. The implementation of work-life balanced initiatives have been proven to improve the performance of public employees through JS (Oktosatrio, 2019). Thus, studying individual characteristics of public employees is of significance in linking ESM usage to agility performance of employees (Cai et al., 2018, Pitafi et al., 2023).

### **2.4.3 Behavioral Outcomes of JS and ESM**

Davis and Newstrom (1981) argued that JS is closely linked to employees' behavioural outcomes in the workplace and technological advancement will bring improvements, as well as pressure on individuals. Technology and humanity are both key elements in a complex sociotechnical organisation; hence, the behaviour of employees is of significance in the delicate balance between technical and social systems (Newstrom, 2014; Yukun and Zhonggen, 2023).

Bandura (1997) asserted that individual behaviours are the result of interactions between the social environment and individual cognition; thus, experiences of mastery and the enhancement of self-efficacy play a crucial role in producing corresponding behaviours and persistence of performance. Additionally, according to social cognitive theory (Stajkovic and Luthans, 2003), when learning and executing a specific task in a given context, people are influenced by five core capabilities, which

are symbolizing, forethought, vicarious learning, self-regulation, and self-reflection. For a technological tool use, the constructs of self-efficacy and collective efficacy of employees have been demonstrated to be effective predictors of JP in organisations, at both the individual and group levels (Stajkovic and Luthans, 2003; Yukun and Zhonggen, 2023). Consequently, when enterprises confront transformations in the digital era, different levels of JS influenced by ESM usage will lead to alternative OBs, which can be categorised as good outcomes and harmful ones (Landers and Callan, 2014; Robbins and Judge, 2017). According to Herzberg's dual-factor theory of job motivation (Herzberg, 1959, 2003), higher JS will mainly contribute to constructive results, such as higher JP, better organisational citizenship behaviour (OCB), greater life satisfaction, and well-being (Moqbel, 2012; Zhang and Zheng, 2009; Feleki et al., 2021). Reversely, lower JS will usually lead to destructive impacts on individual behaviours and the deny of their job, such as inappropriate use of ESM in work. Some individuals might not adapt to the current technical environment or adopt a technological tool in negative ways, leading to counterproductive work behaviour (CWB), such as exit, disloyalty, and neglect. Or, under very specific conditions, a minority may voice an active and constructive response to the ESM tool, which results in creative performance (Zhou and George, 2001). These various OBs are categorised as following.

### **1) High JP**

JP has always been a central topic of OBs, and generally comprises two fundamental aspects: routine JP and innovative JP (Katz, 1964). Using these concepts, Ali-Hassan et al. (2015) developed a research model based on three dimensions of SM use, which are social, hedonic, and cognitive use of the technology.

Different dimensions of SM contribute to different adoptions of SM in the workplace, which enhance various JP in organisational contexts. For instance, from the perspective of social capital, cognitive use of ESM is found to support both routine and innovative JP, whereas hedonic use of technology is shown to affect routine JP negatively, and is positively linked to innovative JP. Likewise, *DingTalk* reminds individuals to comply with regulations, fulfil all assigned tasks required by the job, and

perform maximal responsibilities in routine activities. Moreover, as an emerging and popular technology, it is expected to prompt innovative activities and to tackle unusual problems and situations through work-related use (Guo, 2023). Therefore, the effect of ESM technology use in different organisational settings contributes to varying performance and JS in an organisation (Ali-Hassan et al., 2015; Yukun and Zhonggen, 2023). It is reckoned that high JP is one of the most significant outcomes of many consequences linked to JS through ESM implementation (Charoensukmongkol, 2015; Chu, 2020; Bai and Yan, 2023; Shang et al., 2023).

## **2) Good OCB**

OCBs often include supporting co-workers, engagement in citizen behaviours (Robbins and Judge, 2017), knowledge sharing with colleagues, and collaboration across boundaries via discussions, blogs, and reports by ESM tools. Janssen and Van Yperen (2004) provided empirical evidence that the quality of leader member exchange and interpersonal mechanisms mediated the positive effects of employees with a stronger mastery orientation in terms of their in-role JP, innovative JP, and JS. Therefore, training employees' professional ethics and mastery orientation in performance associated with technology use are key determinants of JP. According to Cao et al. (2012), higher use of ESM in knowledge exchange and resource locating would help stimulate trust among co-workers, influence implicit knowledge transfer, knowledge sharing (Ahmed et al., 2019), and strengthen strong ties with external networks. Additionally, based on collaboration, the productivity of employees would be improved (Leftheriotis and Giannakos, 2014).

## **3) Great Life Satisfaction (or Well-Being)**

Moqbel et al. (2013) shed light on SNS use intensity promoting work-life balance and positively impacting JS through empirical data of working professionals. Since attitudes, experiences, and balancing work-life realms of technology use in work constitute a large part of JS, they cannot be separated from the overall happiness of employees' lives. For instance, Matthes et al. (2020) and Wang et al. (2023) argued that information overload from being permanently connected to an SNS is a significant predictor of depressive symptoms, which negatively influence individuals'

work–life balance over time. If employees have to check work emails or deal with job issues using *DingTalk* after official working hours, then they could suffer from emotional strain and role conflict, which can have negative impacts on JS and JP. On the other hand, good use of ESM could offer an opportunity to promote work–life balance, maintain the well-being of employees, and enhance positive attitudes towards the organisation. As Archer-Brown et al. (2018) argued, ESM offers more opportunities for employees to more openly and more flexibly span working boundaries independent of any formal or monitored workplace.

#### **4) Exit, Disloyalty, Neglect, CWB**

Farrell (1983) highlighted workers' negative responses to job dissatisfaction, which are summarised in four theoretical categories: exit, disloyalty, voice, and neglect. Among the four ones, voice can be considered as promotive extra-role behaviour to make improvement (Van Dyne and LePine, 1998), while the other three responses may be passive towards the organisation and negative towards the current job (Zhou and George, 2001). The problematic use of ESM is said to hinder knowledge sharing by affording an overload of information, communication, and social networking, which are requested by work. An excessive usage of ESM can lead to exhaustion and reduced productivity in knowledge sharing and work schedules (Sun et al., 2019). Role overload, conflict and ambiguity arising from job demands made during employees' private time are argued to have a significant, negative effect on both JP and JS (Christen et al., 2006; Chu, 2020; Si et al., 2023; Liu et al., 2023). Therefore, harmful ESM-related work behaviours need to be examined and identified through specific predictors of those behaviours, then altered to benefit the workplace (Landers and Callan, 2014).

#### **2.4.4 The Concept of JP**

One key construct of OBs is JP. In an abundance of literature, higher JS results in positive JP outcomes and vice versa (Spector, 1997; Aziri, 2011). ESM usage could influence employees' performance in different ways under different organisational

conditions (Kuegler et al., 2015; Chu, 2020).

However, there is considerable debate in the literature about the causal sequence of the link between JS and JP: whether satisfaction leads to performance or performance leads to satisfaction. For example, Lal et al. (1994) argued that JP often influences JS through indirect ways of compensation or promotion. Furthermore, Christen et al. (2006) proposed a model in which JP, three role perceptions (i.e., role ambiguity, role conflict, and role overload), and four job factors (i.e., job autonomy, job attractiveness, quality of supervisory feedback, and social climate) are the key variables affecting JS. Besides, Christen et al. (2006) found a significant and positive effect of JP on JS based on agency theory. Whereas other authors demonstrated that the determinants of JS could vary in empirical research studies on account of different key variables.

By contrast, it has been said, since the 1930s, that JS potentially contributes to JP (Judge et al., 2001). For instance, Moqbel (2012) empirically tested self-proposed research hypotheses for different constructs, including SNS use intensity, JS, JP, and organisational commitment. Moqbel (2012) claimed that SNS use can increase employees' JS and emotional commitment to an organisation, and finally improve JP. Moreover, Moqbel et al. (2013) suggested that organisational commitment could "transmit" JS into JP.

Albeit the reciprocal relationship between JS and JP has evolved over the years, Davis (2001) proposed the well-known framework of the cognitive-behavioural model, which focuses on the important role of the cognitive component in the behavioural outcomes of pathological Internet use. Additionally, based on the social cognitive theory of Bandura (2001), Zhang and Zheng (2009) shed light on the psychological linkage between JS and JP, then they posited the direction of JS to JP. They argued that a higher level of affective commitment can act as a mediator, and that increasing the JS of employees within a traditional culture can help translate their emotional attachment into effort and better performance, especially in the Chinese context. By contrast, some scholars (Shepherd, 2011; Zheng, 2014) argued that problematic use of ESM would cause job dissatisfaction and then lead to loss of labour productivity.

For example, Zheng (2014) reckoned that attitude is a precursor to behaviour, thus psychological problems and lower JS have a direct impact on negative behavioural symptoms. In contrast, Lu et al. (2019) contributed a comprehensive analysis of influencing factors, relationships, predictors, and mediators of JS among the nurses. They revealed that the work climate and supervision are empirically significant for the JS of nurses.

Bakker (2015) applied JD-R theory to the public sector and argued that daily job resources, including technical support and skill variety, can boost workers' engagement and PSM, help workers to better handle organisational stressors, and positively impact daily JP. The findings of Chu (2020) provided a similar conclusion about the effect of ESM usage on the JS and JP of employees, through a comprehensive statistical summary of studies from 2009 to 2018.

In this regard, the current study is anticipated to empirically identify the determinant factors of JS for public workers in China, and provide suggestions for strategies on how ESM usage could positively contribute to work-related outcomes and organisational objectives (Feleki et al., 2021; Shang et al., 2023).

#### **2.4.5 Measurement of Job Satisfaction**

Measurement scales refer to instruments that are developed when a phenomenon can be understood through theoretical variables rather than direct assessment; the instrument comprises a collection of items that provide a composite score (DeVellis, 2016). Based on the diverse characteristics of JS, numerous studies have investigated a wealth of measures of JS, such as the five facets scale of the JDI, the MSQ (Weiss et al., 1977), JDS (Hackman and Oldham, 1974), and the global scale JIG (Ironson et al., 1989) in discriminable aspects of work (Alahmad et al., 2018). JDI is considered to be the most frequently used measure of JS and is designed to measure satisfaction with co-workers, the work itself, pay, promotion and supervision (Smith et al., 1969; Porter et al., 1974; Kinicki et al., 2002).

Since the MSQ scale is considered to be a reliable instrument to measure JS in the

context of the public sector (Moore, 2017; Çayak, 2021; Feleki et al., 2021), its short version of 20 items was adopted in the current research with some localised (Chinese) design. The short version of MSQ consists of three scales: intrinsic satisfaction, extrinsic satisfaction, and general satisfaction. This study adopts the general satisfaction scale with a five-point Likert-type scale to measure the JS of public employees. Thus, the degree or extent of satisfaction related to certain aspects of work can also be considered a subjective indicator of perceived goal achievement (Morris and Venkatesh, 2010; Aziri, 2011).

Since JS is a complex phenomenon with many affecting components and inconsistent findings in different cultural settings, various theoretical models have contributed to the author's knowledge of JS by attempting to establish a relationship between determinants of JS and SM usage (Charoensukmongkol, 2014). For instance, in the study of Moqbel et al. (2013), SM use intensity is measured using a modified version of Ellison et al.'s (2007) scale. Supervisor support can be measured using a five-item scale developed by Eisenberger et al. (1986). Co-worker support can be measured using a six-item scale developed by Tang (1998, cited in Charoensukmongkol, 2014). JS can be measured by a three-item scale developed by Cammann, Fichman, Jenkins, and Klesh (1983, cited in Charoensukmongkol, 2014). JP was measured in terms of subjective question scale adopted from Rehman (2011, quoted in Charoensukmongkol, 2014). All the mentioned constructs can be measured as latent variables of JS.

Although Diestel et al. (2014) proposed different definitions of external-focused and internal-focused JS, they only analysed the relationship between individual absenteeism and the satisfaction foci. Singh and Onahring (2019) categorised JS theories into content theories and process theories. Content theories focus on what really motivates employees at work by identifying their needs and objectives, while process theories are concerned with the variables of dynamic behaviours that make up motivation. Nikolaev et al. (2020) claimed that JS as a cognitive mechanism is associated with dispositional positive, negative affect, and the employment status of individuals.

In summary, JS is a complex and multifaceted concept that has different meanings for different people; thus, all these theories and the associated findings together could provide a basis to fully understand the nature of JS (Mullins and Christy, 2016). It is known that online reviews have become a valuable data source for business practitioners mining diverse information about corporate services and reputations in the era of rapidly growing Internet use. However, besides the mentioned survey-based metrics for researchers, the unstructured text of online reviews brings many complementarities to practitioners. From the latest point of view, measurement scales such as the MSQ and the JDI have been extensively utilised in existing surveys of JS; however, these survey instruments have some limitations, such as up-to-date scales. The capability of text mining methods to capture latent dimensions that affect employee satisfaction or relevant outcomes has been shown (Stamolampros et al., 2019). For some employees, reviews on sites allow them to express blunt and critical personal opinions voluntarily and anonymously, such as feelings of satisfaction or dissatisfaction with their job, company IT environment, or working issues (e.g., managerial behaviours). The lack of constraining survey items on review sites allows employees to reflect on their work experience online and argue about unveiling up-to-date preferences with the company (Stamolampros et al., 2019). However, it is virtually impossible for researchers to read a huge number of reviews manually and identify their thoughts about the factors around the established closed-form questions, but mining online reviews using a Python crawler can be one way of identifying reviewers' opinions and attitudes for primary factors (Jung and Suh, 2019). For instance, Luo et al. (2016) extracted anonymous employee reviews from Glassdoor to reveal the relation between employee satisfaction and company performance through data mining algorithms. They demonstrated the extraction of key categories and text analysis on employees' satisfaction, and revealed correlations between the online evaluation data set and corporate performance. Whereas Dabirian et al. (2017) used Watson, IBM's natural language processing and machine learning tool, to analyse 38,000 reviews on Glassdoor; their findings shed light on how to both motivate employers and engage



employees.

With regard to the current study, because of the particularities of public employees under investigation, there are few research studies in the western literatures on the measurement of Chinese users' JS. As the measurement scales proposed by Western scholars have a long history and have been considered reliable and valid for decades; thus, this study designed the JS scale on the basis of Western classic scales and integrated them with localised situations.

#### **2.4.6 The Concept of PSM**

Mullins and Christy (2016) argued that JS in a sociotechnical system is not only concerned with organisational structural and technological requirements, but also with the psychological effect on the human part and on the objectives of the organisation, and with the interactions between the psychological and social factors within the context. However, studies on how public employees develop motivations and how their motivations influence behaviours are limited (Castaing, 2006; Vandenaabeele, 2007; Perry et al., 2010).

Many previous studies have observed that the JS of public staff generally differ from that of their private sector counterparts (Bozeman and Rainey, 1998; Zhang et al., 2011; Steijn and Voet, 2017; Feleki et al., 2021). Public staff tend to be more interested in altruistic or ideological goals for the public, community, and society than in financial incentives. As House and Wigdor (1967) argued that achievement, job responsibility and advancement are more important than other causing factors to JS, the thesis seeks to reflect the intrinsic satisfaction of public employees in China, such as their core value, similar motivation, and behavioural pattern in common under the *DingTalk* phenomenon.

Perry and Wise (1990, p.368) introduced the concept of PSM and defined it as "an individual's predisposition to respond to motives grounded primarily or uniquely in public institutions and organisations". Furthermore, they categorised the motives of public service into three dimensions, which are rational, norm-based, and affective.

The definition of PSM was revised by Brewer and Selden (1998), and by Rainey and Steinbauer (1999), who all placed more emphasis on altruistic behaviours and their applicability beyond the workplace. Afterwards, the most recent and general definition of PSM is “the beliefs, value and attitudes that go beyond self-interest and organisational interest, which motivate individuals act out of a consideration of a whole entity’s requirements whenever appropriate” (Vandenabeele, 2007, p.547). Institutional identity is integrated into the updated definition, for example, employees can “feel a sense of duty or responsibility when they provide administrative service to the welfare of others and contribute to the common good of the community or society” (Perry and Hondeghem, 2008, p. 17).

Rainey and Steinbauer (1999) posited three forms of motivation: task motivation, mission motivation and PSM. High levels of these forms of motivation are linked with high effectiveness of public agencies. Crewson (1997) analysed the differences between public and private sector employees’ reward motivations, and concluded that PSM in the federal sector is more productive than economic-oriented motivation and more positively related to organisational commitment. However, Crewson (1997) did not develop a valid and reliable measure of PSM. Castaing (2006) suggested that PSM is an antecedent to organisational commitment, but no elaborate causal model was designed for the link. Furthermore, Vandenabeele (2007) introduced the person–organisation fit as a mediating variable to develop a supplemented institutional framework. Public values, such as public interest, compassion, self-sacrifice, customer orientation, democratic values, and good governance, are said to be internalised within an individual’s public service identity. Thus, various institutions and their PSM might impact on public employees with new identities in the institutional theory. For instance, Steijn (2008) emphasised the significance of PSM concept for public sector workers in a European context. Steijn (2008) additionally underlined that a high level of PSM contributes to greater JS and JP of employees, and they would be more engaged in their meaningful and valuable work in the public sector.

However, Bright (2008) claimed that a high level of PSM alone cannot guarantee compatibility and JS of employees in every public sector organisation, and the positive effects on compatibility may change over time. The findings of the study of Oktosatrio (2019) were consistent with the previous finding; they indicated that the obvious correlation between work–life balance and the JS of public employees can be mediated by the effect of PSM in the Indonesia context. Although PSM is said to be positively related to JS and to promote knowledge-sharing behaviours among Chinese civil servants in Hainan (Ding, 2019b), it cannot be regarded as the single most important indicator in other public organisations because of the one-dimensional survey and limited sampling population.

From the measurement perspective, Perry (1996) developed a scale with four component dimensions, which are commitment to the public interest, compassion, self-sacrifice, and attraction to public policy making. It was regarded as a valuable tool for public administration until Kim et al. (2013) revised it and developed an internationalised scale. Although Kim et al. (2013) tested this theoretical instrument of four dimensions and 16 items in 12 countries, PSM is still considered a complex and multifaceted concept, which could vary in different cultures and languages.

Hence, not only the antecedents and consequences of PSM should be acknowledged to differ from study to study when trying to measure PSM, but also its meaning and operationalisation in public institutions' contextual settings are needed via empirical analyses (Perry et al., 2010; Kim et al., 2013). The comprehensive literature review of Ritz et al. (2016) showed the most attention on JS, and they confirmed the positive relationship between PSM and JS, JP, and other constructs, such as employee–leader relations, certain job attributes.

Therefore, PSM research is valuable to understand the different motives of workers in the public sector in China, to develop appropriate incentive systems and make new public sector managerial suggestions.

## **2.5 Related Theories and the Relation to ESM**

With the disruptive development of ICT facilitating work practices and business activities anywhere and in many ways, traditional management in contemporary industry has confronted different challenges such as psychological issues, family-work conflicts, and boundary policies of organisations (Kossek et al., 2006; Wang et al., 2019). In recent decades, there has been increasing research interest and theories in diverse areas to explore the linkage between social organising and IT. They could help us to examine changes in tool use, organisational relations, strategical management through socio-technical interplay, theory of technology itself, and JD-R theory of employees, and then help us to explore the ESM phenomenon from a more holistic viewpoint.

### **2.5.1 ANT and Sociomateriality**

There are various related theories and research perspectives along with the fast development of science and technology, such as cognitive appraisal theory, social network theory, attitude formation theory, SM self-efficacy theory (Manroop et al., 2021), or SDT (Demircioglu, 2018). The theory with the most prominent groundwork in literature is ANT, which was originally developed by sociologists Michel Callon (1986), Bruno Latour (1987) and John Law (1992). From the ANT perspective, technological artifacts are considered to be equivalent participants in a network of human and nonhuman agencies that align to achieve a special effect. No matter the entity (human, technology, or process), all entities can be considered in a heterogenous network within which distinctions between human and nonhuman resources are dynamic and can be changed over time. Similarly, as Law (1992, p. 380) argued that, “society, organisations, agents, and machines are all effects generated in patterned networks of diverse (not simply human) materials”.

In exploring the sociology of organisations, the heart of ANT research is to find the generated institutional patterns in terms of power relations, organisational structure, and flows of information within the networks of the social. All human and nonhuman

actors are enrolled into the network, novel relationships, and links and behavioural models among people; thus, novel organisational patterns will replace traditional patterns. In the current study, the ANT theory helps the fusion of all aspects, which are the construction of every entity, relation, and actors. They can be within a methodological framework of associations in the heterogeneous context and the ontology of relativism on explaining the historical and reflective questions around the circumstantial network is adopted (Latour, 1996). In the process, the actions of individuals, the networks, such as various social institutions, and the interactions between actors like technology, rules, protocols, and working environment, are all primary research objects. What is more important, the underlying power and structure determined by collaborative components within the network need to be clarified (Muhammad and Wickramasinghe, 2018).

In response to the rapid diffusion of IT and the social impacts on skills and work quality, Dewett and Jones (2001) built on previous research, and highlighted the role of IT as a moderator in the effects of organisational characteristics on strategic outcomes through the achievement of information efficiencies and information synergies. Moreover, they called for a more “theoretically plausible” measure of IT and its role in a wide range of strategic organisational studies in future research. Seven years after Dewett and Jones (2001) called for a more theoretically plausible measure of IT, emerging research known as sociomateriality was proposed by Orlikowski and Scott (2008) from bountiful extant literatures that studied technological phenomena and optimal IT applications at different levels of organisations. Orlikowski and Scott (2008) contended that neither technological determinism nor social determinism completely captures the multiple changes brought by technology and organisations, and that the fluid and interactive relations need to be re-examined with a relational lens. Afterwards, they proposed the term “sociomateriality” to reveal the inherent inseparability between the technical and the social, which originated from ANT. The notion of sociomateriality distinguishes itself in organisational research by reconsidering the status of technology, to update investigations into contemporary organisational reality that cover strategic,

psychological, sociological, and technological fields. Under the umbrella term of “sociomateriality”, ANT-lensed research is conceptualised as a functional mechanism to analyse sociotechnical situations and interpret dynamic shifts and various actors across disparate networks (Cabiddu et al., 2014; Booth et al., 2016).

For example, on account of the widely growing use of ESM applications, especially considering the distributed, dynamic, and interdependent characteristics of the technology, the relations and boundaries between various humans and technologies, and the interactive practices that shape each other should be studied with an ANT-lensed perspective and approaches. In other words, since both humans/organisations and technology are assumed to be mutually dependent systems in the theory of sociomateriality, it is important to shed light on the material constraints and social context of the technology. That is to say, when employees routinely interact with people, they essentially interact with an ESM tool, which is of a material aspect. The changes that employees (human agencies) respond to will be reflected in their interactions with IT (Leonardi, 2011). That is, previous ways of doing work, the properties of the technology itself, contemporary institutional and social routines, and improvisation in the technological task at hand, all might change in the socio-material process along with of human and material agencies overlapping in organisations. The metaphor of overlapping is considered to be a way of recognising that human and material agencies can produce reciprocal changes in new routines or novel technologies through human’s perceptions of constraints and affordances in technologies (Leonardi, 2011).

In the context of ESM usage in the thesis, especially the influence of COVID-19 on reality, an ANT perspective helps us understand that the integration of humans, objects, and online interactions generate different responses and actions, which construct dynamic relationships and the environment (Ozuem et al., 2021a). Study on the affordances of *DingTalk* can provide an understanding of when, why, and how *DingTalk* enables outcomes in Chinese organisational practice. Thus, to understand the interweaving of its technology affordances, its organising of Chinese social institutions, and the features of *DingTalk* as “actants”, theory is needed to explain

what mechanism can enable workers better in the organisational context by the leveraging of ESM affordances in socio-material phenomena.

Therefore, the material properties of *DingTalk*, such as affordances and constraints of an application or an end system, are precisely those tangible resources that assist interplay between co-workers and non-human actors in new ways. In the current study, social constructionism is used to explore how the technology is socially constructed into relationships between human actors and their surrounding materials within heterogeneous networks (Restivo and Croissant, 2008, cited in Holstein and Gubrium, 2008). ANT, as a living theory, combines various mixed methods and other theoretical perspectives to afford a pragmatic lens for a researcher to analyse phenomena. As the data collection and analysis within an ANT approach are reflective and iterative for exploring evolving networks, ANT is useful for researchers to promote sense making and concept construction (Booth et al., 2016).

### **2.5.2 Theory of ESM's Affordances**

As mentioned above, Gibson (1977) offered a definition of “affordances” and explained the relationship between materiality and affordances in 1986. General technical features contribute to new forms of work behaviours, such as organisational microblog, video conferencing, and communal record functions within an IT-intensive world. The notion of affordances does not focus on any particular technology, but on the value of the outcomes of communicative practices and evolution of information processes.

Similar to the view of Gibson, Hutchby (2001) argued that the affordances of a technology can present a variety of possibilities for interactions, and furtherly set constraints on different given occasions because affordances are both functional and relational. Zammuto et al. (2007, p. 752) referred to affordances at an organisational level, and argued that the intersection and evolving process between IT and organisations is an *affordance of organising*, which represents the result of combinations of technology and organisational features continually affecting

organisational form and function.

Furthermore, Leonardi (2011, 2018) proposed that affordances and constraints of technology are constructed and incorporated with notions of human and material agencies. People actively construct perceptual affordances and constraints when they intend to achieve a certain goal with the materiality of a technology. Human agents would execute their work in practice, experience the material agency of the artifacts, and then distinct outcomes, such as flexible routines and technologies, would change through human and material agencies under different contexts.

Many studies have identified different classifications of technology affordances, and explored the relationships of ESMs' affordance and its context in a specific research method, as shown in Table 2-1 on next page. The table was adapted from Sun et al. (2019).

In the Table 2-1, Zammuto et al. (2007) proposed five affordances of SM to characterise the IT–organisation relationship, and created a new form of organising, which are: visualising entire work processes, real-time/flexible product and service innovation, virtual collaboration, mass collaboration, and simulation/synthetic reality. The study of Boyd (2010) also provided a pioneering research on the potential interactions between a technology's functionality and an organisational context, by four affordances: scalability, searchability, replicability, and persistence. While Faraj et al. (2011) proposed three other ones, and emphasised "reviewability" for content review and management over time. "Recombinability" refers to the ability of the ESM tool linking to creating innovative ideas, and "experimentation" encourages the trying out of new ideas. Moreover, Faraj and Azad (2012) proposed that the way to bridge the technology in an organisation and the materiality is through the lens of affordances. Treem and Leonardi (2012) proposed four ESM affordances (Visibility, persistence, editability, and association) and claimed that these four SM affordances may alter socialization, knowledge sharing, and power processes in organisations. Persistence affordance reveals the ESM's capability to allow employees to access digital content permanently. Visibility affordance refers to ESM's ability to present



information easily. Editability affordance refers to ESM's ability to allow employees to modify, add, or delete digital content generated online. Association affordance represents the social connections between employees enabled through ESM technology.

Table 2-1. Existing studies of affordances classifications

Pioneering Study	Methodology	Technology Affordance	Organisational Context and Individual
Zammuto et al. (2007)	Conceptual	Visualizing work processes, real-time product & service innovation, virtual collaboration, mass collaboration, and simulation reality	×
Boyd (2010)	Conceptual	Scalability, searchability, replicability, persistence	×
Faraj et al. (2011); Faraj and Azad (2012)	Conceptual	Reviewability, re-combinability, experimentation	×
Treem and Leonardi (2012)	Conceptual	Visibility, persistence, editability, and association	×
Leonardi et al. (2013)	Conceptual	Leaky pipe, social lubricant, echo chamber	×
Majchrzak et al. (2013)	Conceptual	Meta-voicing, triggered attending, network-informed associating, and generative role-taking	√
Gibbs et al. (2013)	Case Study	Display updates, signal availability, selectivity	√
Oostervink et al. (2016)	Case Study	Associating, visibility and persistence, notified attention and selectivity	√
Kane (2016)	Conceptual	Digital trace; transparency; ubiquity	×
Rice et al. (2017)	Empirical	Pervasiveness, editability, self-presentation (or identity management), searchability, visibility, and awareness of different contexts	√
Sun et al. (2019) Sun et al. (2020)	Conceptual, Empirical	Reviewability, Editability, Association, Notified attention, Pervasiveness	√
Song et al. (2019)	Empirical	Proximities, human relationship, social interaction, and flows	√
Shao et al. (2020) Pitafi et al. (2023)	Empirical Empirical	Interactivity, information, and navigation Visibility affordance	√ √

Thus, Leonardi et al. (2013) provided three classic metaphors to define technology's affordance as "Leaky pipe, social lubricant, and echo chamber". This can be considered a relational approach to understanding the organisational changes induced by communicative activities between the social and the material. In line with

Leonardi's theory, Majchrzak et al. (2013) argued that technology affordance should be leveraged to expand extant social and organisational theories. They not only identified four affordances of SM in Table 2-1, but also explained the interactions through which these affordances engage online knowledge communal conversation. Empirically, Gibbs et al. (2013) explored strategic technology use in a case study set in a high-technology start-up; they highlighted the dialectical tensions of SM's affordances for knowledge sharing, communication, and covert behaviour. Likewise, Oostervink et al. (2016) advanced understanding on how ESM's affordance can both facilitate and impede knowledge sharing in an IT consultancy. It is essential to illustrate the coping practice for ESM use from an institutional logics perspective. Kane (2016) summarised three affordances of evolving SM over the past 15 years, but only for organisational knowledge management conceptually. Rice et al. (2017) conducted a survey in a Nordic public sector broadcasting company and comprehensively identified six organisational media affordances (Table 2-1). They inspiringly indicated that technology affordances would improve and change over time, and, in turn, the dynamic relationship between people and media would affect the environment.

Based on a review of prior literatures, Sun et al. (2019) explicated the positive and negative influences of technology affordances on knowledge sharing, and integrated the mechanisms into an overall framework involving individual goals and organisational context. They specified the negative effects of ESM usage, such as information overload, communication overload, social overload, groupthink, and privacy invasion, which were overlooked by prior studies. Furthermore, beyond the theoretical concepts, Sun et al. (2020) empirically studied 365 Chinese *DingTalk* users to explore the links between ESM affordances and their creative performances. However, the study was limited in measuring the technology affordances as association, visibility, persistence, and editability from prior literature, which are not entirely fit for *DingTalk* in a Chinese context and respondents' perceptions. *DingTalk* contributes to facilitating knowledge acquisition and creative thinking by the positive influences of these affordances, but the two-sided impacts of affordances have not

been clarified in the model's results.

The research of Song et al. (2019) compared the technical affordances of *WeChat* and *DingTalk* in a Chinese financial firm, and distinguished work-oriented and socialisation-oriented SM in terms of flexibility affordance in team activities and supported ties in instrumental value. They argued that the affordances of technology may vary depending on an individual's activity and an organisation's context even if it has the same features or functions. Likewise, the study of Shao et al. (2020) empirically identified three technology affordances (Table 2-1) that could have an impact on different users in a Chinese college and lead to different levels of user satisfaction and behaviours. Through mediating role of knowledge transfer, the communication visibility affordance of ESM is found significantly to improve employee agility performance (Pitafi et al., 2023). Although the work-related affordances of *DingTalk* are thought to be relatively fixed in a specific context, the negative influences of affordances are not considered for users and firms in these studies.

Thus, affordance is a powerful concept in the analysis of diverse sociotechnical phenomena; adopting an ESM affordance perspective is of great significance for incorporating ESM features and IT identity into work-related outcomes under different organisational contexts (Alahmad et al., 2018; Mengli, 2021). Therefore, affordance theory can help us not only to understand the technology itself, but also to conceptualise the dynamic process by which IT and organisations evolve together over time.

From an ANT perspective, the sociotechnical affordances of ESM enable employees to do current work in a more efficient or effective way, and to contact more and more outsiders of the organisation; in addition, information is transformed into a novel form of communication and has broad implications for the nature of work (Pitafi et al., 2023). These changes in roles or relationships of workers will lead to the transformation of social networks, work practices, and the structure of an organisation. For instance, ESM usage is thought to change the hierarchy structure of firms into collaborative and team-based networks (Karoui et al., 2015; Looy, 2016;

Chan et al., 2019). Furthermore, the features of an ESM tool need to be better designed to meet users' needs or organisational requirements in contemporary society, which could in turn lead to new social structures.

### **2.5.3 Theory of JD-R**

The JD-R model was proposed by Demerouti et al. (2001); it categorised two key dimensions of working conditions as job demands and job resources, and analysed their correlations with work burnout. Job demands refer to those physical, psychological, social, or organisational aspects of a job, which require constant physical and/or psychological effort (Schaufeli and Bakker, 2004, p.296). Job resources indicate the associated physical and psychological costs of a job, which can be functional for work goals and benefit personal growth, learning, and development (*ibid.*). For instance, increasing job resources can enhance an individual's engagement, while high job demands may lead to exhaustion, disengagement, and turnover, especially for a specific occupational group. So, engagement is considered to mediate the relation between job resources and JP in the JD-R model. In addition, each occupation has distinct characteristics, even different departments and job positions that may have different resources, social support, and high-quality relationships. These emotional supports can mediate or buffer strain and motivation of employees (Bakker and Demerouti, 2007). Since job engagement and job burnout, as two opposite poles, have different patterns of possible reasons and consequences, various intervention strategies should be adopted to improve the former or reduce the latter (Schaufeli and Bakker, 2004). Based on the previous JD-R model, Xanthopoulou et al. (2007, 2009b) expanded the model by testing the significant role of personal resources in the forms of OBSE (organisational-based self-esteem), optimism, and self-efficacy; these personal resources tend to have more plasticity for individual's psychological well-being in work-related practices, differ from fixed personality traits. The stronger the motivating potential of job and personal resources, the better the performance and engagement

of employees in daily work. Furthermore, they clarified five types of job resources (social support, autonomy, performance feedback, supervisory coaching, and professional development) as well as three work engagement components (vigour, dedication, and absorption). Hence, resourceful work environments and creative training programmes are suggested to enhance employees' positive self-beliefs for organisational management. Although the JD-R model defines simple and flexible descriptions of the associations between job demands, resources, personal psychology, and organisational outcomes, it does not provide explicit psychological explanations or clear positions on the integration of demands and resources in specific conditions; in addition, it does not provide a framework for possible antecedents of occupational well-being and strategic management in organisations (Schaufeli and Taris, 2014). Nevertheless, the JD-R model can still be considered a heuristic model for accommodating new ideas and future development of the model. Schaufeli (2015) integrated engaging leadership into the JD-R model using SDT, and confirmed that leadership has a direct relationship with performance behaviours and an indirect impact on employee well-being. It appeared that the key role of an engaged leader is to inspire subordinates and provide a favourable work environment for employees' beneficial outcomes (Wang et al., 2023). Following the logic of JD-R theory, Schaufeli (2017) developed an online survey tool "the Energy Compass" to increase employees' resources and reduce the demands on them. Under the conceptual guiding principles of the JD-R model, an online platform has been implemented in an organisational development project and proven its practical function of increasing work engagement and preventing burnout across organisations.

Although the JD-R model was usually applied in a traditional work context, it is relevant to apply it to the context of ESM platforms because it could bring new implications for the theoretical framework and practices (Palmisano, 2021). For instance, an ESM tool can be considered a kind of job resource that helps employees to acquire more support, while it also brings various job demands to be coped with (Liu et al., 2023). That is, a job resource and a job demand could be two sides of the

same coin (*ibid.*). How the JD-R model could work in contemporary public organisations using a specific *DingTalk* platform to increase engagement and reduce burnout of employees is to be examined. This needs a new systematic re-conceptualisation of all relevant constructs and practical interpretation of the theory.

## **2.6 Summary**

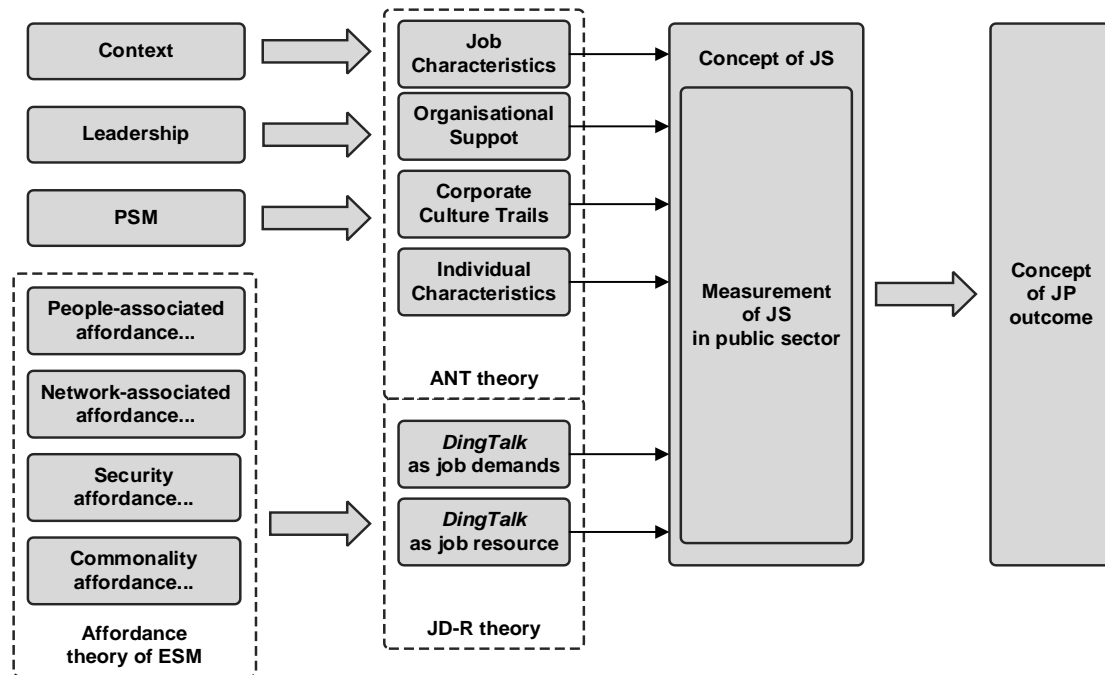
The fundamental aim of this chapter was to understand and assess the relevant concepts and theories through a systematic review of numerous literatures. Firstly, the concepts of SM and ESM were clarified, and then the taxonomy and affordances of the ESM technology were studied from academic findings, including the strengths and challenges of using ESM that affect users and contemporary institutions.

It is well known that JS is a complex and multifaceted concept and the study of JS has been prevailing in the OB research for several decades. Various studies on JS with different definitions and theoretical models were discussed and a wide range of factors are considered as antecedents of JS.

Whereas, this study intends to identify the significant roles of job conditions, organisational support, personal characteristics, and corporate culture traits in determining JS of public employees in China, and further investigate their influencing extents on well-beings of *DingTalk* users.

Based on literatures, the initial conceptual model of our study can be summarised as follows.

Figure 2-1. Conceptual model from literatures



Since some existing studies argued that the motives and corporate cultural context of public employees differ from that of private enterprises, the influence of context, leadership and PSM will be explored in this study. Meanwhile, there is inadequate discussion on the causal relationship between bilateral influences of *DingTalk's* technology affordances and public employees' JS in China. Therefore, from the JD-R and affordance theory of ESM, the current study aims to empirically explore the impacts of *DingTalk* affordances on various measure factors of public users' JS. The perspective of sociomateriality of ANT can help us understand ESM technology and organizing better (Leonardi, 2013) by integrating their perceived JS within specific context and their behavioural changes in organisations.



## Chapter 3. Research Methodology

### 3.1 Introduction

The previous chapter reviewed the distinctive concepts of SM and ESM, and examined the definition and antecedents of JS, especially the four main determinants of JS: job characteristics, individual traits, organisational support, and corporate culture. Since this study specifically investigates the *DingTalk* phenomenon within public establishment in China, the primary stakeholders of this work are all *DingTalk* users in public institutions, among whom our participants are selected from voluntary employees, leaders within different chosen organisations.

The chapter starts by laying out the research philosophy of constructionism where the ontology, and epistemology guide the methodological design of the phenomenological research. Then it outlines how the sequential mixed methods designed with a constructivism stance, from interview questions to questionnaire planning. Afterwards, section 3.3 describes the entire process for conducting two mixed methods sequentially, especially how data collections were implemented in terms of in-depth interviews and online survey. On each stage of qualitative and quantitative method, the pilot test, sampling procedures of participants, formal execution and assessment for each approach are examined separately for ensuring validity and reliability. At last, the researcher's reflexivity and ethical considerations during the research process are outlined.

### 3.2 Research Paradigm

The concept of paradigm was developed by Thomas Kuhn in his influential book called *The Structure of Scientific Revolutions*. It refers to a set of beliefs with which scientists make sense of the world, and it sets the boundaries and parameters for scientific research (Kuhn and Hacking, 2012). The set of beliefs are about ontology (the nature of reality and its characteristics), epistemology (the perspective of knowledge and subjective evidences), axiology (the values and biases of an inquirer in research), and methodology (the procedures of investigation) (Creswell, 2013). As

Clarke (1999) noted, four key elements relevant to knowledge construction are: questions of ontology, and matters of epistemology, general methodology, techniques for data collection and analysis. The first two elements address practical solutions to knowledge construction, and the latter two emphasise the philosophical assumptions guiding the research inquiry.

Therefore, each paradigm contains several key dimensions, including ontology, epistemology, and axiology, which all belong to the philosophical assumptions; thus, based on the philosophy and a series of theories, a researcher can determine the choice of methodologies under the paradigm. Drawing on the work of Kuhn and Hacking (2012), Patton (2015, p. 153) claimed that paradigm is not only “a worldview, a way of thinking about and making sense of the complexity of the real world”, but also a norm to legitimate the methodology and methods for the practitioner. Since each paradigm contains different theoretical perspectives, philosophical assumptions, methodologies, and methods (Crotty, 1998), researchers need to understand the paradigm clearly, regarding the research objects, then identify suitable methodologies to proceed with their research.

According to Guba and Lincoln (1994), four major paradigms in scientific inquiry are: Positivism, Post-positivism, Critical theory, and Constructivism. Positivism addresses “reality” as an objective existence external to and independent from individual cognition and subjective consciousness; it chiefly employs quantitative methods (Cassell et al., 2018). Thus, it is not fit for what this thesis tries to present. Post-positivism takes a scientific approach to research; it believes in cause-and-effect elements based on a priori theory, in which qualitative research can often play a supportive part in quantitative research (Creswell, 2013). To some extent, it can be considered an extension of positivism, because it considers the world as objective and answerable, but the answer is conditionally dependent. In this thesis, some extensive information from the perspective of post-positivism is provided, including the emergence of *DingTalk*, its strengths and weaknesses, and its impact on behaviours. However, qualitative inquiry plays a leading role rather than a supporting role in understanding the beliefs and assumptions related to *DingTalk* usage,

considering the various variables associated with the development of socio-technical phenomena, perceiving different psychological knowledge of employees in a Chinese setting. Critical theory perspectives are always concerned with social institutions and their transformations through empowering human beings and changing the constraints of race, class, and gender. The value-determined nature of critical theory is not suitable for this current study. Differentiated from the other three paradigms, the constructivism paradigm moves from ontological realism to ontological relativism (Guba and Lincoln, 1994). In social constructivism, the goal of research is to reconstruct or understand individuals' multiple, subjective experiences and views, which is an improved and sophisticated interpretation by inquirers under historical and cultural norms (Creswell, 2013). Thus, this thesis not only allows different employees to describe their own experiences, perspectives, and psychological JS in relation to *DingTalk* usage, but it also addresses the interactions among individuals, technology affordance, and the Chinese context of the public sector. How the researcher perceives the reality, organisation, and ESM technology from the participants' personal, cultural, and historical experiences to shape the interpretation of the current research is a precondition for establishing a social construction of a technology framework (Holstein and Gubrium, 2008). Reflexive thinking about the researchers' own experiences and awareness of sustained connections between the researcher and participants are also incorporated into the perspective of constructivism in this qualitative study (Creswell, 2013).

Thus, this research adopts a primarily qualitative approach and the philosophical stances of the constructivism paradigm to explore the essentials of a phenomenon and construct explanations of multiple realities involving the researcher's interpretation. Moreover, in line with the philosophical foundation, the researcher and practitioners can collectively address the first two research questions in this study.

### 3.2.1 Research Philosophy

Since this study investigates the ESM technology *DingTalk* as an emergent phenomenon, all the data, viewpoints, and meaning-making in the current study are created through constant interactions between the investigator and respondents, which is in accord with social constructivism (Guba and Lincoln, 1994). The outcome of knowledge in this research is determined and framed by the researchers' ontological, epistemological, and other stances (Vagle, 2018).

The term ontology is from two Greek words; "onto" means "being" and "logia" means "science, study or theory" (Antwi and Hamza, 2015). Ontology originated from a branch of philosophy concerning the nature and structure of the world, and it refers to a way of defining reality of the research, whether it is an assessment, a solution, or a physical organisation. Since there are multiple social realities and experiential stories represented by employees, a relativist ontology is assumed in the current study (Guba and Lincoln, 1994).

Epistemology indicates the process through which the researcher gets to know the reality and creates knowledge. It contains not only knowledge, theory, and understanding of the phenomenon, but also how the social actors explain themselves as practitioners (Crotty, 1998). Objectivism implies that social phenomena are an independent reality and external facts beyond reach; by contrast, subjectivism asserts that people's perceptions and resulting actions can make a social reality (Bryman, 2012). The latter is more suitable for the current research.

According to Crotty's theoretical perspective, constructivism reckons that all knowledge and meaningful reality are contingent upon human practices, which are constructed in and out of interactions between human beings and their world, and developed and transmitted within an essentially social context (Crotty, 1998, p. 42; Samra-Fredericks, 2008). The notion of constructionism is often thought of as a replacement for constructivism and these two words can be used interchangeably by sociologists since the differences between two terms are not definitive (Holstein and Gubrium, 2007). Constructivism places more emphasis on meaning-making and

active interaction of an individual's mind in relation to their environment. Whereas, constructionism focuses more on the production of knowledge, the construction of something useful, liberating, and fulfilling, and rewarding interpretations (Jawad, 2018). Some debated that Constructionism is applied more in socially centred usage, and Constructivism seems more popular in fields with high-culture overtones (Holstein and Gubrium, 2007). Some argued that the subtle nuance between them is related to social interaction processes. Constructionists create a world while constructivists increasingly reflect on individual cognitive processes (Young and Collin, 2004).

Both social constructionism and constructivism consider that knowledge from diverse constructions of reality may change depending on people's interpretations and language. Thus, it is often described as interpretivism (Creswell, 2013). The world and objects are meaningless until human beings engage with the "world stuff", and then actual meaning emerges from the interpretive emphasis (Denzin and Lincoln, 2007).

This study focuses on identifying the complex impacts of the novel technology ESM and reflecting on the dynamic reactions of human beings in varying organisations, which represent a reality constructed by different perspectives and different groups in the organisation, and the worldview of the researcher (Schwandt, 1998). It is consistent with the constructionism stance on sociological theory and reasoning (Restivo and Croissant, cited in Holstein and Gubrium, 2008). Therefore, this thesis adopts social constructionism in social science as its epistemological stance, and sheds light on the *DingTalk* phenomenon from diverse perspectives of experienced participants, reforming understanding of significant associations between humans and technology.

From the axiological perspective, value plays a significant role in ethics of inquiry, and that value during the inquiry affects what the researcher chooses to investigate, what to find and how to interpret it (Johnson and Onwuegbuzie, 2019). It is crucial for a social constructionist to identify and decide from a wealth of information what is important within the multiple-constructed realities; that also rejects value-free

axiology (Ozuem et al., 2021b). For this study, the values can be divided into two levels, one is the collectivist strand of Chinese culture from the national level, while the other is specific corporate culture from an organisational level. Thus, both values are taken into consideration to understand the characteristics of respondents and the corporate cultural environment; they will influence the research decisions of the investigator during the enquiry process as well.

With the evolution of paradigms in the past decades, pragmatism is known of pluralism which incorporates the strengths of both methodologies in more dynamic and processual ways in the research context and questions (Onwuegbuzie and Leech, 2005; Cassell et al., 2018). Pragmatic mixed method distinguishes its approach from purely quantitative approach, which is based on a philosophy of positivism, and from a purely qualitative approach, which is based on a philosophy of constructivism (Guba and Lincoln, 1981; Denscombe, 2008). Furthermore, pragmatism is argued to be the most useful philosophical partner supporting mixed approaches, which allows constructivism and positivism (Johnson et al., 2007). In the current study, to address the research questions, not only the different JS attitudes under the emergent *DingTalk* phenomenon, but also the strengths of their associations are to be explored in this enquiry. Both quantitative and qualitative techniques are integrated in a pragmatic mixed approach to collect multiple data resources and diverse perspectives, and to gain complete understanding of a phenomenon. Within the pragmatist tradition, abduction can be defined as a process of reasoning back from the diverse employee's behaviours to probable antecedents or causes (Denzin and Lincoln, 2018), so that the patterns of JS and plausible implications of a phenomenon can be explored and tested in the subsequent conclusions.

Therefore, a pragmatic mixed methods approach with a social constructionist stance can utilise any findings reasoned from qualitative or quantitative techniques, which are both defensible and usable in social research (Johnson et al, 2007). A mixed methods approach can not only develop some insights into the JP and JS of employees during *DingTalk* usage, but also identify the significant strengths of

determinants of the JS and other important factors in Chinese state-owned institutions.

### **3.2.2 Phenomenological Research**

Creswell (2013) identified five sophisticated traditions in qualitative research, which are narrative research, phenomenology, grounded theory, ethnography, and case study. One of the main intellectual traditions is phenomenology. The discipline of phenomenology began at the beginning of the 20th century when Edmund Husserl published *Logical Investigations* (1900–1901). Husserl developed phenomenological research with an emphasis on psychology and philosophy in human sciences. Husserl advocated that consciousness is always towards an objective or something; “intentionality” essentially focuses on the interaction between subject and object in a variety of contexts, horizons, and behaviours. Thus, meaning creation is inherently from a social process rather than from an individual process (Vagle, 2018). As a kind of interpretivism (or constructivism), phenomenology emphasises “back to things themselves” (Crotty, 1998, p. 78). It refers to the study of describing the common meaning and essential nature of the thing for individuals when they universally experience an event. It is a discipline that considers what individuals have experienced, how individuals make sense of the world, and how researchers describe the phenomenon with their own preconceptions (Bryman, 2012). In this way, the phenomenologist does not set out to study individuals but to craft how a particular phenomenon manifests and appears in the real world (Vagle, 2018).

In extant studies, two leading types of phenomenology are engaged in different methods and practices (Van Manen, 2017): (1) empirical, transcendental, or psychological phenomenology (Moustakas, 1994); and (2) interpretive or hermeneutic phenomenology (Van Manen, 1990). Moustakas (1994) argued that transcendental phenomenology and psychological phenomenology focus more on description of individuals’ experiences rather than on the interpretation of the

researcher. Besides, in the transcendental approach, investigators try to remain neutral and objective by bracketing out their personal experiences. In the tradition of transcendental phenomenology, the researcher is more inclined to experience suspension, and combine just subjective experiences of participants' condition and context in form of a structural description to convey an overall unbiased experience (Creswell, 2013). By contrast, hermeneutic phenomenology is the art of understanding and interpretation. It involves two aspects, empathy, and questioning. From an inside view, a researcher needs to understand and faithfully disclose the experiences of participants, but a researcher also needs to take an outside view to question, assess, and interpret latent meanings in one's own perspectives (Bazeley, 2013). For a constructionist, thinking for being does not merely enable various understandings of "actuality", but also preserves ontological possibilities for existing in and interpreting the world with self-awareness (Heidegger, 1962).

Regarding the questions of the meaning of being in this study, fundamental ontology determines the selection of ESM phenomena, proceedings of data analysis, and how to understand problems. Through overthrowing the previous meaning of things, the researcher needs to constantly reflect and criticise phenomenology itself. Moreover, based on descriptive phenomenology, hermeneutic phenomenology is a kind of reproduction from the original experience in the process of long-term attention (Creswell, 2013).

Thus, a good phenomenology researcher should not only be critical but also reflexive. Other concerns are recognition of historical distance, human culture, and language, to interpret the textual experiences and develop new meaning of each phenomenon (Moran, 2002). Taking an overview off the literature (Van Manen, 1990; Moustakas, 1994; Creswell, 2013), significant features of phenomenological study include following points:

- 1) Identification of a specific phenomenon arousing "abiding interest" and it is often phrased with a single idea, or concept.
- 2) Identification of a heterogeneous group who have all experienced that specific phenomenon, with a size from about 3 to 15.



- 3) Researchers of hermeneutic phenomenology bracket themselves into the study and especially focus on the participants' experience in the study.
- 4) Interview is the prime data collection method; sometimes other sources of data may be used.
- 5) Systematic procedures will be adopted in data analysis, generally analysing from narrow units to bigger units, and then finally to a composite description of what and how participants have experienced it.

To sum up, the current study follows a hermeneutic phenomenological approach with bracketing the researcher's views into the qualitative research.

In this study, not only general knowledge of variables of "individuals, groups or events" in the ESM phenomenon, but also their relationships and representative behaviours related to *DingTalk* use in chosen organisations will be identified. The integrated interpretation of ESM within each chosen public institution (case) and a heterogeneous group of chosen public institutions (cases) in the public sector can provide unique and rich information within cases for the whole phenomenon (Patten and Newhart, 2018). In this way, the current study follows hermeneutic phenomenology, incorporates a constructionist perspective, and examines the *DingTalk* phenomenon pragmatically and holistically with mixed methods. A typical method of gathering data in phenomenology is conducting interviews, during which a researcher infers motives and reasons behind different behaviours and attitudes by qualitative inquiry (Hammersley, 2008). General questions and subtle data are used to co-construct meanings and contribute to a final description of participants' shared experiences. As for the process of data analysis, personal statements and sentences are identified into different themes, then presented with a combination of the textual (i.e., what participants experienced and responded) and structural descriptions (i.e., what institutional contexts are in the public sector in China) of the overall essence of ESM related to JS. Therefore, a final composite explanation and deep understanding of the features of the *DingTalk* phenomenon, its essence, can be used to improve business practices or policies in the further studies.

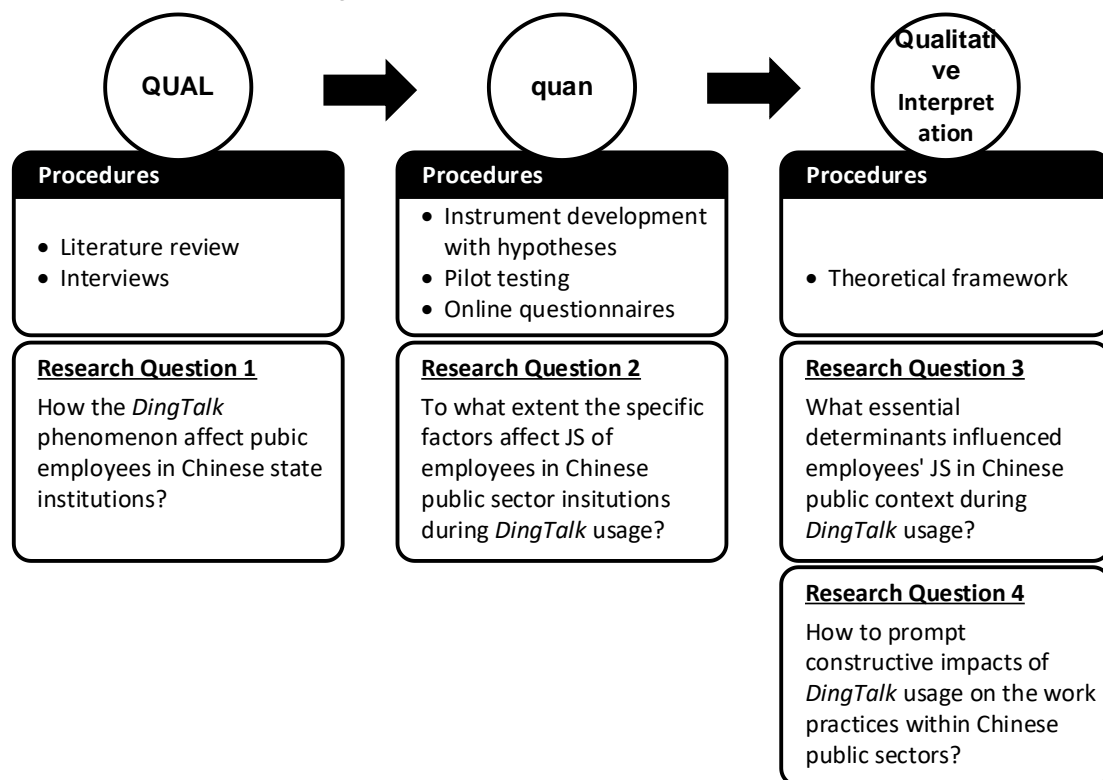
### 3.2.3 Methodological Design

It is well known that mixed methods research provides guidelines for identifying different forms of inquiry activities and integrating alternative procedures appropriately to collect qualitative and quantitative data in several disciplines, such as health education, nursing, psychology, and behaviour science (Teddlie et al., 2008; Creswell and Creswell, 2018). Combining qualitative findings with quantitative statistics, and integrating the strengths of mining both databases, mixed methods can produce more persuasive accounts of the phenomenon of interest, and help bridge the gaps between research and practice (Hesse-Biber and Leavy, 2008). Lincoln and Guba (1985) indicated that a “fragmentable” reality could be broken into independent variables (IVs) and processes; thus, the pieces have been studied independently of each other. Morse (1991) developed a notation system and illustrated several types of mixed methods, for example, an arrow (->) indicates the sequence of data collection, capitalization (e.g., QUAN, QUAL) implies major emphasis, and lowercase letters (e.g., quan, qual) indicate less emphasis and priority. Mixed model designs have been routinely categorised into *simultaneous* and *sequential* (Creswell et al., 2003). In exploratory sequential mixed design, the qualitative and quantitative methods of the study occur in a chronological order based on different data findings in preceding phase. Generally, it starts with a qualitative exploration of concepts and then is followed by instrument development (or quantitative features). Afterwards, in the third phase, the investigator can administer the instrument features to describe a sample of a population (Creswell and Creswell, 2018).

From the perspectives of phenomenological research on *DingTalk*, this research design provides a three-phase procedure to conduct quantitative and qualitative methods, and take qualitative inquiry as the core (Guba and Lincoln, 1981). In this case, qualitative data was collected at the initial phase, and the aim was to explore broad viewpoints on JS and JP of *DingTalk* users in Chinese state-owned organisations. After analysing the findings from first phase, the qualitative results helped identify appropriate variables or primary constructs, and to build an instrument

for the follow-up quantitative phase with hypotheses. This was a vital procedure for moving from qualitative data analysis to scale development, including constructing validity, and reliability estimates (DeVellis, 2016). Then in a second phase of quantitative method, data were collected from employees to gain concrete opinions on the extent of various factors impacting on employees using *DingTalk*. The quantitative data were statistically analysed about the significance of each component. Since a sequential exploratory design with a social constructionist stance was undertaken to investigate the technological phenomenon in depth, the priority of addressing research problems was undertaken using a qualitative approach (Yin, 2016b; Denzin and Lincoln, 2018; Cassell et al. 2018). Finally, the findings of this enquiry were interpreted in the final phase with integration of multiple data resources from phases one and two. The purpose of this mixed method was to complement qualitative description (e.g., phase one) of the *DingTalk* phenomenon with quantitative data results (e.g., phase two).

Figure 3-1. Sequential design of mixed methods



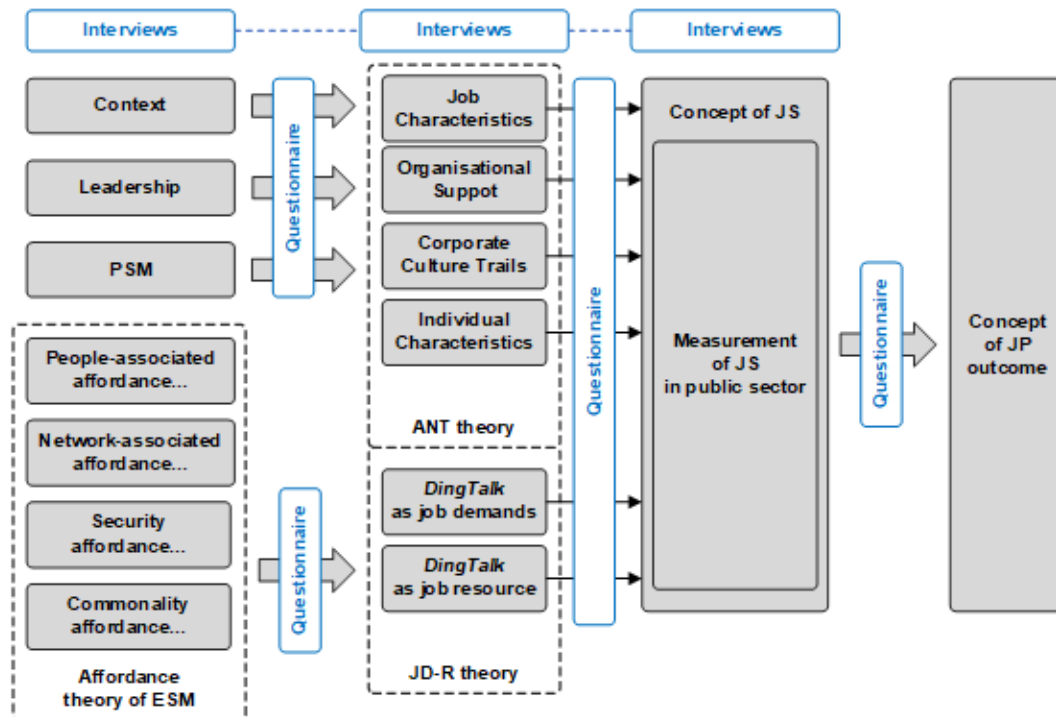
To sum up, the current study adopted the sequential design of exploratory research is notated as above (see Figure 3-1): QUAL+ quan + QUAL (Creswell et al., 2003; Creswell and Creswell, 2018; Guetterman, 2015).

In contrast to a traditional singular method, exploratory sequential mixed methods can provide a better complementarity as there are disparate inquiry components to address the research questions; the breadth and range of the phenomenon investigation can be developed and expanded by using different methods sequentially (Johnson and Onwuegbuzie, 2019). Moreover, mixed methods with a constructionist stance can offer a fusion of approaches to this study, a thematic analysis provides a profound description for the qualitative inquiry (Sekaran and Bougie, 2019; Creswell, 2018).

The mixed methods approach is a sophisticated, complex approach to address the research questions of the current study and to completely understand the problems in an evolving Chinese institutional context. Undoubtedly, some methodological issues emerge during the use of mixed method approaches, such as conflicting results and intervention design; thus, researchers should recognise some preconceived biases and evaluate the validity, or the “legitimation” (Johnson and Onwuegbuzie, 2019).

When a mixed methods inquiry is designed, integrating qualitative and quantitative procedures is an issue, as is whether or how to use triangulation during the process (Johnson et al., 2007). More and more scholars are prone to utilising triangulation for complementary purposes, and to increase the scope, depth and consistency of results and procedures in the data interpretation of qualitative research (Morse, 1991; Flick, 2007). In the current inquiry, albeit there are multiple data resources, the interviews and questionnaires are integrated with limited mutual confirmation. The conceptual model with mixed methods is designed as below.

Figure 3-2 conceptual model with mixed methods design



Thus, the sequential mixed methods occur in this study when the results of the interviews are gathered for the quantitative survey in the first stage; the result of questionnaire survey assist secondly in the explanation of relations among relevant concepts.

No matter the use of either multiple quantitative or qualitative approaches, or using both quantitative and qualitative approaches, triangulation is the simultaneous display of multiple, refracted realities (Denzin and Lincoln, 2018). Triangulation is the combination of methodologies in a study of the same phenomenon; the outcomes of triangulation can help a researcher to construct an explanation for a social phenomenon (Denzin and Lincoln, 2018). However, some scholars found it hard to define triangulation from a qualitative research perspective in each paradigm (Barbour, 1998; Hammersley, 2008). Under this condition, mixed methods reject triangulation and pay more attention to data findings, which is primary and which is supplementary, as suggested in Jawad (2018).

### **3.2.3.1 Design of Semi- structured Interviews**

From the aspect of schedule or guiding approaches to qualitative interviewing, there are two major forms: unstructured and semi-structured interviewing. An exploratory interview is usually started with some pre-planned design; thus, this study is an illustration of semi-structured interviewing. Different from the unstructured interviewing, semi-structured interviews need some structure to focus on the research objectives clearly with a list of questions, and to ensure cross-case comparability of different organisations for this thesis. Besides, the range of topics is widely open to any responses, and the whole interview programme is not limited to pre-determined question design, rather, it permits participants to reflect on their experiences and co-construct the nature of “subjective reality” with the interviewer flexibly (Young et al., 2021).

Therefore, the whole design process of the semi-structured interview questions, from related literatures to relevant theory and to research objectives, can be referred from the Table 3-1.

First of all, raised from previous literatures and four research objectives, based on the related theoretical foundation, many questions were presented. But some primary questions seemed too long or too narrow in scope, which might constrain the participant to short and quick answers with little space to develop. Afterwards, these questions were shortened into one-liners. During the design process, the doctoral supervisors provided some relevant suggestions for the interview questions. Then tracing and probing questions were refined to engage informants for more details and examples. Additionally, more open-ended questions and encouraging phrases, such as “could you please tell me more”, “how does it happen”, and “how do you feel” are needed to improve the discussion flow (see Table 3-1).

Table 3-1. Design process of interview questions

Questions from the literatures	Theory related to question	One-liner interview questions linked to research objectives	What is expected to learn from the interviews?	Probing interview questions
1) Do personal differences and nature of institution in the public sector in China affect the JS of DT users?	Technology Acceptance Model	<b>Q1.</b> Can you tell me about your working experience? → <b>RO1</b>	Demographic information of participants, contextual information of institutions	How long have you been working in this organisation? What is your work department? What do you do? How about your education background, age, working experience?
2) What are various functions of DingTalk being used in public institutions in China? And are they benefits or obstacles for work?	Theory of technology affordances; Theory of JD-R	<b>Q2.</b> How do you use <i>DingTalk</i> in the work? → <b>RO1</b>	Specified functions of <i>DingTalk</i> and its effect on different employees, and their experiences	How long have you used <i>DingTalk</i> ? How do you use it? Such as training courses, support between superior and subordinate, or special working characteristics, conditions?
3) In this study, what are the influencing factors of employees' JS during using DingTalk?	Determinants of job satisfaction; "big seven" personality; Chinese personality scale (QZPS)	<b>Q3.</b> What will impact your job satisfaction during using <i>DingTalk</i> ? → <b>RO1, RO2</b>	Identified influencing factors of JS, and something related to <i>DingTalk</i> use	How does it work? Besides personal characteristics, commitment to organisation, self-efficiency or working experiences, and education background? Is there anything else?
4) How does DingTalk technology use impact the JS and JP of employees?	Theory of socio-materiality (ANT)	<b>Q4.</b> Has your attitude and behaviours towards your job been changed after using <i>DingTalk</i> and How? → <b>RO 1</b>	Specific working attitude and behaviours towards job been changed after using <i>DingTalk</i>	How does it happen?

Questions from the literatures	Theory related to question	One-liner interview questions linked to research objectives	What is expected to learn from the interviews?	Probing interview questions
5) Will the corporate culture in public institutions improve the JS of employee during using DingTalk and how?	Determinants of job satisfaction; Theory of PSM	<b>Q5.</b> Do you think corporate culture will affect your job satisfaction during using <i>DingTalk</i> and how? → <b>RO2</b>	Cultural factors in common in public sector and their influences on JS of <i>DingTalk</i> users	What is your corporate culture? How does it transmit during using <i>DingTalk</i> ? Anything about common culture in other state-owned institutions related to <i>DingTalk</i> use?
6) Will the organisational factors in public institutions improve the JS after using DingTalk and how?	Theory of JD-R	<b>Q6.</b> Do you think organisational factor and management strategies will affect your job satisfaction during using <i>DingTalk</i> and how? → <b>RO2</b>	Some organisational factors and management strategies related to <i>DingTalk</i> use can improve JS	Whether the organisational factor and management strategies affect your job satisfaction? Is it related to the use of <i>DingTalk</i> ? And how?
7) What are the negative issues of DingTalk use affecting their JS in public institutions and how?	Theory of JD-R; Theory of technology affordances	<b>Q7.</b> Do you have any negative experience of using <i>DingTalk</i> and how? → <b>RO1</b>	Some lived experiences and perceptions about <i>DingTalk</i> use issues	And how? For instance, the confidential attribute of it, blur of work-life boundary, and other issues? Do you feel any destructive influence of the tool for your JS and your organisation?
8) Will ESM technology improve the JS of public employees? And why?	Theory of socio-materiality (ANT)	<b>Q8.</b> Do you have any management strategic suggestions to improve JS by using <i>DingTalk</i> and other ESM tool? → <b>RO4</b>	Management strategic suggestions for using <i>DingTalk</i> to improve JS	Any other ESM technique in Chinese state-owned institution and enterprises are deployed? What influence and how?

Besides, full interview questions of our study are available in Appendix 1.



### 3.2.3.2 Semi-structured Questionnaire Development

The current study followed Guetterman's (2015, p. 35) recommendation of preparing a detailed procedure for developing an instrument based on the eight steps of DeVellis (2016), and identified relevant constructs for the study.

The current study constructed the questionnaire instrument from two sources: one was relevant literature reviewed in Chapter 2 and the other was the analysed themes/variables from interviews (Chapter 4). Given the research objective is to assess the impacting extents of different determinants of JS, existing validated scales need to be adapted and changed to measure the intended variables linking to *DingTalk's* usage within specific context of China.

Therefore, based on the findings of qualitative phase, four IVs, one DV, and their indicators, the questionnaire of this phase was developed as in Table 3-2.

Additionally, the indicators or interested items of each variable were localised and appropriately adjusted to capture specific conditions and to be suitable for the context of the current study. Open questions always seek spontaneous and free responses, while closed questions are pre-coded and provide a set of alternative answers to choose between (Brace, 2018). As open questions and closed questions have advantages and disadvantages, this phenomenological study adopts a semi-structured design with both types of questions in self-administered questionnaires (Oppenheim, 1992). In this way, the survey not only facilitates more accurate assessments on the subject, but also allows more flexibility of producing richer data from open questions.

Guiding by the interview questions and qualitative constructs as variables, the whole semi-structured questionnaire had 39 questions, comprising 8 items of demographics, 29 closed questions and 2 open-ended questions at the end. The 29 closed questions were separated into five sections from 2 to 6 (see Table 3-2).

Relating the variables to the research questions, each section proposed a hypothesis for the measurement instrument of JS.

Table 3-2. Structured composition of questionnaire from interview questions

Guiding Interview Questions	Constructs / Variables	Indicators of Variable	Item	Reference to Indicators	Structured Questions
IQ1	Demographic information	/	8		Section 1: Q1-Q8
IQ2: How do you use <i>DingTalk</i> in the work?	<i>DingTalk</i> as a job characteristics resource	Theory of technology affordance, and efficiency, quality, communication, convenience, work flow	6	Adapted from Rice et al. (2017); Moore and Benbasat (1991).	Section 2: Q1-Q6
IQ3, IQ4: How do you feel <i>DingTalk</i> impacting your JS?	Individual factors through using <i>DingTalk</i>	Autonomy/self-efficacy, innovation, altruistic, generous (Chinese QZPS)	4	Adapted from Cai et al. (2018); Zhang (2019); Xanthopoulou et al. (2009b); Wang et al. (2005) and Self-developed.	Section 3: Q7-Q10
IQ5, IQ6: Do you think the corporate culture, organisational factor or management strategies can affect your JS and how?	Organisational environment for <i>DingTalk</i> usage	Public Service Motivation Supportive Leadership	3 1	Adapted from Perry and Hondeghem (2008); Kim et al. (2013). Adapted from Seipp Jr (2019) and Self-developed.	Section 4: Q11-Q14
IQ7: Do you have any destructive influence of <i>DingTalk</i> for you and your organisation and how?	Technical issues by <i>DingTalk</i> usage	Technology affordance -overload Theory of technology affordance - invasion Technology affordance -complexity and incompatibility Technology affordance -insecurity	3 2 3 3	Adapted from Ragu-Nathan et al., (2008); Yin (2016) Adapted from Ragu-Nathan et al. (2008); Yin (2016). Adapted from Ayyagari et al. (2011) and Self-developed. Self-developed from interview.	Section 5: Q15-Q17 Q18, Q19 Q20-Q22 Q23-Q25
IQ3, IQ4	General JS	Sense of achievement, cooperation, development, feeling of joy	4	Adapted from JDI, JIG	Section 6: Q26-Q29

The questionnaire began with an introduction to the research purpose for participants. Since prior research suggested that gender, age, education, job tenure, job grade, institutional type, and time length of using *DingTalk* might influence JS (Ali-Hassan et al., 2015), the first section gathered demographic information from *DingTalk* users. As different groups of people in public sector were included in this survey, the demographic information was essential to identify their categories and would be helpful for the subsequent data analysis.

Section 2 to 6 are self-administered questions, which were developed from several hypotheses of the influencing factors on different determinants of employees' JS during using *DingTalk*.

The second section "*DingTalk* as a job characteristics resource" was used to identify how public employees consider *DingTalk* as a useful tool and new social workflow in the contemporary institution and society. Therefore, the associations between measurement items of this construct/variable and JS of employees was developed as Hypothesis 1, to be tested in questionnaire.

**Hypothesis 1:** Technology affordances of *DingTalk* as a job characteristics resource have significant direct effects on JS of public employees in China.

Although there are a few studies quantitatively measuring affordances (Moore and Benbasat, 1991; Rice et al., 2017), yet the operationalisation of affordances is rare. Integrated with prior literature and interview findings, several associated affordances of *DingTalk* emerged within public contextual setting, which were labelled as usability, efficiency, quality, convenience, and workflow. Therefore, among multiple affordances, these five significant measurement items of the variable are adapted from relevant studies (see Table 3-2) to explore their correlations to the JS.

The third section "Individual factors through using *DingTalk*" is the 5-item of measurement to identify the diverse working attitudes and personal traits of employees when they are using *DingTalk* in office work, communication, learning, and training, even including working overtime. Therefore, the associations between measurement items of this construct/ variable and JS of employees was developed as Hypothesis 2, to be tested in questionnaire.

**Hypothesis 2:** Individual characteristics have significant direct effects on JS of Chinese public employees using *DingTalk*.

Based on the previous literature of Chinese personality dimensions (QZPS), the responses of interviewees would reflect their personality characteristics by evaluating the behaviours and relations (Wang et al., 2005). Especially, among “big seven factor” structure, sub-factors such as altruism, rigorous, generous, self-constrained, alert and resourceful are noteworthy indicators associated with the personal characteristics of public administrative staff in China (Wang and Cui, 2008).

Integrating with personal traits mentioned by interviewees, so, the significant items are identified as autonomy, self-efficacy, innovative, altruistic, and generous. Since the Chinese personality QZPS did not exactly match the research objectives, the scales were adapted and localised from previous literatures, such as Cai et al. (2018), Zhang (2019), Xanthopoulou et al. (2009b) and Wang et al. (2005).

The fourth section “Organisational environment for *DingTalk* usage” is developed as a 6-item scale to identify whether and how the organisational culture, such as high level of PSM and leadership, could influence employees’ JS and JP associated with using *DingTalk*. Therefore, the associations between measure items of this variable and JS of employees was developed as Hypothesis 3, to be tested in questionnaire.

**Hypothesis 3:** Organisational environmental factors related to using *DingTalk* has significant direct effects on JS of Chinese public employees.

According to Kim et al. (2013), the PSM measurement involves four dimensions, which are commitment to public interest, compassion, and self-sacrifice, and attraction to policy making. Based on relevant responses from interviews, the current study selected dimensions of commitment to public interest, compassion, and self-sacrifice as the scales for PSM, and modified the items of leadership from Zhang (2019) and Seipp Jr (2019) to answer this study’s research questions.

The fifth section “Technical issues by *DingTalk* usage” is an 11-item scale to analyse the drawbacks of using *DingTalk*, which are categorised into four aspects through interviewing responses and theoretical incidences of technostress. The four measure dimensions are highlighted as Tech-overload, Tech-invasion, Tech-complexity, and

Tech-insecurity (Ayyagari et al., 2011). Therefore, the associations between the four measurement items of this construct/ variable and JS of employees was developed as Hypothesis 4, to be tested in the questionnaire.

**Hypothesis 4:** Various technical issues of *DingTalk* usage have significant direct effects on JS of public employees in China.

Tech-overload refers to the perceived negative emotions of employees when they are required to work faster and longer beyond their capability to cope. Tech-invasion refers to situations in which employees are assumed to be available and responsive at any time via *DingTalk*, which leads to employees' becoming concerned about the blurred boundary between their personal life and work-related context. The measurement of these two indicators were adapted from both the studies of Ragu-Nathan et al. (2008) and Yin (2016a). The third dimension "Tech-complexity and incompatibility" was measured by integrated adaption of Ayyagari et al. (2011) and items developed by the researcher. The third dimension was anticipated to investigate how public employees perceived the functional complexity and incompatibility of *DingTalk* use in their work. Tech-insecurity refers to concerns about the technique risks associated with using *DingTalk*, such as data leakage, security threat, and invasion of privacy. Its measurement was developed by the researcher from interview results.

The sixth section "general JS of employees" is a 5-item scale to measure the overall JS of the employees using *DingTalk*. Since the measurement scale is used to estimate a general overall feeling of the respondents towards their current jobs, it was adapted from five subdimensions of the JDI (Kinicki et al., 2002) and JIG (Ironson et al., 1989). The scale primarily includes: a self-reported sense of achievement, interpersonal relationship with leaders, co-workers, future promotion, and overall gratification to the JS directly. It reveals a self-reported psychological mood and rational motives after socio-technical interactions within organisations (Mullins and Christy, 2016).

Because the data retrieved from a questionnaire is usually argued to produce answers to scope, rather than depth, so this study utilised two open-ended questions

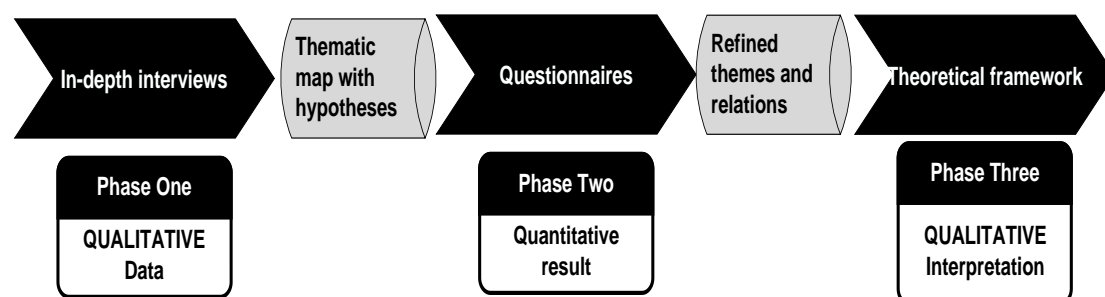
in questionnaire to gather more information. Thus, the final section ends with two open-ended questions to further explore employees' thoughts, attitudes, and lived experiences. One question is "What improvement (including design and use) do you think should be made for *DingTalk* to increase your job satisfaction?" and the other is "Do you have any other suggestions for using ESM tool during work?" The answers to open-ended questions were coded into categories and enhanced the results from identified themes of JS.

The well-known Likert scale of quantitative measurement (published by psychologist Rensis Likert in 1932), also known as an "agree- disagree" scale, was used in this survey (Brace, 2018). Hence, 5 Likert-scale with scores rank from "1"- strongly disagree, "2" - disagree, "3" - neutral, "4"- agree, to "5"- strongly agree, which represented different degrees of attitudinal dimensions for participants. Similar attitudes in the form of quantitative data can be calculated as the DV of JS, while the diverse attitudes and OB outcomes also produce relevant results in qualitative analysis for self-completed questionnaires.

### 3.3 Data Collection Methods

The whole exploratory mixed research contains two sequential data collection approaches shown in Figure 3-3.

Figure 3-3. Data collection of sequential mixed methods



On the first stage, the qualitative data collection included two parts. Firstly, based on knowledge of *DingTalk* users' JS from literature reviews, some relevant concepts were identified. Then, in-depth interviews can offer a broad exploration of employees' attitudes to *DingTalk* use and enrich understanding of the Chinese social context.

The significant themes were mapped out from analysis of qualitative descriptions,

and then analytic themes associated with relational hypotheses to JS of *DingTalk* users were further examined by quantitative strategy.

On the second stage, the semi-structured questionnaire developed instrument and collected data to answering the research questions of “what” and “to what extent”. Thus, the quantitative methods embellished the previous findings of qualitative research with a numerical significance and logic-based conclusions (Creswell et al., 2003; Creswell and Poth, 2018). In this way, the researcher could interpret the primary themes of JS and their correlations through statistical results from questionnaire answers.

On the final stage, the researcher made complete inferences from both the qualitative and quantitative databases (Creswell and Creswell, 2018). The deeper understanding for *DingTalk* phenomenon was refined by complementary support from both interview findings and questionnaire result. Systematic analysis and insights into the effects of *DingTalk* can built a composite theoretical framework for employees in the public and state institutions in China.

Sections 3.3.1 and 3.3.2 respectively introduce the whole process of two data collection strategies in turn.

### **3.3.1 In-depth Semi-structured Interview**

Holstein and Gubrium (2003) proposed that an interview is “a site of, and occasion for, producing knowledge itself” (p. 4). Interviews can be used for different purposes; two essential types are exploratory interviews and standardised interviews. Since the purpose of interviewing in the current study is heuristic and exploratory, to develop ideas of how people think and feel about the research topics, rather than gather facts and statistics in standardised interviews (Oppenheim, 1992). An in-depth interview should be a collaboration between researcher and participants that explores the *DingTalk* phenomenon from shared concerns. The researcher’s narrative and how the respondents experienced, jointly construct the conceptualization of research problems (Gubrium and Holstein, 2001; Agarwal and Sandiford, 2021). Accordingly,

in-depth, phenomenological interview requires the researcher to identify the real meanings of participants' attitudes and experiences in the specific context of China and address the first research question, based on the understanding from previous literatures. The researcher needs to reflect on the essentials and theories behind different responses of interviewees.

Nowadays, besides the traditional way of face-to-face interviewing, various other methods are used to conduct interviews, such as telephone or Internet interviewing, which provide convenient access to anywhere and at any time. Contemporary technology enables more flexibility in contacting participants in different locations of one organisation and it reduces costs of time and distance compared to traditional ways. In the current study, several state-owned institutions have many branches or departments located in different cities in China, and even the informants are remote in different workplaces of one target group. It was impossible to conduct face-to-face interviews with selected participants from all around the country; therefore, audio interview by Internet and mobile phone was adopted as the primary way of interviewing in current study.

### **3.3.1.1 Pilot Study of Interview**

Before formal interviewing, a pilot study is particularly useful for trying out questions and procedures to find out if they are effective at achieving research aims (Oppenheim, 1992). A pilot study is a small-scaled implementation of a research or feasibility study of the whole research (Given, 2008). For instance, a pilot interview can assist in testing the following questions: How long time might the whole interview take? Does the sequence and content of questions need to be improved? How to deal with the poor responses of similar informants to some sensitive questions? Whether the interview questions in this study were unclear/ unrelated? What items and variables are missed from the results? and so on.

Therefore, the researcher tried out interviewing with two participants in different public institutions to check the interview questions in this study. According to their responses, some revisions were made to the enquiries, because some wordings of



questions were too academic and ambiguous for the audiences. Thus, one interview question was removed from the original design, and a novel version of eight open-ended questions was formed as in previous Table 3-1.

The questioning techniques of interviewing are of special importance, such as a comforting environment and encouraging smile in face-to-face interviewees. For audio interviews, building rapport and trust is the first step, then being a better listener than a speaker, allowing any participants to answer in their own words and express diverse attitudes. In addition to suggestions about interview questions, the supervisors reminded the researcher that, they needed to use more open-ended and probing questions during the process of interviewing.

A pilot test in advance seems costly but it can encourage methodological rigour, validity, and lead to good qualification of results and objectives in the current study (Lancaster et al., 2004). After completing a pilot study, researchers can step back, reflect on their bias, discuss with their peers, and revise their research approaches based on what they have learnt from their pilot experience (Maxwell, 2013).

### **3.3.1.2 Sampling Method for Interview**

In a primarily qualitative research, researchers want to dig deeply and select richly-textured information relevant to the phenomenon, thus purposive techniques are often adopted as the most widely choice (Vasileiou et al., 2018). Purposeful sampling (i.e., purposive sampling) is not exclusive of other sampling strategies, it refers to intentionally selecting a target population of interest who have experienced the phenomenon and understand the concepts (Creswell and Clark, 2018).

The current study aims to find the right participants with the same experience of *DingTalk* phenomenon. In each civil occupational category, selected participants should be representative of a population to deliver relevant perceptions about JS. Therefore, in each group of interest, the selection might be a combination of a stratified or snowballed sample with a purposeful sample, although the sample size is relatively small (Patton, 2015, p463).

This study began with a variety of groups of public institutions; it ensured sample diversity of *DingTalk* as a SM tool because *DingTalk* was deployed in at least one department within the target institutions. Since numerous public employees in diverse departments are actively involved in *DingTalk* and have lived experiences closely linked to the topic of this study, it was necessary to start with certain key informants in one group firstly, then other groups or departments. Then a purposeful sampling technique was designed to gain maximum variation of employees. In this way, valuable information, such as in-depth understanding of individuals and specific attributes of public agencies, is presented related to the research questions under examination (Patton, 2015; Tashakkori and Teddlie, 2008). As the interviewing proceeded, the researcher would use multiple sampling strategies within a subgroup. The opinions of different participants would reflect diversity and construct a complex figure of the phenomenon (Creswell and Clark, 2018). Thus, this is the reason why the current study chose purposeful sampling.

Among millions of corporate customer cases on the *DingTalk* official website, six types of public institutions in China were chosen as China Media Group, state bank, public hospital, China FAW Group, Tax bureau and China Telecom. These six types of organisations are considered prominent and representative of the three categories of organisation (MBA Think Tank Encyclopedia, 2022) in the public sector. For example, the Tax bureau is selected as a state administrative body, whereas China Media Group, state bank, and public hospital are all public institutions authorised by state power and they mainly provide social services. China FAW Group and China Telecom are state-owned enterprises, funded by the government, and operated in an enterprise-style.

The interview participants are expected to understand the research problem and the *DingTalk* phenomenon. At the organisational level, the selection criteria of differentiation and convenience were taken into consideration, which involved both purposive sampling and snowball sampling (Creswell and Poth, 2018). Table 3-3 shows the information of interview respondents in six types of Chinese state-owned enterprises and public institutions through mixing purposeful sampling.

Table 3-3. Participants in six chosen public institutions

#	Public Institutions	Participants	Job Grade
1	Media group	5 persons	1 senior manager, 2 newspaper editor, 1 TV editor, 1 journalist
2	State bank	3 persons	1 technical leader, 1 senior director, 1 clerk
3	Public hospital	3 persons	1 technical manager, 1 technician, 1 administrator
4	China FAW group	4 persons	2 R&D engineers, 1 project manager, 1 project administrator
5	Tax bureau	6 persons	2 civil servants, 3 section chiefs, 1 director
6	China Telecom	4 persons	1 chief technology officer, 1 technical leader, 2 technical staffs

During the interviewing process, in each subgroup, three are three choosing criteria. The first one is ensuring employees' authentic working experiences of *DingTalk*, the second one is trying to cover diverse job positions or different ranks of employees from clerk, civil servant, administrator, technician, junior manager, senior manager, to chief director in each institution, and the last one is gender and age. And then other employees were found within the same group by mixed snowball and purposive sampling.

In a sense, participants have a certain degree of participant homogeneity or similarities in this study, because they all work for state institutions and serve the public. It is quite understandable that a senior manager in China Media Group and a director in Tax bureau have relatively common perceptions and experiences within each group or even among various groups.

Some studies argued that no description of saturation can be determined in advance, and there are no practical guidelines for estimating sample sizes for purposively sampled interviews; however, quality should be the essential determinant of sample number rather than quantity (Oppenheim, 1992; Patton, 2015). Nevertheless, Guest et al. (2006) recommended 12 interviews for assessing variation between distinct groups or correlation among variables. The numbers of participants recommended by scholars are very different, for instance, 6 to 12 for phenomenological studies by Morse (1994), the smallest acceptable number of 15 qualitative interviewees by Bertaux (1981), 5 to 25 interviewees by Polkinghorne (1989) and Creswell (2013). And there are various 40 types of purposive sampling by Patton (2015). Whereas, Guest et al. (2006) recommended that the size of purposive samples be established

inductively relevant to research objectives until theoretical saturation. The point of saturation refers to the point at which an investigator finds no more new information or theoretical inspiration to add to the existing database from new respondents (Glaser and Strauss, 2017).

Although a diverse sample of participants can represent a broad range of occupations and localities in public agencies in the current study, the researcher had no idea of the best sample size before undertaking data collection. The researcher made the decision of “saturation” depending on subjective judgement of gathered information during the process, and ceased additional interviews when no new information was gathered from respondents. This study reached an approximate saturation point at 25th interview and detailed information about participants is shown in Appendix 2.

### **3.3.1.3 Process of Formal Interviews**

Semi-structured in-depth interviews were used firstly to explore the attitudes and perceptions of public employees about the research problems from the literatures. Each interview lasted for around 20 to 40 minutes and the whole interviewing series was conducted from July to October in 2021. The interview information of participants, such as gender, working experiences, and interviewing processes are listed in Table 3-4 below.

Table 3-4. Profile information of interviewing participants

#	Interviewee	Gender	Working Experiences	Interview Format	Duration (min.)
1	Senior manager of technology department of media group	M	18 years	Face to face	25 mins
2	Newspaper senior editor of media group	F	17 years	Phone	15 mins
3	Newspaper editor of media group	F	14 years	Phone	20 mins
4	TV editor of media group	F	6 years	Phone	19 mins
5	Journalist of new media of media group	F	16 years	Phone	15 mins
6	Senior manager of technology department of state bank	M	15 years	Video	28 mins
7	Senior director of technology site of state bank	M	15 years	Phone	32 mins
8	Clerk of state bank	F	19 years	Phone	18 mins
9	Director of technology department of public hospital	M	18 years	Video	32 mins
10	Technician of public hospital	F	15 years	Phone	20 mins
11	Administrator of public hospital	M	8 years	Phone	13 mins
12	R&D senior engineer of China FAW group	M	18 years	Phone	27 mins
13	R&D junior engineer of China FAW group	M	6 years	Phone	17 mins
14	Project manager of China FAW group	M	13 years	Phone	23 mins
15	Project administrator of China FAW group	M	6 years	Phone	21 mins
16	Civil servant of tax bureau	F	22 years	Phone	14 mins
17	Civil servant of tax bureau	F	5 years	Phone	18 mins
18	Section chief of tax bureau	M	14 years	Phone	20 mins
19	Deputy section chief of tax bureau	F	21 years	Video	26 mins
20	Section chief of tax bureau	F	16 years	Face to face	33 mins
21	Director of a division of tax bureau	M	22 years	Phone	15 mins
22	Chief technology officer of China Telecom operator	M	18 years	Video	28 mins
23	Technical leader of department of China Telecom operator	M	15 years	Face to face	42 mins
24	Technical staff of China Telecom operator	M	7 years	Phone	19 mins
25	Technical staff of China Telecom operator	F	24 years	Phone	20 mins

Among 25 formal interviews, only three were arranged as face-to-face conversations, the others were conducted through Internet video calls and mobile phone calls. As shown in the Table 3-4, there were 11 female and 14 male participants in public sector because the researcher expected to meet three choosing criteria as mentioned.

Before interviewing, it is essential to obtain informed consent from participants in advance (see Appendix 3). During the discourse, because of their social identities,

participants could respond freely to an enquiry or not offer a response to every question (Geer, 1988).

The interview duration was not very long because most interviews were through mobile phone calls during the pandemic year and we had limited interactions before formal interviewing.

However, as an interviewer, the researcher made every effort to sustain good rapport and engage respondents, and to trust themselves to express ideas spontaneously. In addition, a researcher should show authentic concern for the welfare and dignity of participants and develop responsible relationships. A researcher should not simply offer dichotomous choices to interviewees, instead, some supplementary questions are proposed to probe their experiences, feelings, and appraisals around the research topic (Young et al., 2021). The interaction between researcher/interviewer and participants is a delicate balance because the interviewer has to provide enough flexibility and openness to the participants, and maintain a focus on research problems by following a script (Seidman, 2013). Moreover, the interviewer needs to avoid any behaviour that would impose my opinion into the perceptions of interviewees such as “*DingTalk* is job demand” or “*DingTalk* is job resource”.

Afterwards, the researcher needs to keep myself bracketing into the final process of analysis and construct the explanations from their answers, whether it is consistent with their identities and context of dialogue.

During the process, the researcher must decide how information should be recorded and how significant notes are to be taken efficiently in the conversation. Even responses that are irrelevant to the topic should be recorded; as well as the similar repetitive answers. Interviews were conducted until data or information saturation.

After interviewing, tape records of conversations were translated and transcribed by professional software *Xunfei*. Afterwards, the researcher checked and reviewed the related data for translation accuracy, and then fed back the transcripts to interviewees through extensive notes. Then NVivo software was used to identify key variables and themes across the files of participants, rather than examine frequency of codes. In the next follow-up quantitative phase, construction of a questionnaire

instrument based on qualitative variables would help develop a richer picture of various influencing factors of JS in Chinese context.

To sum up, integration of the research questions from the literature and interview findings in the qualitative phase could gather broad experiences and interpretations of employees in Chinese public context to understand the *DingTalk* phenomenon.

#### **3.3.1.4 Research Assessment**

For qualitative and quantitative research, the key criteria for ensuring research rigour differ and correspond with disparate strategies and perspectives. In this section, the research assessment of the qualitative phase is discussed first.

##### **Validity**

Validity is the degree to which a measure reflects the object as both correct and accurate as possible (Hair et al., 2019). Validity refers to the idea that a measure can truly reflect what actually happened, or that it is accurate to describe the scale scores of variations under a specific phenomenon (Flick, 2007). Thus, validity in qualitative research focuses on credible inferences from data rather than the data itself (Creswell and Miller, 2000). For the qualitative research in this thesis, accurately interpreting the participants' perspectives and attitudes to represent social phenomena is the leading principle.

An instrument can be valid in one context but invalid in another condition, thus, the content validity should be highly context dependent. In other words, the researcher needs to make an important decision on how broadly or narrowly to measure the constructs and variables regarding the concepts of interest, specific population, and investigated domain (DeVellis, 2016). Whether the participant was telling the truth and being candid, or researcher misunderstood participants' interpretations were the researcher's concerns in the process of conducting interviewing. Therefore, the criteria of qualitative research are very important.

Social scientists debated whether the reliability and validity used in natural science would be inappropriate for qualitative investigations or as criteria to assess qualitative research (Bryman, 2012). However, this does not mean that a qualitative account is

not valid or credible, or that validity is limited to quantitative measurement. Various perspectives of validity have been suggested in qualitative literature, and there has been evolving understanding about validation, parallel to quantitative equivalents (Creswell and Poth, 2018). For instance, some qualitative researchers talked in similar terms about the “trustworthiness” (Glaser and Strauss, 2017) or the “consistency” of information (Hammersley and Atkinson, 1995). LeCompte and Goetz (1982) identified that the merits of the research method and good quality of interpretation are mostly taken as criteria for internal validity. Further, external validity is a means of verifying generalising representation so that the outcomes of the research can be “transferred” or “applied” to other situations or fields.

In addition, Lincoln and Guba (1985) argued that the quantitative notion of validity should be substituted for another set of criteria, such as credibility, transferability, dependability, and confirmability, for research trustworthiness; these criteria are still popular in qualitative research.

What this research did to enhance the credibility of in-depth interview was prolonged engagement, progressive subjectivity, and member checking through evaluating all transcripts of the participants. Rich descriptions of the Chinese context and research objects were needed to help readers understand the dynamic feelings, interactions, and attitudes in the account to establish credibility.

As for transferability, since the number of interviews was relatively limited, it is hard to achieve quantitative generalisation. The way to achieve transferability in this study is to present the plentiful components of the *DingTalk* phenomenon, a thick description of participants’ characteristics and the timeframe of data collection in a specific context. Such factors can offer material that is useful and meaningful, which helps readers to understand the findings in a similar condition or be relevant to broader contexts.

In addition, in relation to dependability, there was always a concern whether informants would change their thoughts and expressions at a different time. The way to increase dependability is to ensure that proper research practices have been undertaken and other researchers could repeat the study design. For instance, a



researcher should select the right participants, note every alteration, such as contextual or opinion changes during the interviewing process, and use a proper method of data analysis. In a final report, a researcher should be the one who “interprets the detailed interpretation of others” (Grix, 2004, p. 54) and makes meanings of their concrete experiences and behaviours in Chinese context. Confirmability indicates that a researcher should truthfully reflect the participants’ ideas and their own interpretations in their records, which can be demonstrated through feeding back to participants. For example, before the findings are reported and cited, interviewees have the right to apply their own interpretive words to the researcher’s text, or ask for amendment of documents. The current study provided the feedback to the interviewees and welcome any their checks in records. Moreover, peer review or a supervisor checking, both the methodology procedure and report can minimise the influence of the researcher on the result to achieve better rigor and quality (Johnson et al., 2020). Thus, the schedule of peer review was adopted in the current study.

Likewise, Maxwell (1992, 2013) provided five types of validity in qualitative research, which are descriptive validity, interpretive validity, theoretical validity, evaluative validity, and internal generalisability. For instance, descriptive validity requires that a researcher accurately presents the interview transcript without any omission in the account or that they support their claims with statistically descriptive aspects of accounts. Interpretive validity emphasises the perspectives of the participants in the situation, including their intentions, beliefs, and values. Theoretical validity goes beyond the previous two types and addresses the conceptual and theoretical constructions, such as the essence of the *DingTalk* phenomenon, during the study. However, a theoretical contribution of a study may produce different outcomes in different situations and with different selected participants. Internal generalisability refers to the generalisability of a conclusion within the underlying setting, which is important to qualitative research (Maxwell, 2013). Thus, the sampling method is relevant to qualitative researchers to capture the variations in the current phenomenon.

Therefore, how to evaluate qualitative research is not an easy feat and the above principles are not the only criteria. Many scholars are constantly working on the improvement of evaluation criteria for qualitative research, for instance, Philipps and Mrowczynski (2021) introduced the documentary method of interpretation (DMI) to reconstruct implicit knowledge in the process of content generation in the interview setting and improve validity.

### **Reliability**

Likewise, reliability is a fundamental requirement in psychological measurement. If validity is ensured, the researcher should still consider the reliability of a measurement (Hair et al., 2019). It refers to the degree that observed variables represent the “true” values and be almost “measurement error free”. In practice, reliability implies that a reliable scale should reflect the true score and nothing else related to external factors (DeVellis, 2016). Essentially, it is requisite for a qualitative inquirer to demonstrate quality control problems for the research.

Reliability in qualitative research means that researchers can check the consistency of results through some credible procedures over time (Gibbs, 2018). For instance, one can check that member checking, peer reviews, triangulation, external audits, and thick description are appropriately deployed in one or more procedures to validate the investigation (Creswell and Miller, 2000).

In the phase of designing interview questions in this thesis, in order to ensure the fit-for-purpose aims, a checking form was developed and supervisors’ consultation was requested. Furthermore, peer reviews for accurate language translation are assisted by two English teachers. Moreover, the pilot study of interviewing helped the researcher discuss interview questions with peers, reflect on bias, and refine the research questions and strategies to encourage rigour of the research method. At the beginning of interviews, informed consent from all participants were obtained in advance. At the data analysis, the codes were checked by comparing one interpretation with others in similar settings to ensure the consistency and accuracy of interpretations. After the interpretation of each interview, sending the respondents transcripts could ensure their answers effective and feeling comfortable about the

content. Accordingly, reliability crucially depends on the skills of the researcher and how schemes were completed during the study (Robson and McCartan, 2016). Thus, according to Yin (2016), a researcher should record one's conducting steps in detail to ensure no obvious mistakes in transcribed text. Finally, assuring reliability of the research may help different researchers obtain significant findings, through constant comparisons of procedures, across different settings and variations within which the *DingTalk* phenomenon could be repeated in another situation.

### **Generalisation**

Generalisability means that the results of research and analysis can be applied to a wider group of people, social situations, and environmental settings. Internal generalisability is considered more important than external generalisability for qualitative research, since selective sampling could bring in bias (Maxwell, 1992, 2013). However, the content of the current study has no absolutely valid scale, an unmeasurable context, and is hard to repeat in terms of traditional concepts for a social science. Following Parker's (2012) stance, qualitative research generally operates in completely different domains with different missions and agendas. A replication of an original study should be conducted as closely as possible to the original to reproduce similar findings, which would help confirm the reliability of the inquiry. Furthermore, real-world situations in social research depend on a clear and specific setting of the group studied, representative occupations and accurate explanations of the findings.

In some ways, the singularity and uniqueness of one *DingTalk* phenomenon is difficult to repeat in a private institutional setting or other country context; however, this inquiry focus on recognising the essentials of the *DingTalk* phenomenon in an existential generalization sense (Van Manen, 2016). For instance, when identifying variables from interviews, the generalisability of a conclusion can only be extended in similar public settings and with relatively homogeneous groups. Additionally, this does not preclude help in understanding the theoretical generalisation of JS in China in other cases or situations. This study considers *DingTalk* application to be an example, but there are other similar mainstream software, such as Enterprise

WeChat, Feishu, Huawei Cloud WeLink, that have similar positive and negative influences on individuals and institutions in the digital industry.

Therefore, although Van Manen (2016) did not approve of empirical generalisations from phenomenological studies, this research may help arrive at some type of universal or generalised insight into ESM phenomenon through similar discussion, holistic profiles, narrative model, and reflections of experiential data resources in relation to *DingTalk*.

### **3.3.2 Semi-structured Questionnaire**

The second phase of data collection in this study relied on information derived from the first phase, and turned the research objectives into a set of requirements, then into a questionnaire (Brace, 2018). After identifying analytic themes as research variables and significant indicators of each variable, the findings can guide the development of questionnaires and scales. For instance, the primary four themes from qualitative finding are transformed into four IVs, and the overall JS of employees becomes the DV in the questionnaire. Each variable or construct is measured primarily in terms of several closed-ended questions and categorised by demographic samples. Some measurements of indicators are developed from interview findings, and some can be calculated from previous research or well-validated scales in the literature (Oktosatrio, 2019).

#### **3.3.2.1 Pilot Study of Questionnaire**

Since the results of the data analysis will not be correct and valid if the instrument is not valid (Sekaran and Bougie, 2019), the scales of all constructs in this study were adapted from well-established scales from previous literature and some have been widely used in OB research.

Furthermore, based on a draft version of a questionnaire, expert views or consultation with experts about the design, and a pilot programme, are indispensable before conducting a survey. A pilot procedure not only helps establish the content

validity of the questions, format, and instructions, but also identifies the duration and participant fatigue (Creswell and Creswell, 2018).

Firstly, the initial questionnaires were sent to supervisors to ask for suggestions. Originally, there were 38 closed-ended questions and no open-ended questions in this design. One supervisor suggested changing some of the closed-ended questions to open-ended ones because of my philosophical paradigm. Responses to open questions are more likely to meet the objectives of the research through revealing subjective experiences and attitude statements than rating scales. Accordingly, one closed-ended question was modified as pre-coded responses with a list of choices identified from interviews and literatures. Only two open-ended questions were added because of concerns about the poor response rate to open-ended items. The other supervisor suggested I prepare an information sheet and informed consent document to give to respondents before the survey; additionally, she reminded me that some important options such as "I don't know" and "the others" should be added to the choices for participants.

Secondly, two human resources experts were consulted on the description of the questionnaire items to ensure validity of the content. After expert consultation, a human resources professor suggested that wording in the questionnaire should use everyday vocabulary instead of long and complex sentences, as it would be easier for respondents to understand. In some cases, if participants do not understand the meaning of a sentence because of obscure and academic words, they probably choose the middle item "neutral". Furtherly, another expert gave suggestions on the sequence of questions in this survey. For instance, specific and detailed questions should be positioned before general questions, and attitudinal questions should be asked after specific behavioural questions. In addition, before advancing a considered answer to the key questions on general JS, both two sides of the argument about *DingTalk* usage should be fairly stated in the previous questions. Thirdly, Since the questionnaire was developed in English, but the final Chinese questionnaire was distributed to participants in China, this study made some localised adjustments to the scales. So, two English teachers were invited to assist in

the translation to ensure equivalence of the measures in the Chinese version. Besides, the English version of the questionnaire items was ensured to have equivalent meanings to the Chinese description (backward and forward translation). After explanations and discussions with the researcher, ambiguous questions were revised into short and clear sentences. Thorough revision of both question content and procedures, backward and forward translation, and double-checking of the question wording were done to ensure validity of the survey instrument (Patton, 2015; Krosnick, 2018).

Finally, this study invited 15 public employees in China with attributes similar to the “target respondents” to participate in the pilot test. They were chosen from the target groups. The participants of the pilot test of the questionnaire made some suggestions regarding the readability of the items, the numbered sequence of the questions, paragraph description, and the necessity of open questions. In response to the feedback, the numbered sequence of items was adjusted, and phrases and words were modified to improve the clarity for different sections and open questions. The next two sections consist of the sampling method for the questionnaire and quantitative data validation with adequate validity and reliability. The online distribution process of electronic questionnaires enables participants to complete the survey at their convenience, even when geographically dispersed, and the anonymity of the survey is ensured.

### **3.3.2.2 Sampling Method for Questionnaire**

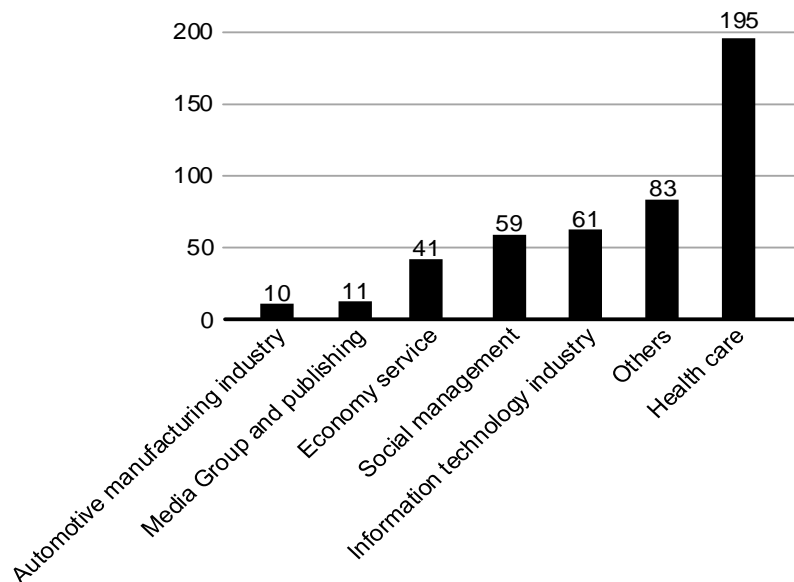
In the case of non-probability sampling, there is no absolute “correct” number of participants for questionnaires, since participants are chosen by the researcher based on the characteristics of the target population (Fink, 2003). Snowball sampling is considered useful and is a commonly used method of non-probability sampling to access information-rich participants firstly, and then it is gradually extended to other purposive samples in the research (Patton, 2015). It is an effective and efficient way to generate an online survey sample. Thus, current study distributed an online survey

through snowball sampling to *DingTalk* users in various public institutions in China as many as possible.

Most of the time, statistical calculation is an appropriate way to decide the right sample size for questionnaires (Haque, 2020). Dupont and Plummer (1990) described their program for calculating power and sample size to detect specified alternative hypotheses. Test statistics of the study are used to ensure the validity and reliability of the questionnaire (Dupont and Plummer, 1990).

In addition, since the current study is designed as exploratory sequential mixed methods, the samples in the qualitative phase should not be repeated in the quantitative phase because of undue duplicated responses. The sample of participants provided evidence for scales, instrument, and construct design, to ensure the validity of instrument, should not be included in the follow-up questionnaire in the second phase (Creswell and Creswell, 2018). Thus, access to a large sample in both six chosen institutions previously and other available public organisations are vital to represent the whole target population of public employees, to construct an accurate, reliable, and valid survey for the study. Thus, a sample of 460 respondents was found in the survey, and different sampled size for various public institutions is shown in Figure 3-4.

Figure 3-4. The sampled number of *DingTalk* users in various public institutions



Among them, the largest group of 195 respondents are collected from the public hospitals of health care. And 41, 59 and 61 persons are respectively from different groups of state institutions: state banks, tax bureau, and China telecom. Then 10 and 11 participants are found in China FAW Group (e.g., automotive manufacturing industry), China Media Group and publishing; the remaining respondents are from other public organisations.

### **3.3.2.3 Process of Formal Questionnaire**

At the beginning of recruitment, through searching relevant cases in state-owned enterprises and institutions on the official website of *DingTalk*, the researcher found some significant institutions in China. Afterwards, six representative establishments are respectively chosen from three categories of organisation in the public sector. Furthermore, through building weak social ties with some boundary spanners in those organisations, and continually keeping touch with the preceding interviewees, the researcher gained access to more and more colleagues and acquaintances for the survey. The whole duration of the survey lasted nearly a month: from 19th May to 13th June.

However, there are also challenges in online surveys, such as coverage and non-response of participants. Although online questionnaires are convenient, as researchers can mail or distribute them to participants without constraints of distance and time; however, the response rate is often unsatisfactory due to people's fatigue with Internet surveys (Lessof and Sturgis, 2018). To promote more responses of *DingTalk* users, the researcher sent a link to maximise publicity, kept the survey link visible, provided lottery incentives to respondents, and tried not to increase respondents' burden during the process. After one month of distribution, 460 valid questionnaires were collected from the online survey in this study.

After constructing the questionnaire, the quantitative data collected from the survey are used to illustrate the relationships between IVs and DV in this *DingTalk* research, and the result could confirm our four hypotheses in the next chapter.



### **3.3.2.4 Research Assessment**

The quantitative tradition believes that reliability and validity are important criteria for measuring objective scales, and quantitative researchers rely heavily on them to ensure the replicability and measurability of their research (Auerbach and Silverstein, 2003). The concept of generalisability refers to the repeatability of a study to other contexts; consistent measurement could facilitate the external validity of results in quantitative research. In the traditional area of quantitative research, the studies of investigators applying the positivist paradigm should be universally replicable in new situations or in a larger population with minimum subjectivity and bias (Vogt et al., 2014).

#### **Reliability**

Reliability means that the instrument of a questionnaire should be reliable and the constructs should be designed to measure consistently (Field, 2013). Thus, the reliability test of a questionnaire is to ensure that the responses are a true reflection of the intended objectives, and that collected data is of value. Sometimes the linkage between items and the latent variables cannot be directly inferred; however, high inter-item correlations between each other should imply the same thing (DeVellis, 2016). Internal consistency is considered the most commonly used indicator of intrinsic reliability, which refers to the homogeneity of the items within a scale and the consistency of the structure. Internal consistency is typically examined through computing Cronbach's coefficient alpha ( $\alpha$ ) and the covariance matrix of scale items. SPSSAU (Statistical Product and Service Software Automatically) was used as the statistical tool to test the Cronbach's alpha of the scales to ensure instrument reliability (Trochim and Donnelly, 2006). The criteria for the Cronbach's alpha of quantitative results in attitudinal constructs are: Excellent ( $\alpha > 0.9$ ), Good ( $0.7 < \alpha < 0.9$ ), Acceptable ( $0.6 < \alpha < 0.7$ ), Poor ( $0.5 < \alpha < 0.6$ ), Unacceptable ( $\alpha < 0.5$ ) (Kline, 1999; George and Mallery, 2003).

#### **Validity**

Validity refers to whether an instrument can accurately measure the content to be examined (Hair et al., 2019). Assessing the validity of person's attitudes or perceptions is often a necessary but relative measure. There are various types of validity, such as content validity, construct-related validity, convergent validity, and discriminant validity.

Table 3-5. Description of various validity (source, SPSSAU, 2023)

Type	Overview	Means of verification
Content Validity	Describe the validity of the scale in words, such as with reference sources and the scale approved by experts.	Text description
Construct-Related Validity	Whether the corresponding relationship between factors and measurement items (scale items) conforms to expectations; if it works as expected, it indicates the scale has structural validity.	Confirmatory Factor Analysis (CFA) and Exploratory Factor Analysis (EFA)
Convergent Validity	Emphasise the fact that measurement items are indeed categorised into the same factor	AVE and CR indicators of CFA
Discriminant Validity	Emphasise the fact that the different measurement items are not categorised into the same factor	Comparison of AVE and correlation analysis results

For the self-report questionnaires in the current study, content validity refers to the degree to which different question items can represent the measuring construct and cover the overall concept definition. Thus, through previous literature reviews, expert consultation and questionnaire pilot, the objective of content validity is to ensure the construct definition, selection of scale items, and theoretical correspondences for their design in the survey.

Construct-related validity refers to the extent to which the measured variables represent a set of theoretical latent constructs. Since the questionnaire is self-developed, its construct-related validity needs to be examined through the statistical techniques of Confirmatory Factor Analysis (CFA) and Exploratory Factor Analysis (EFA). For the current study, EFA is considered the first step to determine the underlying construct for several variables, and CFA is the next step to confirm the most appropriate factor structure (Haque, 2020). Afterwards, the index such as AVE,

CR, and correlation analysis can be indicators of convergent validity and discriminant validity, which ensure that measurement items are categorised into the same factor.

### **3.4 Researcher's Role and Reflexivity**

From the perspective of qualitative research, the central role of the researcher in the research process, is an instrument, and the researcher's subjectivity and values are a necessary part of phenomenological enquiry, which should not be eliminated from the study (Auerbach and Silverstein, 2003). Thus, interviewers belong to one part of the interviewing picture, since they interact with the participant, and work with the material, analyse it, and interpret it (Seidman, 2013). For example, when thoughts, aspirations, feelings, even ethnicity, class, gender, occupation, family background, schooling and experiences are brought into research, the investigator needs to be aware of their personal epistemology influencing on the phenomenological research (Sundler et al., 2019). With hermeneutic phenomenology, the researcher's opinions are important as the informant. Researchers need to adopt an approach of openness, and a reflective attitude as methodological principles to perceive, question and understand how participants interact, then to interpret their experiences regarding the actual context (*ibid.*).

Therefore, an open mind and self-awareness of the researcher should be applied throughout the whole process, which involves developing research questions, selecting the methodology, collecting data, analysing data, constructing conceptual framework, and reporting conclusions. In any research paradigm, minimising the risk of bias and maximising the accuracy and credibility of the research findings are of critical significance for the researcher from design to dissemination (Johnson et al., 2020).

For the current study, the education background of the researcher includes many years' learning of communication engineering and automation engineering. This led to a great interest in new scientific and technological changes in society and industry, especially the interactive relationships between humans and disruptive technologies. As a teacher of higher education in China, with 12 years' experiences

in teaching and 6 years' experiences in administrative work, the researcher also cares about how people feel at work and how they perceive the technical changes of office-related software. The prevalence of *DingTalk* in public sector in China and the attitudinal and behavioural changes of users who experienced the *DingTalk* phenomenon attract great attention of the researcher.

The learning and work experiences of the researcher can determine the samples and available resources in the study. For instance, the investigator can get permission to interview several staff and managers of state-owned institutions, because some friends are working in branches of these public organisations. Some of the interviewees from an information department are accessible because their similar education background as that of researcher's. Some public employees showed their sensitive attitudes to the research approval letter and were suspicious regarding the confidentiality of interviews and rejected the research. Thus, the researcher tried to seek alternative candidates from different working positions in three categories of public institutions. Whereas, there were also many unexpected situations; for instance, a pre-agreed participant cancelled the conversation abruptly, and a department denied access to the online survey. To make up for it, the researcher needs to provide an extra plan, more appropriate sampling choices, and flexible changes according to the moment.

Furthermore, there are no standardised guidelines for sampling saturation and good interviewing results, since everyone might have a bias to express or conceal their authentic opinions during discourse interactions based on their social identities. Especially for employees in certain state-owned institutions, confidentiality and cautiousness are their working principles; the responses of participants should be respected and trusted without sceptical judgment. The researcher has already made great effort to create a comfortable environment, established a rapport with the interviewees, and engaged them in the conversation.

During the process of investigation, ensuring the validity and reliability of data is crucial. To achieve this, the researcher can reveal transparently, all the issues based on their professional background, personal philosophies, and representation of the

research topic from interviewees, while examining the quality standards and reflecting on their bias and limitations of the research. For instance, the researcher expected to hear more complains about the topic of work-life conflict from the informants, but some of the participants redefined the boundary of on and off duty reversely, and declared that they did not feel interrupted by after-hours task assignments from *DingTalk* at all. Even though such claims were not in the minority across all the interviews, I felt quite confused about their responses in a few conversations; and double-checked the answers. Gradually, as I reflected on my perspective, I became aware that the belief of sticking to distinct a work-life boundary was my perception and came from my own traditional mindset. Understanding what interviewees feel at the moment and affirming their perceptions are more important than judging them from my stand. In this regard, their answers were grounded in their personal context, experiences, organisational culture, and socio-cultural stances and are worthy value. How they expressed their own attitudes might be rooted in these values and internalised organisational culture, or merely out of conventional courtesies. Only the researcher's reflection could develop an explicit co-meaning of the phenomenological study with participants.

On the one hand, one-sided reference bias might depend on the rapport between the researcher and interviewees; on the other hand, it could be due to the selections of conversation topic and the interested interviewee oneself. What the researcher should present in the research is to give more voice to those people who knew well about the *DingTalk* phenomenon and were willing to talk about it. Therefore, reflexivity encourages researchers to develop more skills to respond appropriately during the entire interviewing process, even in unforeseen situations (Guillemin and Gillam, 2004).

Admittedly, readers can directly judge the trustworthiness of this study. However, the researcher needs to recognise that the research procedures are flawed (e.g., number of pilots is few), and the measurement may be imperfect (e.g., samples of *DingTalk* users are not adequate). As the conclusions of the current study are based on the self-reports of respondents in a large part, there are likely some problems in

sampling data quality, incomplete coding, and inappropriateness of interpretation, because of self-limitations of the researcher. This whole process is also reflected in the presentation of the design, data collection, analysis, and findings in the thesis.

### **3.5 Ethical Considerations**

Generally, ethical considerations should at least cover three research stages, from the design and plan stage, to the data collection stage, to the reporting stage (Flinders, 1992; Flick, 2007). The main ethical considerations follow the ethical principles and guidelines of the Belmont Report (NCPHSBBR, 1979), such as respect for persons, justice, beneficence, and informed consent.

As to this research, firstly, before interviewing and online survey, an informed consent procedure was conducted, which clearly provided detailed information about the research to all participants. Then, during the data collection, it is important to keep the anonymity of participants and ensure their well-being; for instance, respecting their privacy and allowing the possibility of withdrawal of consent to avoid harm (e.g., respondents in a low job position might suffer disadvantages based on their negative comments on their leader or work institution). Afterwards, when developing the patterns and internal generalisation, researchers should try to be neutral and not infer the traits of a group quickly or arbitrarily. Meanwhile, sustaining a research sensibility for the possibly ignorance by the researcher is crucial.

Sometimes, what participants offer is beyond what was expected, but still relevant to the research context; the researcher needs to consider these issues in a serious and reflective way. Whatever the forms of publication, concrete information such as real name, concrete case, and specific department of institutions, should be anonymized to ensure justice for participants; such data need to be appropriately managed and safely stored for as long as possible. The leading principle should be the accurate interpretation of the original data and analysis (Yin, 2016b). If the researcher feeds back to the participants the findings, then a scientific and careful presentation is necessary (Israel and Hay, 2006). Last, but not least, transparency in conducting the process and the concluding result can make this study clear to readers, such as how

the research was designed, how procedures advanced, and how concepts were constructed. The participants' own raw material could be available to them anytime. Full disclosure of outcomes and communication can make respondents be more likely satisfied. Vice versa, these ethical obligations can also protect the researcher from ethical dilemmas.

### **3.6 Summary**

This chapter presents steps of designing research methodology in this study. Firstly, a pragmatic mixed methods with a social constructionist stance were adopted to guide the whole study. The philosophical assumptions determined the ontology, epistemology, theoretical perspective, and phenomenological approach for this research. Likewise, regarding research philosophy, qualitative interviews were considered the primary approach, with quantitative approach as a supplementary approach to address the research questions (Guba and Lincoln, 1981). As this study needs to gain deeper knowledge and context to better understand and interpret the *DingTalk* phenomenon, in-depth interviews were designed and conducted in several state institutions until data saturation. Afterwards, based on the identified specific themes and variables, four relational hypotheses were proposed to link the qualitative results and quantitative instrument, and then a semi-structured questionnaire was developed. The pilot test and sampling process of questionnaire were assessed to ensure the reliability and validity.

As the researcher must deal with unexpected situations during the data collection, keeping reflexivity during the whole process is of significance. Besides, to ensure the quality of the sequential mixed research, both qualitative and quantitative approaches were examined respectively by justifying validity, reliability, and generalisation issues, as well as the appropriate criteria for each strategy. The ethical considerations for each step in this study were presented in the final part.

In the next phase, analysis of the qualitative and quantitative data is systematically presented as a complete interpretation of the *DingTalk* phenomenon.

## Chapter 4. Findings and Data Analysis

### 4.1 Introduction

Data analysis in the chapter consists of two steps sequentially. Firstly, the current study identifies the qualitative results from the in-depth interviews; within that process, core data are coded and categorised into several themes for the phenomenological research. The identified themes, as critical determinants of employees' JS related to *DingTalk*, are developed into variables of a new survey instrument in the second quantitative phase. Secondly, through data collection from the online survey, the relational hypotheses are tested and the statistical analysis of results can be drawn as a supplemental interpretation for those relevant themes. Based on the data analysis, the chapter addresses the research objectives that to what extent significant factors affect the JS of *DingTalk* practitioners and what are the causal relationships between different variables within this research context.

### 4.2 Thematic Analysis for Interview Data

Phenomenological underpinnings lie in humanistic psychology, and the research objectives of the study are to understand the perceptions, feelings, and lived experiences of JS of *DingTalk* users in the public sector in China. When presenting the embedded meaning in the transcribed text, the researcher needs to be aware of ontological possibilities of humans and recover the taken-for-granted understandings hidden in language in hermeneutic phenomenological inquiry (Bazeley, 2013; Ho et al., 2017). Although difficult, thematic analysis offers a strategy and guide to understand the interpretation of data, and illuminate the unspoken meanings hidden in lived experiences, in hermeneutic phenomenological traditions (Van Manen, 2017). Van Manen (2016) claimed that capturing a phenomenon is to understand the "essential" rather than "incidental". Rather than discovering codes, searching for themes is a more active process to sort the different codes and identify all the relevant themes at the broader level. So, particular analytic questioning themes can be the helpful guides in associating my analysis with the ontological presence of



beings (Ho et al., 2017). Theming the textual data among significant statements is suitable for writing a detailed phenomenological text, which consists of participants' psychological worlds of beliefs, constructs, identity development and emotional experience (Wertz et al., 2011).

Through searching the unique aspects in a contextual data set and comparing the different meanings between patterns, themes emerge as a final product to reflect the essences through a comprehensive and valid data analysis. This approach is both descriptive and interpretative for understanding phenomenon (Vaismoradi and Snelgrove, 2019). Thus, thematic analysis refers to "a complex and creative process of discovering and disclosing structures of meanings that are embodied in human experiences by transcripts or texts" (Van Manen, 2016, p.319). In this way, thematic coding analysis has become the most commonly used method for descriptive or exploratory phenomenological studies of human experiences and perceptions, especially when social constructionists try to understand dynamic multidimensional data (Ozuem et al., 2022).

#### **4.2.1 Coding the Interviews**

Coding originated from the Greek word for "discover"; it is now a heuristic technique to explore problem-solving without specific formulas or algorithms to follow (Saldaña, 2016). The common process of coding includes transcribing numerous types of data into text and conducting recursive data analysis between data and themes. Basit (2003, p. 145) proposed that coding is a crucial aspect of qualitative data analysis. Since raw data are ambiguous to understand, coding is the transitional process and "critical link" throughout raw material, coded text, transcripts, drawn themes, and extensive finding.

In qualitative research, numerous questions and uncertainties might emerge during the lengthy, demanding, and iterative process. In the process, coding helps group the raw content regarding the phenomenon into various meaningful forms, such as similar descriptions in cases, cause-effect relationships between two constructs,

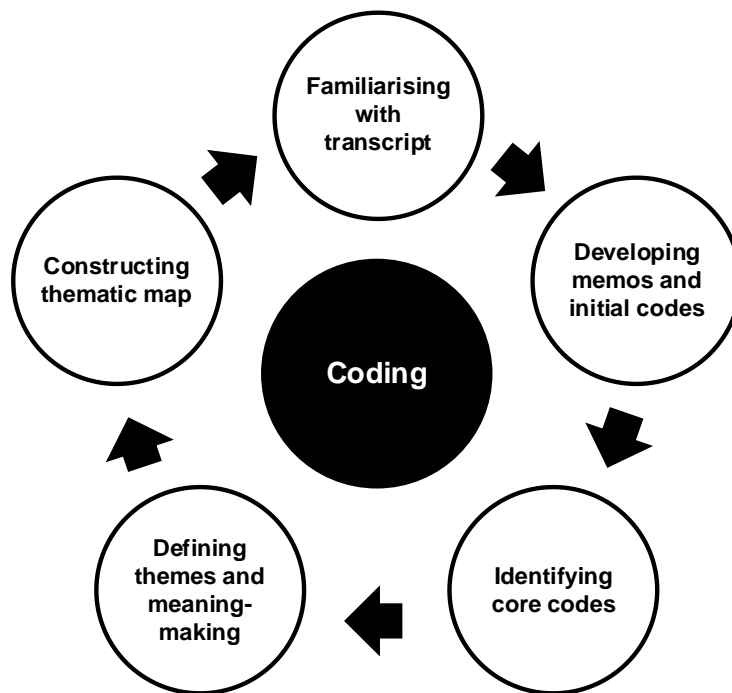
related hierarchical responses, or disparate explanations of alike events (Boyatzis, 1998; Guest et al., 2012).

In the guidelines of Braun and Clarke (2006), researchers adopt six steps to identify the codes and themes in an inductive way. They are: “familiarising yourself with data”, “generating initial codes”, “searching for themes”, “reviewing themes”, “defining and naming themes”, and “producing the report”. This analytic method was considered an exciting advance in qualitative study and widely used in many phenomenological researches (Ozuem et al., 2022). However, the two types of different themes, semantic theme and latent theme identified by Braun and Clarke (2006) need to be constructed flexibly.

However, the approach of Braun and Clarke’s (2006) was said to be limited in interpreting the dynamics and complexity of a specific qualitative inquiry. In line with the argument of Ho et al. (2017), Ozuem et al. (2022) proposed an approach that encompasses five steps for dynamic thematic analysis under a perspective of descriptive phenomenology. They are: “scoping and excavation”, “data segmentation”, “manifestation and categorising the segmented text”, “developing and refining categories and themes”, and “meaning-making and consolidation”. What they advocated as flexible coding is emphasised in the study of Deterding and Waters (2021) as well, which is to support the rigour and credibility of qualitative data analysis.

Given the research aim and the phenomenology paradigm in the thesis, the coding process should be systematic, thorough, and inclusive, with surrounding context during the coding (Given, 2008; Parameswaran et al., 2020). Thus, the data coding process of this research is adapted from Ozuem et al. (2022) and Naeem et al. (2023), shown in Figure 4-1 below.

Figure 4-1. Process of data coding analysis



The whole progress of Figure 4-1 is not linear, but an iterative refining process throughout five phases. Firstly, the researcher transcribed the content of 25 recorded interviews into written text. As shown in Figure 4-1, immersing oneself into the raw material and exploring specific connections between the claims of informants is a starting point of data analysis for researcher, rather than focusing on keywords of high frequency. The raw materials of voice recordings were checked by the researcher and segmented several times in order to familiarise with the conversations, understand the specific context and “locate meaning in the data” for better accuracy (Guest et al., 2012). Vogt et al. (2014) suggested that a researcher needs to manually label the specific segments of information and build blocks of analysis indicators for coding direction.

Secondly, assisted by NVivo 12, minor mistakes in the transcript were modified and then the texts were segmented ready for formal coding process. The researcher can make some memos or further data segmentation of the interview content, to discover several topics from the text (Lewins and Silver, 2007; Ozuem et al., 2022). A coding decision can be considered as “judgment call” that involves the researcher’s personality, subjectivity, and predisposition (Sipe and Ghiso, 2004). Since coding is a strategy of moving data from diffuse and messy text to organised structure (Richards

and Morse, 2013), making decisions is vital to the researcher. Some initial codes generated in this way.

Thirdly, the researcher should check the transcripts back and forth in the overall data set, and look for important categories relevant to research questions. For instance, regarding the code of “work overtime on *DingTalk*”, a subordinate considered it “a hindrance to work-life balance” while a manager took it for granted in the workflow of the state institution. Thus, a researcher can extract a pattern by grouping similar keywords together into chunks, identify a category from different contents, and understand correlations and causations of concepts within a certain sequence (Bryman and Burgess, 1994). Then two categories are respectively developed as “tech-invasion” and “an efficient workflow”.

Further, when interpreting different points of view, multiple realities may form, reflecting multiple ontological, epistemological, and diverse issues of respondents (Creswell, 2013). Meanwhile, the researcher should understand what participants say and interpret why they say it, such as the perceived differences between manager and staff. Through thematising similarities and differences between various interviews, core codes are identified to describe common features of the data set from individual level to organisational setting (Agarwal and Sandiford, 2021).

Besides specific connections among respondents' interpretations, the researcher needs to identify the link between the interview materials and previous literature.

Over 70 different initial codes were identified from the participants' comments related to research objectives and research questions (see Appendix 4 and 5). For example, a lot of ideas emerged from a transcribed response, such as job stability, postgraduate degree, sense of responsibility/ achievement, state-owned institution's workflow, serve the public, data security, confidentiality storage, interpersonal relationship between supervisor and subordinate, civil servant, no boundaries between life and work, and double-edged sword of *DingTalk* -depended mode. When combining responses from several individuals, some codes should be discarded because of weak association with focused topic, or the overlap and redundancy of codes. However, similar messages from various responses were maintained, during

which initial codes were constantly selected and finally reduced to 12 core codes

(Table 4-1).

Table 4-1. From selected initial codes to core codes

Selected initial Codes	#	Core Codes
● Job grade, using time length of <i>DingTalk</i> , education background such as postgraduate degree...	1	Personal information of <i>DingTalk</i> users
● Production of digital era, a workflow of contemporary enterprises, an efficient working way, quality, convenient ...	2	A new multiple workflow and communication
● Non-confidential documents, concerns about the data leakage, trust the security and cloud storage of <i>DingTalk</i> , localised deployment of some functions ...	3	Date security of <i>DingTalk</i>
● Real-time sign-in and locating system, communication and collaboration, remote meeting, flat execution structure, training, and knowledge sharing ...	4	Application scenarios of <i>DingTalk</i> usage and basic functions
● Feel upset by interruption after hours, no boundaries between life and work during pandemic, a hindrance to work-life balance, no day off, no influence certainly ...	5	Personal life be interrupted by using <i>DingTalk</i>
● Module of project management working badly, a generic version, no interfaced to other systems, poor compatibility	6	Disliked functions of <i>DingTalk</i>
● Extranet, the state-owned office system, internal office automation and mail system, hierarchical user rights management mechanism, there is dedicated network and internal system separated from <i>DingTalk</i>	7	Network security for JS and JP
● Organisational training, a new challenge for organisational management, job-demands increase, double-edged sword of <i>DingTalk</i> -depended mode, the paperless office, increasing workload during <i>DingTalk</i> usage...	8	Various organisational management of <i>DingTalk</i> usage
● Serve the public, social recognition, sense of responsibility/achievement, creativity and Innovation, technology increasingly update, harmonious atmosphere, enterprise responsibility, strong working disciplines, good interpersonal relationship...	9	Organisational culture and institutional work atmosphere benefit for JS and JP
● Increase the convenience of work, most good experiences, improve working efficiency and quality, humanistic care of <i>DingTalk</i> usage, routine management as a secretary, positive effect on work, smooth workflow...	10	Benefits of <i>DingTalk</i> usage impacting on JS and JP
● Massive messages leading to low work efficiency, no boundaries between life and work, a hindrance to JS, and psychological disgust...	11	Negative impact on JS and JP during using <i>DingTalk</i>
● Benefits package, job stability, flexible management, working pressure, future development and opportunity ...	12	Various influencing factors of JS unrelated to <i>DingTalk</i>

In the next step, lines of codes associated with the specific text were selected and sorted into relevant themes; then, a variety of potential themes with their associations are sorted from the participants' accounts and organised into a thematic map of *DingTalk* phenomenon (see section 4.2.4). Finally, the basis of a conceptual

framework can be explored from hermeneutical textual interpretations of the thematic map (Ozuem et al., 2022).

#### **4.2.2 Identifying the Themes**

A theme can be considered an outcome of coding, categorisation, or analytic reflection to answer a specific evaluation question, which displays clear meaning in terms of a phrase or sentence (Saldaña, 2016). A theme can tell a “story” from a group of connected codes. A list of themes emerged from systematic analysis of the data corpus of interview transcripts by thinking critically about what respondents are doing and why. Themes reflect how the significant components weave together in this study, and explore the deep and complex meaning behind chronological actions and decisions (*ibid*). Furthermore, the key point of a theme depends on whether it can capture the important information relevant to research questions, and represent a category of patterned meaning, rather than fixed quantifiable measures (Braun and Clarke, 2006).

Especially for qualitative data of interviews, the initial method is to filter the relatively unrelated codes and reduce redundancy based on preceding literatures and researcher’s perceptions. Researchers often focus attention on significant co-occurrences and code frequencies in relation to the statistical nature of content: “content analysis” (Wilcox, 1900; Bernard and Ryan, 2010). Hsieh and Shannon (2015) highlighted that there are three types of content analysis. Among them, conventional content analysis and directed content analysis could be applied to the analytical process of coding schemes, which can help describe a rich phenomenon. Whereas, summative content analysis, which is fundamentally different from the preceding two, has been primarily considered a quantitative method for qualitative data (Morgan, 1993), because it focuses more on describing variation or counting and comparing keywords in different circumstances, without relation to the drawn account. Different from content analysis, “thematic analysis” (TA) is an approach to identify patterns and themes from texts or structural codes through purely qualitative analysis (Vaismoradi and Snelgrove, 2019). In current study, the researcher adopted

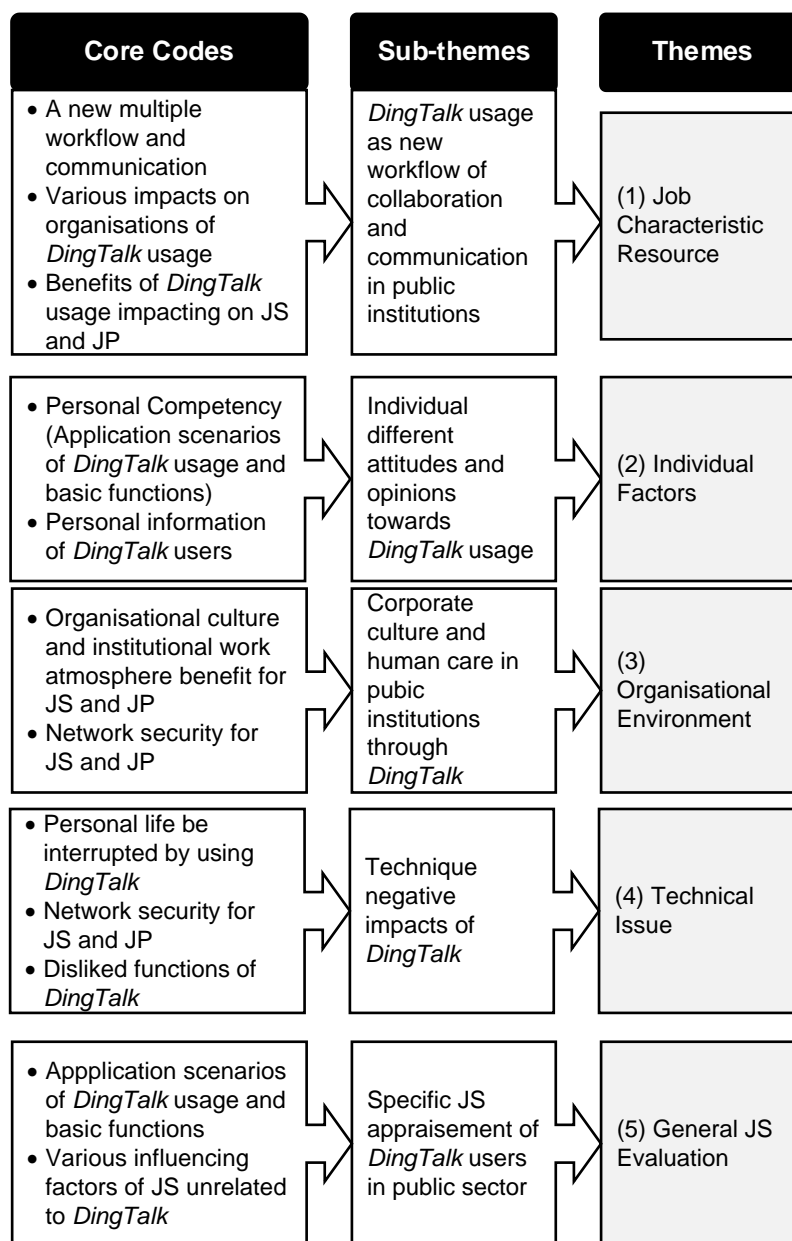
TA rather than summative content analysis to identify the relevant themes from preceding analytic codes, and construct a cultural-contextual picture for the *DingTalk* phenomenon.

Furthermore, thematic analysis still maintains the connections between categories and the source through coding (Given, 2008). Boyatzis (1998) summarised how to bridge between positivism and phenomenology for comprehensive understanding, by making full use of thematic analysis with a draft codebook. Likewise, some scholars suggested that a thematic codebook or report can provide the frequency of themes, which help determine the significance of a particular theme within context, and identify the data more relevant to the specific research questions (Namey et al., 2008; Guest et al., 2012). Throughout the cross-case analysis of codes, a list of relevant concepts and relationships appear in thematic analysis, which can form a web-like network called a thematic map (Braun and Clarke, 2006). The map of this study will be presented in the section 4.2.4.

Aiming at exploring the emerging *DingTalk* phenomenon and associated contextual aspects of public institutions in China, the current study gives priority to a hermeneutical analysis of changing relations or working attitudes, rather than keyword frequencies only in codebook. The dynamic thematic analysis of five steps in phenomenological study of Ozuem et al. (2022), which was based on the basic six-step guidelines proposed by Braun and Clarke (2006), was adopted and applied in the thematic analysis process. Thus, one example of coding an interviewee's transcript is shown in Appendix 4.

Integrating with previous literature points, and ensuring that each theme of a specific concept was related to the research objectives, five potential themes were gradually formed from the 12 core codes (see Figure 4-2 below). The coding summary of what all participants said under each theme and sub-theme are provided in Appendix 5.

Figure 4-2. Refining themes from core codes and sub-themes



The 12 core codes were grouped into five aspects, although the meanings of some codes overlapped in different categories. Finally, selected codes were transformed into the global themes, which were found not only to align with reviewed literatures, but also fit into the research contexts. In order to keep themes coherent, throughout this process, the criteria of Patton (2015) for addressing internal homogeneity and external heterogeneity, were taken into consideration. Identifying the candidate themes should be clearly distinguishable from each other.

Therefore, through rearranging similar codes and refining themes, the candidate themes were selected as the following clusters: (1) *DingTalk* usage as job



characteristics resources in the workflow, (2) Differences in individual factors related to *DingTalk* usage, (3) Organisational environment and culture for the tool usage, (4) Technical issues related to *DingTalk* use, and (5) General JS evaluation of *DingTalk* public-sector users.

#### 4.2.3 Major Themes Relevant to the *DingTalk* Phenomenon

In this phase, the integration of identified themes and contextual descriptions will support the arguments of respondents, and help us interpret the *DingTalk* phenomenon in various scenarios. As the process to identify the similarities and differences between thematic categories is iterative, the research on JS evaluation need to reposit associated conceptions into statement collectively. Among five variables and their associated links, a series of sub-themes and major themes are reconstructed as in Table 4-2 below. According to different expressions from interview transcripts, each theme is of reasonable meanings, connecting with each other to co-construct the *DingTalk* phenomenon.

Table 4-2. Selected codes, major themes, and explanations

Sub-themes	Themes	Definition for Theme	Selected codes
A new way of multiple collaboration and communication in the social workflow	<i>DingTalk</i> as job characteristics resources	Using <i>DingTalk</i> as a new way of communication in various office procedures of social workflow could influence the JS through different affordances (i.e., quality, pervasiveness, efficiency, convenience)	<ul style="list-style-type: none"> <li>● A product of promoting communication and collaboration in digital era</li> <li>● Convenience, efficiency, a novel online workflow, especially during the pandemic</li> <li>● Working skills of partial employees to be trained in public sector</li> </ul>
Individual differences in public institutions	Individual factors	Influencing factors of JS related to their individual factors during using <i>DingTalk</i> in jobs	<ul style="list-style-type: none"> <li>● Education background, age, occupational history, job grade, experiences of accepting and using tool</li> <li>● Individual competency (Chinese QZPS), autonomy, and ESM self-efficacy, innovation in public work</li> </ul>

Sub-themes	Themes	Definition for Theme	Selected codes
Corporate culture of the public sector in China such as PSM, leadership, and enlightened management mechanism	Organisational environment and culture	Commonality of organisational culture, or core value in various types of public institutions for the tool usage, including interpersonal relationships, teamwork, and work practice characteristics	<ul style="list-style-type: none"> <li>● Strong work discipline, organisational commitment, sense of social responsibility to serve public, dedication, work overtime voluntarily</li> <li>● Good leadership, supervision, regular team building, the hierarchical construction of training and knowledge sharing</li> <li>● Agility for innovation in teamwork, and work practice</li> </ul>
Negative impacts and unsupported comments on <i>DingTalk</i> usage	Technical issues of using <i>DingTalk</i>	Limitations and technical downsides during using <i>DingTalk</i>	<ul style="list-style-type: none"> <li>● Problems of data security and confidential file sharing</li> <li>● Poor compatibility with other software, functions in details not specialised for one department</li> <li>● Massive messages leading to low work efficiency and psychological disgust</li> </ul>
Various factors influencing JS of employees in Chinese public context	General JS evaluation in public sector	The self-reported appraisals and various determinants of public employees' JS	<ul style="list-style-type: none"> <li>● Stable work, treatment</li> <li>● Good interpersonal relationships</li> <li>● Sense of achievement</li> <li>● Recognised by society</li> <li>● Sense of belonging</li> <li>● Prospects and opportunities</li> </ul>

### 1) Theme of “*DingTalk* as Job characteristics resources”

When employees were asked about their experiences of using *DingTalk*, the participants all reckoned that the core advantages of this tool are convenient to use, increase efficiency, and innovatively connect people with people, and content with people. No matter routine office approvals, knowledge sharing, or interpersonal teamwork, these activities engage public workers to build online connections and active interactions across boundaries with higher level of psychological safety (Leonardi et al., 2013). Using *DingTalk* is becoming a prevailing way of multiple collaborations and communication in public institutions in China, which include a flexible boundary between on and off work, digital work procedures, quick feedback to clients, and adaptability to innovation. Especially during the pandemic, the significant effect of *DingTalk* usage produced good leverage on workflow. Therefore, most

participants claimed that in contemporary public sector, *DingTalk* activates an irresistible new social workflow. For example, three respondents answered as bellow:

*DingTalk, existing as office software, can improve the efficiency of work, and improve the communication or management between superiors and subordinates. ... Anyway, I think there is no big impact. Yes, it's a regular office software, which should be the biggest product of the digital times. (From No. 15 interviewee)*

*This is our workflow; in my opinion I rather think DingTalk is a better way. .... He can still send you a textual file by DingTalk, or he can also leave you a voice message. At the same time, he also can see your state of online or offline, then he can DING you. The means of contacting people become much more intelligent. As a government workflow or state-owned enterprises workflow, there is no strict rule to say that you should not disturb the staff after work, or you should not talk about work with employees off office hours, especially for certain departments. So, DingTalk is just a means of communication, reflecting the fact that it is easier to find you when work arrangement or quick response is needed. (From No. 22 interviewee)*

*Fixing emergency matters in our state-owned enterprises, and there is no such principle that we cannot contact subordinates after work.... During the pandemic last year, when I was tele-working from home, there wasn't a boundary between on-work and off-work. (From No. 7 interviewee)*

Therefore, according to respondents' contextual descriptions, two significant indicators are identified among several affordances of *DingTalk* from relevant ESM literatures. For example, various functional affordances like visibility, editability, persistence, and searchability can be summarised as one affordance, *quality assistance*, which underlines the characteristic of convenience, usefulness, and efficient productivity when using the tool, even during the pandemic. The other is *pervasive communication*, which reflects the contemporary workflow of public establishments in China. No matter whether a bank, hospital, tax bureau, or China Telecom, they all are committed to good services and contributions to Chinese citizens, industries, and all of society. Thus, using *DingTalk* has becoming an omnipresent, inevitable, and important operating mode in the digital office process. Overall, these two affordances were considered as two crucial dimensions of job resources. Therefore, the associations between measurement items of this variable and JS of employees will be tested as the first hypothesis in quantitative questionnaire.

## 2) Theme of "Individual factors related to using *DingTalk*"

From the qualitative analysis of interviews, it is granted that respondents expressed different opinions of *DingTalk* usage, job views, and individual well-being, especially among public employees in different job positions, departments, and institutions. For example, even in the same institution, the perspectives of general staff differed from the perspectives of manager towards the issue of working overtime off-hours via *DingTalk*. Whereas general workers expressed “*too much pressure in using DingTalk besides other communication tools*” or “*the tool extended working hours and made me feel tired off-hours*”; a manager often emphasised the priority of tasks, and placed more value on the strengths of *DingTalk*’s technology affordances. For instance, one of the technological leaders indicated that:

*First of all, we are **comfortable** with this type of **flexible working way with DingTalk** ... During the quarantine, DingTalk was especially helpful means to prompt many projects, and maintain low cost of products and organisation. As now we are used to using it for project management and communication, so I think there is a **significant improvement in job satisfaction** compared to the previous way of doing things. (From No. 23 interviewee)*

Similar divisions in opinions between senior leaders and ordinary staff were found in several interview responses from the chosen six organisations. The study of Perry and Hondeghem (2008) indicated that the JS of senior officials and managers was found to be generally greater than that among ordinary workers, even in different sectors.

No.23 interviewee said that “*level of JS maybe varies at different career stage and age*”. This statement is consistent with result of Zhang et al. (2018), since the emerging *DingTalk* technology is often more useful to managers than to general staff in form of more resources, information, and network. Accordingly, senior managers tend to be more satisfied with the *DingTalk* way of completing current job.

In addition, one technology manager in a public hospital argued that, according to his experiences,

***Individual personality has a significant impact on job satisfaction. A more altruistic and communicative person will be easily recognised by departments than a less communicative one. For a person who is autonomous and has self-efficacy, one could be encouraged by a lot of motives. Although ..., but one’s personality and proactive opinions will have a great impact on job performance, usually associated with a higher***

*level of satisfaction.... For an employee, there are two significant aspects; **one is competency, and the other is one's autonomy.** (From No. 9 interviewee)*

Here, self-efficacy and autonomy are referred to the great capability to realise goals through one's self-regulation and self-motivation under specific situations (Bandura, 1997). People with high ESM self-efficacy tend to be confident and they are found willing to share knowledge, interact with other users, and deliver information by *DingTalk* to benefit routine work and career development (Hocevar et al., 2014; Manroop et al., 2021).

However, there are opposite views from a section chief in Tax authority:

*I think people's personality or experience will **affect their acceptance of DingTalk** and how often they use it, as well as the role it plays in their daily work. But I don't think it will have any direct impact on job satisfaction. (From No. 20 interviewee)*

Initially, the differences of perceived opinions can be essentially attributed to their distinct individual factors, such as department, age, education background, job ranks and career visions.

Furthermore, the study of Cai et al. (2018) reckoned that enhancing the mediating effects of psychological conditions could maximise the benefits of ESM and positively promote agile performance of employees. An individual's working competency, such as learning skills, innovation, and the confidence to solve problems, are as important as their autonomy and self-efficacy. All these traits are recognised as significant advantages of individuals carrying out *DingTalk*-related jobs.

Additionally, in light of the public sector in China as the research context, the unique Chinese personality dimensions in QZPS (Wang and Cui, 2003), such as altruism, assertiveness, generosity, harmonious interpersonal relationships, confident philosophy of life, and perseverance to success, benefit for high JS of employees. Therefore, the associations between measurement items of this variable and JS of employees will be continually tested as the second hypothesis in quantitative questionnaire.

### **3) Theme of "Organisational environment for *DingTalk* usage"**

Cicei (2012) argued that organisational factors caused more occupational stress than other factors on workers in the public sector, and they could directly affect their organisational commitment and JS negatively.

The current study selected six institutions in the public sector, and the sampling population was mostly set in technical departments and representative occupations of different positions. In each group of interest, public employees using *DingTalk* in diverse departments have distinct job characteristics and various “organisational cultures and values”. For example, the experiences of using *DingTalk* in daily work of a chief technology officer in China Telecom definitely differ from that of a technical manager in a public hospital or a senior technical director of a national bank; however, there is always a relative degree of participant homogeneity based on their ranks in a subgroup and similarities based on working for public institutions in China. From the phenomenological perspective of *DingTalk* usage, the research focuses on the general awareness of *DingTalk* users and universal organisational supports in public institutions. For instance, PSM is generally accepted as an intrinsic motivation to JS of public employees in state institutions (Perry and Hondelghem, 2008). Thus, there are many statements like “*our corporate culture is to serve the public*” or “*the core corporate culture of ours is social responsibility*”. For instance, one technology manager in a public hospital declared that:

*Only if you have a deep understanding of institutional culture or belief, could you really appreciate what we contribute to the process and what value there is in our work. This **cultural aspect** is the motivation or passion for everyone working hard in our post, and it is also a **great determinant of job satisfaction**, I think. (From No. 9 interviewee)*

Specifically, the similar experiences of these technology leaders in public institutions have been influenced by the culture of PSM in terms of organisational commitment, social responsibility, and self-sacrifice. Moreover, the work value motivates and engages them with more *DingTalk* -related tasks, cooperative practices, and even voluntarily overtime working on *DingTalk* anytime. Accordingly, they require active and quick responses from subordinates and technical supports, which provide them with various resources through teamwork, dedication, and strong working supports. Most

mentioned that using *DingTalk* was certainly more satisfying than the existing OA software because of its strengths and constant improvement on many functions.

At the national level, Chinese *DingTalk* users in this study were prone to giving higher priority to work than to personal life, to being more tolerable (“always being online”), and obeying strong workplace disciplines (Wang et al., 2020). At the institutional level, employees’ JS are mostly associated with the specified public contexts and closely related to high level of PSM through working patterns of using *DingTalk* (Ding, 2019b). Thus, they not only tended to express rational perspectives based on their social identity and self-interest, but also internalised a shared organisational culture or values supportive of their public institutions. Therefore, the associations between measure items of this variable and JS of employees is to be tested as the third hypothesis in quantitative questionnaire.

#### **4) Theme of “Technical issues of using *DingTalk*”**

Last, but not least, every tool has technical flaws and might bring negative feelings. Summing up all interviewees’ negative comments, four technology affordances of *DingTalk*’s downsides were outlined, which are various issues from four aspects: tech-overload, tech-invasion, tech-complexity and tech-incompatibility, and tech-insecurity. Firstly, a massive workload is said to decrease labour efficiency, and cause stress and depression. Likewise, there were complaints like:

*DingTalk is like a network, a scattered, unorganised structure, a lot of project groups are here and there. It is easy for a variety of information to fly around, **reducing the efficiency of work.** (From No. 14 interviewee)*

This argument is in line with the previous findings about techno-stress (Matthes et al., 2020), which explained the relationship between occupational stress and an ICT environment based on Transactional Model of Stress (Biggs et al., 2017). The negative impacts of *DingTalk* only emerge when individuals perceive stress beyond their ability to cope, and then evaluate it as a kind of job demand or hindrance. For instance, an urgent task is sent to employees via *Ding*, even after hours, or the platform pushes overwhelming tasks and requests for immediate replies. Therefore, Tech-overload

refers to the perceived negative emotions when *DingTalk* users are required to work faster and longer beyond their capability to cope.

Additionally, one deputy section chief argued that there should be a clear boundary between work and family life, except during the special period of quarantine.

*Since DingTalk is installed on your mobile phone, of course, your personal life time is cut into small pieces by work interruptions from it. Such fragmented time will make life and work have **no obvious boundary**; so, I think if personal well-being is not good, **my job satisfaction will be decreased too.** (From No. 20 interviewee)*

Previously, according to work–family boundary theory, using ICT during off-hours is considered a kind of job requirement or demand. Thus, it blurs the boundaries between on and off work, interferes with the performance of family duties, causes work-life conflict, and further reduces work engagement and JS of employee (Boswell and Olson-Buchanan, 2007). Hence, the tech-invasion of *DingTalk* refers to the situations in which managers always require immediate feedback from subordinates at any time, given the functional strengths of real-time interaction, broad network, and resources by *DingTalk*. Consequently, with the fast-increasing working demands of assumed availability and responsiveness instantly anytime through *DingTalk*, employees are becoming very concerned about the work-life conflict.

Thirdly, *DingTalk* was said not be specially designed for certain departments, thus, there were complaints about its poor compatibility with other office software's functions, which decreased the JS of respondents. So, the third dimension, "Tech-complexity and tech-incompatibility", reflects the extent to which employees perceive the work stress induced by the complex features and functional incompatibility of *DingTalk*, especially for some elder staff (Stranks, 2005). Some training strategies need to be carried out to update some people's operational skills.

Moreover, more than half of participants mentioned that their organisations have two parallel network systems at the same time, and that the dedicated data network, or Intranet, is not connected to external Internet by *DingTalk* platform. So, they have no concerns of data security. Several similar statements were in the form, "*We contact external clients or cooperative partners, or post some ordinary files through DingTalk.*



*But we make confidential files transferring, sharing, recording, and storing only on our own internal network system.*" (From No. 18 interviewee). However, two parallel systems may bring repetitive work; meantime, it also brings many warnings about information leakage to *DingTalk* practitioners. Therefore, the tech-insecurity affordance of *DingTalk* needs to be assessed to find out the extent of employee's concerns about the associated risks, such as data leakage and security threat, in those Chinese institutions. Overall, the associations between measurement items of this variable and JS of employees is to be tested as hypothesis 4 in quantitative questionnaire.

##### **5) Theme of "General JS evaluation of *DingTalk* users"**

As presented in the literature reviews of Chapter 2, JS is a complex and multifaceted concept with many subjective and objective causes. Based on the short scales of JDI measurement, the current JS of employees related to *DingTalk* use were outlined as four aspects: sense of achievement and value, comfortable interpersonal relationship with peers and co-workers, more opportunities for personal growth, and overall job evaluation at present. Other accounts, such as stable treatment, physical working environment, flexible time, or vacations, were put aside in the research because they were irrelevant to *DingTalk* use.

For instance, leaders in China Telcom, public hospitals, tax bureau, and China Media Group mentioned in their interviews that using the tool to "*create social values and solve user's problems*" (From No. 5 and No. 9 interviewee), or "*How many users' needs are satisfied by the products we make*" (From No. 16 and No. 22 interviewee) is the top priority of work. Organisations that can achieve profitability and sustainable growth, which will also "*make me feel satisfied and fulfilled*" (From No.23 interviewee). Several respondents in different institutions reckoned that the *DingTalk* platform benefits personal development through various learning, training programme, and broad social network contacts.

To sum up, after identifying various comments, relationships, factors, and the specific context by thematic analysis, these five themes were developed by iterative pattern categorisation, coding, and analytic processes. In this way, the qualitative findings

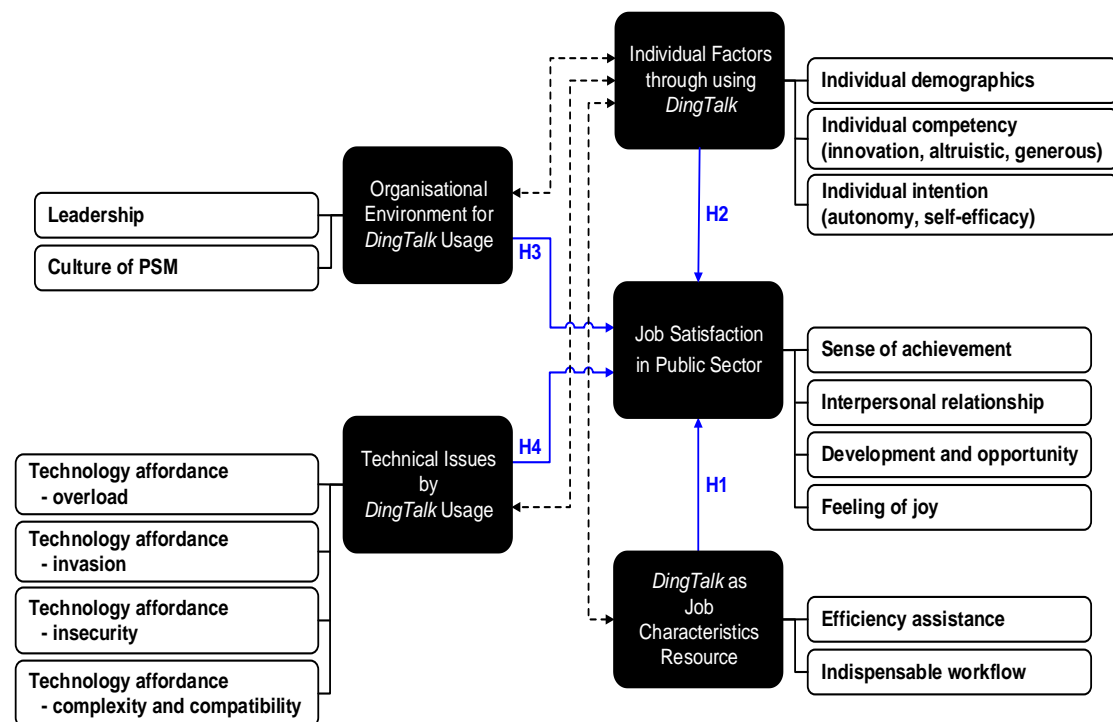
were used as a foundation to test following hypotheses and develop the relational instrument between IVs and DV in subsequent quantitative analysis.

#### 4.2.4 Thematic Map

A final thematic map was developed with four candidate themes as input variables and one theme as output variable of “overall job satisfaction of employees in public sector” (see Figure 4-3 below). The five themes are relatively independent from each other through conceptualization of distinct comments by thematic analysis. Within each theme, a detailed analysis of lived experiences and insights can be described together and sub-themes are always vital for a deeper presentation (Attride-Stirling, 2001). Therefore, based on thematic analysis from interview data, primary five themes and relevant subthemes are identified into a map (see Figure 4-3).

Compared to previous conceptual models in chapter 2 and 3, their associations and four relational hypotheses are reconstructed as the qualitative foundation for next quantitative study.

Figure 4-3. Final thematic map



Briefly, in this thematic map, five variables in the centre are global themes/ constructs relevant to *DingTalk* phenomenon, and significant components/ indicators of each

variable are identified from qualitative analysis of interviews and literatures.

Nevertheless, the interrelations between every two constructs are yet unclear, and dotted lines are used to link them. Moreover, the four hypotheses (H1-H4) with full lines are proposed in the figure, between four IVs and outcomes of JS as DV. The next section provides more supplementary explanations from quantitative data to interpret how they constitute a process and how significantly they influence the consequence of JS.

As for the next phase of the research, the scope and weight of each theme and their indicators are clearly illustrated, with a combination of analyst's narrative and enough survey data to demonstrate the prevalence of the whole research phenomenon (Braun and Clarke, 2006). After transforming qualitative constructs into quantitative form, further various relationships between relevant constructs and individuals' JS will be reflected through significant extent of statistical analysis in next phase.

### **4.3 Data Analysis of Semi-structured Questionnaire**

A semi-structured questionnaire was used to gather more information related to the JS of employees in the public sector and to provide supplemental descriptions for research patterns across a large number of participants (Krosnick, 2018). As last section mentioned in thematic map (Figure 4-3), whether the relationship is significant between IV and DV, and to what extent respondents' responses agreed with the qualitative findings, such as perceptions and opinions from the interviews.

Therefore, except those interviewees and 15 public employees in pilot questionnaire, there are other 460 valid responses in various public institutions collected from the online survey during 19th May to 13th June. To promote more responses, the researcher tried to contact more boundary spanners in public sector, send the link to maximise publicity, and provided lottery incentives to respondents during the phase. The final sampled number of *DingTalk* users are shown in figure 3-4 before. Afterwards, a sequence of data processing operations and statistical tests were conducted to examine the quantitative data, as shown in Figure 4-4.

Figure 4-4. Flowchart of data statistical analysis

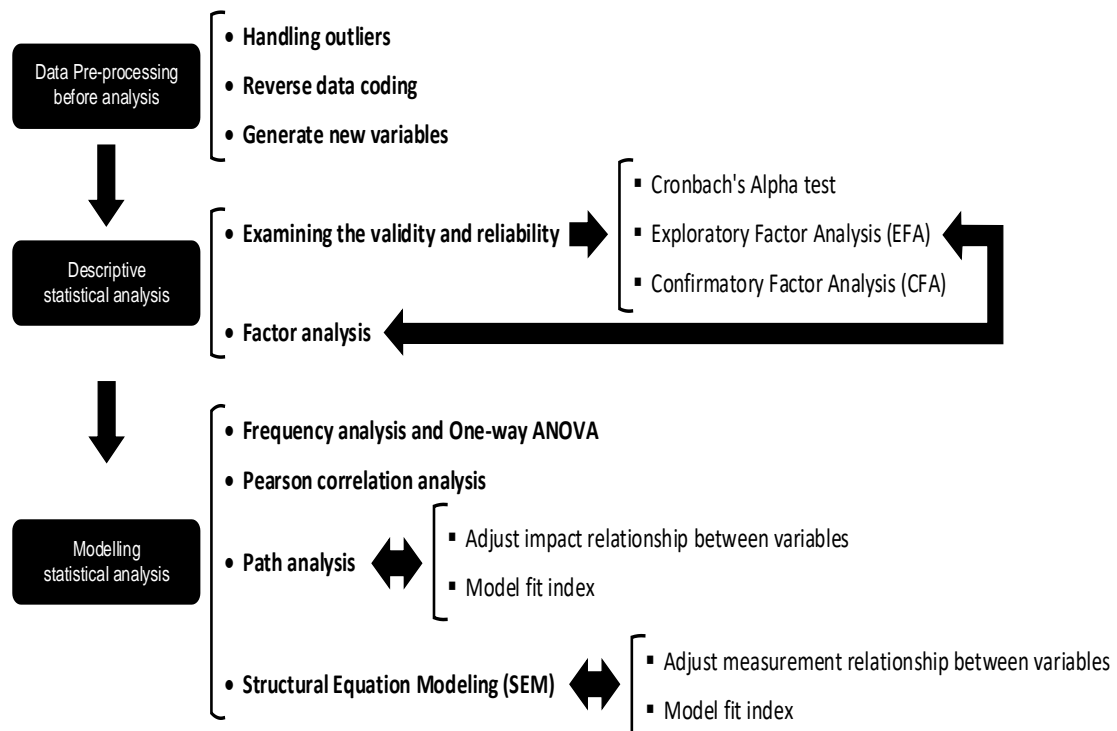


Figure 4-4 highlights mainly three stages: firstly, data pre-processing before analysis; secondly, an examination of overall samples through reliability testing with Cronbach's alpha coefficient, and validity by EFA, CFA techniques, and factor analysis; thirdly, subsequent modelling statistical methods, such as one-way analysis of variance (ANOVA), path analysis, and structural equation modelling (SEM). All statistical techniques are used to develop the final model. For each stage, the specific analysis techniques, their statistical indicators and evaluation criteria are described in the following sections.

### 4.3.1 Data Pre-processing of the Questionnaire

Statistical analysis of questionnaire data is considered as a logical reasoning process for online survey, in forms of different demographics of respondents, and their attitudinal and behavioural responses related to *DingTalk* phenomenology. As there are six chosen public institutions in the survey, thus in each organisation, the questionnaire was distributed in different departments and delivered to employees of as many different job positions as possible.

Initially, 460 responses are collected from questionnaires. All records were checked effective and completed, and there were no outliers.

Afterwards, in the section of “Technical issues of *DingTalk* usage”, ten answers to questions were reversed through “data coding” of SPSSAU because the answers’ scores were inverted. For instance, if an employee strongly agrees to “I am often overwhelmed by the constant tasks posted on *DingTalk*”, the less job satisfied feelings one has. Thus, the statistic answers need to be reversed.

According to the questionnaire design, the 28 response-structured questions were separated into five dimensions, then five latent variables were generated through the data coding function of SPSSAU.

### **4.3.2 Descriptive Statistical Analysis**

This section will discuss the relationship between IVs and DV through data analysis techniques in SPSSAU, for instance, ANOVA, Pearson correlations and factor analysis. Besides, the appropriateness of the data analysis, the validity and reliability of survey instrument are to be examined.

#### **4.3.2.1 Reliability**

Based on five themes from interview data, reliability analysis can help identify data-driven correlations among these five factors for an overall interpretation (Hesse-Biber and Leavy, 2008). Considering each construct as a unit, and conducting five reliability tests for each unit, the statistic results are combined as follows. Taking an example, in the dimension of “Technical issues of *DingTalk* usage”, Cronbach’s alpha of eleven questions (Q.15-Q.25) was calculated as 0.901 in Table 4-3.

Table 4-3. Reliability statistics of five dimensions

Dimension	Factors	Question Item	Cronbach's Alpha of Dimension
1A	<i>DingTalk</i> as a job characteristics resource	Q.1-Q.5	0.943
2B	Individual factors influencing JS related to <i>DingTalk</i>	Q.7-Q.10	0.956
3C	Organisational factors influencing JS related to <i>DingTalk</i>	Q.11-Q.14	0.938
4D	Technical issues of <i>DingTalk</i> usage	Q.15-Q.25	0.901
5E	The general JS appraisal	Q.26-Q.29	0.905

Generally, higher than 0.7 is considered an acceptable degree of internal consistency (Hair et al., 2019). Regarding the Cronbach's alpha of each dimension, the value is higher than 0.9 respectively, which indicate that the scales are excellently reliable and the internal consistency of the dimensions is good.

#### 4.3.2.2 Validity

As mentioned before, the questionnaire in this study was mainly adapted from scales in the literature and some scales were self-developed by the researcher; the EFA is necessary to summarise numbers of original measurement items into composite factors without information loss (Hair et al., 2019). EFA can help carry out factor concentration for the model through multiple repeated cycles and remove deviated items from the scale questions until there is a reasonable result of selected variables (*ibid.*). Afterwards, CFA was used to measure whether the correspondences between factors and measurement (scale items) were consistent with the researcher's predictions. The CFA test can help confirm correspondences to ensure structural validity, convergent validity, and discriminant validity.

Firstly, all the scaled-response answers should be tested through the check of Kaiser–Meyer–Olkin (KMO) and Bartlett.  $KMO > 0.8$  and  $p < 0.05$  in the Table 4-4, indicate that factor analysis is suitable for those factors from the quantitative questionnaire.

Table 4-4. Test of KMO and Bartlett

	<b>KMO Value</b>	<b>0.907</b>
	the approximate chi-square	6915.230
<b>Bartlett Sphericity Test</b>	<i>df</i>	378
	<i>p</i> value	0.000

#### 4.3.2.3 Factor Analysis

During the data reduction process of EFA, the standardised factor loadings of all questions were all greater than 0.6 in absolute value; significant correlations were shown between factors (latent variables) and analysis measurements (explicit variables) ( $p < 0.001$ ).

When the commonness (common factor variance) value of an analysis item is less than 0.4, the corresponding item needs to be deleted or ignored. Additionally, based on the load factors after rotation and the interrelationships between measurement item and the variable, the representative factors were selected, so five new factors were extracted, recategorised and redefined.

As a result of data computation, the representative items in construct A were reduced to three ones after thoughtful consideration, making up new **A'**. The items of Q.7-Q.10 in construct B and Q.11-Q.14 of construct C were grouped into one dimension, and a new factor **B'** was defined as "Individual and organisational factors influencing JS of *DingTalk* users". Then, the original construct C was separated into two factors: **C'** and **D'**, which are "Negative influence of *DingTalk* usage" with items of Q.15-Q.19 and "Technical function issues of *DingTalk* usage" with items of Q.20- Q. 25. The factor **E** "general evaluation for JS" remained unchanged with items of Q. 26- Q.29.

As a whole, the explained variance of the five factors after rotation were 31.290%,16.469%,11.545%,11.016%,7.943% and the explained variance after rotation was 78.262% cumulatively.

Afterwards, CFA was applied to test the extent to which the theoretical pattern of factor loadings on specific variables represented the actual data. CFA helps reveal how well the preconceived measurement theory can be confirmed by examining the

structural validity, convergent validity, and discriminant validity (Hair et al., 2019). With CFA, the Average variance extracted (AVE) is calculated as the mean variance extracted among the items of a construct, and it is a summary indicator of convergence (*ibid*).

At the beginning, five CR values in conjunction with the model exceeded 0.7, except one of the AVE values was estimated to be lower than 0.5. This suggested adequate convergent validity between factors and analysis measurements, but the model still needed to be adjusted and reanalysed.

Thus, to ensure standardised loadings with criteria of above 0.7, three measurements in dimension **C'** were removed and two items were deleted from dimension **D'**. The items that were left items were found to be more concise and distinct. Therefore, a set of new constructs and measurement items was established as shown in Table 4-5.

Table 4-5. The measurement items of variables and AVE, CR

#	Factor	Measurement Item of Question	AVE Value	CR Value
<b>A'</b>	<i>DingTalk</i> as a job characteristics resource	Q3, Q4, Q5	0.819	0.930
<b>B'</b>	Individual and organisational factors influencing JS related to <i>DingTalk</i>	Q7-Q14	0.696	0.948
<b>C'</b>	Negative influence of <i>DingTalk</i> usage	Q15, Q17, Q19	0.578	0.804
<b>D'</b>	Technical function issues of <i>DingTalk</i> usage	Q21, Q22	0.620	0.763
<b>E</b>	The general JS appraisal	Q26, Q27, Q28, Q29	0.704	0.905
Analysed Samples		291		

Table 4-5 shows the effective sample size for this factor analysis was 291; this size is adequate and exceeds the number of overall items by 10 times. The model fits of AVE and CR were acceptable as discussed as below; both demonstrated good convergence validity of the five factors.

Discriminant validity refers to the extent that a construct is truly distinct from other constructs (Hair et al., 2019). If the AVE square root of each factor is greater than the maximum correlation coefficient between the factor and other factors, it has good discriminant validity. High discriminant validity indicates that a construct is unique



and measured items provide significant differences for one latent construct more than for others. The calculated results of five factors are shown in Table 4-6 below.

Table 4-6. Pearson correlation and AVE square root of five factors

	A'	B'	C'	D'	E
A'	<b>0.905</b>				
B'	0.708	<b>0.834</b>			
C'	-0.253	-0.269	<b>0.760</b>		
D'	-0.186	-0.234	0.510	<b>0.787</b>	
E	0.333	0.367	-0.219	-0.283	<b>0.839</b>

In Table 4-6, the square root of the AVE of each construct is denoted in bold and italic, while the inter-construct correlations are shown off-diagonally. The AVE square root value of each factor provides good evidence of discriminant validity for the CFA model.

In summary, the validity of quantitative data can be ensured by the above tests.

### 4.3.3 Modelling Statistical Tests

This section will discuss the quantitative correlations between five constructs, and test the hypotheses between IVs and DV to build up the model through other data analysis techniques in SPSSAU, for instance, frequency analysis, ANOVA, path analysis, and SEM technique.

#### 4.3.3.1 Frequency and Variance Analysis of Categorical Data

Frequency analysis was used to calculate the frequencies and proportions of choices for certain types of demographic data (e.g., gender, institution categories, job position, educational background, etc.). Categories of basic demographic information are important as behavioural characteristics and attitudes for subsequent analysis. Additionally, one-way ANOVA (Analysis of Variance) can help identify the statistically significant differences of a single factor on five dimensions, after the check of the normality requirement for DV: **E**. Hence, the significant demographic information of

respondents was categorised as representative groups and investigated as IVs through one-way ANOVA at the section. The results are presented in Table 4-7.

Table 4-7. Frequency analysis of categorical data

<b>Category</b>	<b>Type of Options</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Age group</b>	18-24 years old	36	7.83
	25-34 years old	<b>230</b>	<b>50.0</b>
	35-44 years old	<b>152</b>	<b>33.0</b>
	45-54 years old	35	7.61
	Over 55	7	1.52
<b>Highest education qualification</b>	Bachelor Degree	<b>343</b>	<b>74.57</b>
	Master degree or above	<b>112</b>	<b>24.35</b>
	Degree of high school (technical secondary school) and below	5	1.09
<b>Job title</b>	Technical professionals	67	14.6
	Middle manager	74	16.1
	Others	13	2.8
	Staff	<b>298</b>	<b>64.8</b>
	Senior manager	8	1.7
<b>Average length of using <i>DingTalk</i> everyday</b>	Below one hour	<b>299</b>	<b>65</b>
	1-3 hours	74	16.09
	4-6 hours	33	7.17
	Above 7 hours	<b>54</b>	<b>11.74</b>
<b>Organisations in public sector</b>	Automotive manufacturing industry	10	2.2
	Others	83	18.0
	Health care	<b>195</b>	<b>42.4</b>
	Broadcasting and TV Propaganda, journalism and publishing	11	2.4
	Social management	59	12.8
	Technological information	61	13.3
	Economy	41	8.9
<b>Totally</b>		<b>460</b>	<b>100.0</b>

In the Table 4-7, some notable statistical items in the first section of questionnaire are calculated.

From the general report of online survey, the result shows that the population of female respondents (n= 267, 58%) was significantly higher than male respondents

(172, 37%). However, through ANOVA test, the factor of gender has no significant statistical differences for five dimensions A' to E.

The age group of respondents in table above reveals that 83% of the respondents were 25 to 44 years old; they are Millennials and the vital force of employees. There were 36 people of age 18 to 24 and 35 people in the range of age 45 to 54. Through an ANOVA test, the factor of age was found to have no significant differences for five dimensions of A' to E. However, a reasonable age distribution, especially primarily the productive age group, is a good driver as diverse people can make the biggest contribution to an organisation.

From the highest educational background of employees shown in Table 4-7, there were 74.57% with a bachelor degree and 24.35% with a master degree or above. Their educational degree basically meets the general requirements of public institutions in China; this aspect is linked to their learning capabilities to some extent. Through an ANOVA test, the factor of educational background did not show significant differences for three dimensions of C' to E, but a significant moderating effect on paths B' -> A and A'->E (e.g., *DingTalk* as a job characteristics resource; Individual and organisational factors influencing JS of *DingTalk* users) at the level of 0.05 ( $p < 0.05$ ). Generally, this statistical finding provides evidence that work staff with a higher educational degree are often equipped with better learning capabilities and make good use of emerging technologies as a job resource.

In reference to job position, the proportion of respondents who were general staff was 64.8% (more than half). The ratio of technical professionals is almost the same as that of middle managers, around 15%. Eight senior managers or directors in the public sector completed the questionnaire in the survey. Through an ANOVA test, the factor of job position does not show significant differences for four other paths, but a significant moderating effect on path A'-> E (e.g., The general JS appraisal) at the level of 0.05 ( $F=2.921$ ,  $p=0.021$ ). The higher the job rank, the higher the probability of the overall JS. This finding is also consistent with previous qualitative analysis, which were confirmed by responses of middle manager in interviewees.

In reference to the average duration of using *DingTalk* during a working day, 65% of participants used the tool less than one hour every day, whereas, 11.74% of participants even worked on the platform more than 7 hours. Through an ANOVA test, average time length of using *DingTalk* on daily work had no significant effect on paths to C' and D' (e.g., technical function issue of *DingTalk* usage) ( $p>0.05$ ), as shown in Table 4-8 below.

However, according to their interviews, the time length of using *DingTalk* for work will greatly impact their personal emotions and working attitudes towards their job.

Therefore, as expected, a statistically significant impact of using *DingTalk* time on four dimensions were respectively compared in following Table 4-8. The specific differences between the categorised groups can be determined by comparing their mean values.

Table 4-8. One-way ANOVA of *DingTalk* using time

	Average duration of using <i>DingTalk</i> everyday (mean $\pm$ std)				F	p
	1-3 hours (n=74)	Below 1 hour (n=299)	4-6 hours (n=33)	Above 7 hours (n=54)		
A'	<b>3.57<math>\pm</math>1.18</b>	2.88 $\pm$ 1.35	3.35 $\pm$ 1.23	3.47 $\pm$ 1.27	7.706	<b>0.000**</b>
B'	<b>3.57<math>\pm</math>1.37</b>	2.88 $\pm$ 1.47	3.18 $\pm$ 1.41	3.47 $\pm$ 1.51	5.998	<b>0.001**</b>
C'	3.06 $\pm$ 1.31	<b>3.15<math>\pm</math>1.48</b>	2.64 $\pm$ 1.26	2.39 $\pm$ 1.56	4.978	<b>0.002**</b>
D'	2.79 $\pm$ 0.89	2.81 $\pm$ 0.97	2.55 $\pm$ 0.96	2.50 $\pm$ 1.06	2.176	0.090
E	3.47 $\pm$ 0.52	3.21 $\pm$ 0.57	<b>3.49<math>\pm</math>0.48</b>	3.19 $\pm$ 0.53	4.410	<b>0.005**</b>

NOTE \*  $p<0.05$ , \*\*  $p<0.01$

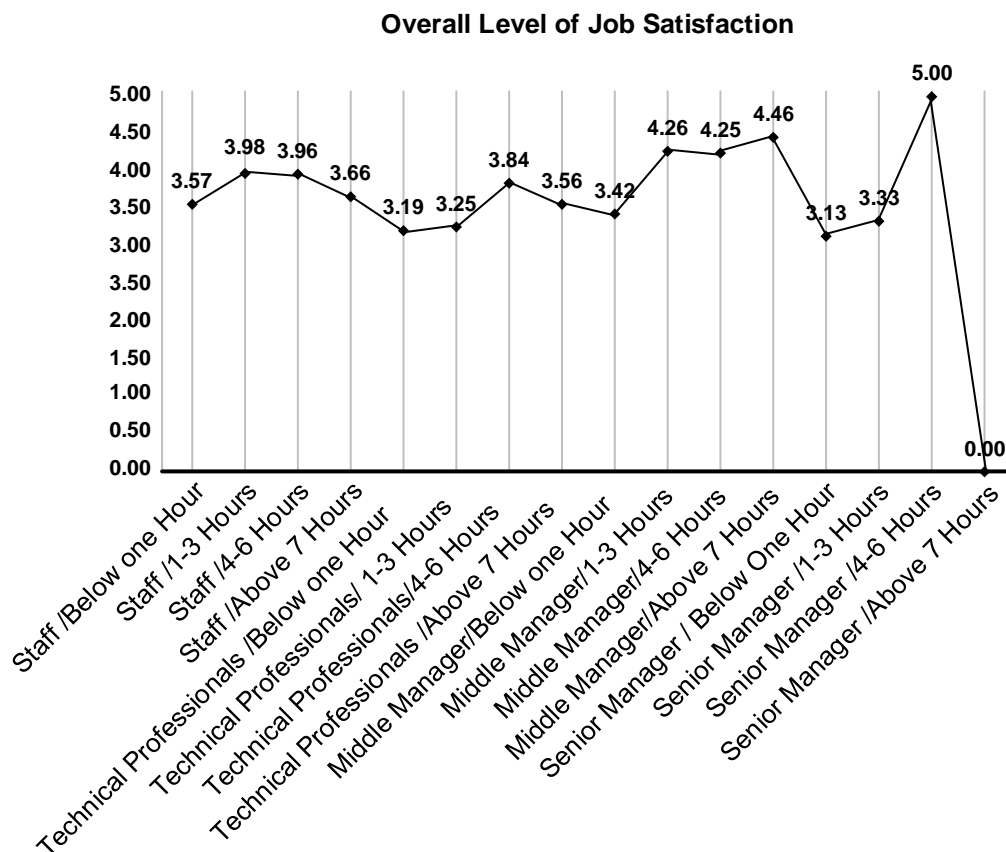
The factor of duration time of using *DingTalk* daily showed significant moderating influences on path **A'**-> **E** and **B'**-> **E** (i.e., **A'**: using *DingTalk* was considered as a job resource; **B'**: personal and organisational factors influencing JS), especially for those users of 1-3 hours daily. For the respondents using *DingTalk* for less than one hour, the impact of the factor is also found significantly on dimension **C'** (i.e., negative influence of *DingTalk* usage), which probably can be explained as lack of use leading to dissatisfaction of *DingTalk* users.

However, the factor shows no significant differences on dimension **D'** (i.e., technical function issues of *DingTalk* usage), probably because technology issue is more

related to users' operation skills than duration of using *DingTalk*. Furthermore, the *DingTalk* users of over 7 hours were found not the most negative critics in the table. For their general JS appraisal (i.e., dimension **E**), the most significant impact was found on the group of users of 4-6 hours, since the platform almost occupied their most time of a working day.

The four types of "Job position" and four different "Average duration of using *DingTalk* every day" were combined and the identified samples were categorised into 16 groups. Thus, the correlations to the factor of using *DingTalk* time and the DV: **E** can be illustrated as in Figure 4-5.

Figure 4-5. Average overall satisfaction in different sample category



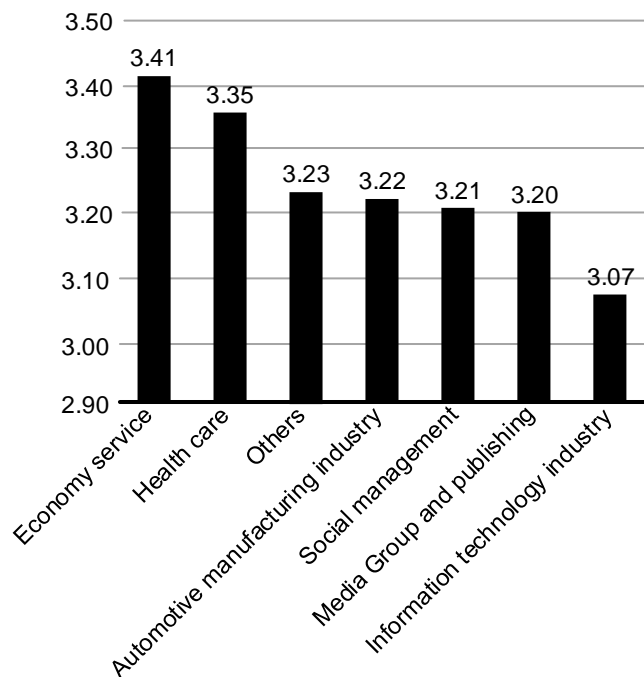
For instance, for general staff using *DingTalk* every day, the most satisfying working hours for them are 1 to 3 hours, as the mean value of 3.98 in the figure 4-5.

Whereas, the technical professionals using *DingTalk* 4-6 hours daily were shown to have the higher level of satisfaction than others' in their groups. Nevertheless, even middle managers using *DingTalk* more than 7 hours per day, showed fairly high

satisfaction. For the group of senior managers, the duration of using *DingTalk* of 4 to 6 hours was associated with the highest overall satisfaction value, shown as 5 in the figure 4-5. This finding indicates that the longer usage of *DingTalk* as a kind of job resource: the leaders can gain more effective information, more communication, and cooperation to solve problems. This indicates that, they are more likely to perform better with creativity, decisiveness, autonomy, and collaborative mindset, which lead to higher JS.

Last, but not least, the current survey covers different types of organisations, for instance, 42.4% of respondents were from public hospitals, the rest were in other state institutions. This study focused on the impact of the essential feature of an institutional type on the path: **A' -> E** with an ANOVA. However, the nature of institutional type does not show significant differences for other paths, but a significant moderating effect on **A' -> E** (i.e., The general JS appraisal) at the level of 0.05 ( $F=2.503, p=0.016$ ). From this dimension **E**, the specific average variances of seven typical institutions were compared in the Figure 4-6 below.

Figure 4-6. Variance comparisons for different organisations



For instance, public employees in economy service, such as Tax bureau provided approximately 8.9% of all responses, which showed most significantly differences in

the final appraisal of JS (variance of 3.41). Likewise, 42.4% of all participants, working in Health care, showed significantly differences in the result (variance of 3.35). Whereas, employees in information technology industry, such as China Telecom provided approximately 13.3% responses, with least significantly differences to the overall JS appraisal (variance of 3.07).

The Figure 4-6 indicates that the type of institution is indispensable for the interpretation of overall JS appraisal; hence, institutional differences can be explained within a comprehensive context as a moderating effect on employees' JS.

#### 4.3.3.2 Pearson Correlation Analysis

The Pearson correlation coefficient was used to indicate the strength of the correlation between the five dimensions or latent variables. Generally, the correlation coefficient is a real number between [-1, +1]. When the value is between [-1, 0], it indicates that there is a negative correlation between the factors; whereas a value between [0,1] indicates that there is a positive correlation between the factors. If the correlation coefficient is 0, there is no correlation between the two (Hair et al., 2019). Though the Pearson correlation analysis, “the general JS appraisal” showed significant correlation with other four dimensions ( $p < 0.05$ ), as in Table 4-9, which confirms previous qualitative findings.

Table 4-9. Pearson correlation analysis

Dimension	E- The general JS appraisal	
A' - <i>DingTalk</i> as a job characteristics resource	correlation coefficient	0.350**
	p value	0.000
B' - Individual and organisation factors influencing JS related to <i>DingTalk</i>	correlation coefficient	0.344**
	p value	0.000
C' - Negative influence of <i>DingTalk</i> usage	correlation coefficient	-0.183**
	p value	0.001
D' - Technical function issues of <i>DingTalk</i> usage	correlation coefficient	-0.192**
	p value	0.000

**NOTE** \*  $p < 0.05$ , \*\*  $p < 0.01$

In the Table 4-9, a significant and positive correlation can be identified between dimension A' and dimension E with correlation coefficient of 0.35 and  $p < 0.01$ . Similarly, the descriptive data in the table shows there is a positive and statistically significant relationship between dimension B' and dimension E based on Pearson correlations of 0.344 and  $p < 0.01$ . However, a negative and significant correlation was found between dimension C' and dimension E (e.g., the Pearson correlation of -0.183, and  $p = 0.001$ ). Likewise, the Pearson correlation between "the overall JS appraisal" and "technical function issue of *DingTalk*" is -0.192, which indicates that there is a negative correlation between dimension D' and dimension E.

#### **4.3.3.3 Path Analysis**

Path analysis is used to analyse all relationships between any two constructs and the strength of the paths, and a straight arrow linking two factors can be called a direct relationship. It starts from the predictor variable and the arrowhead points to the DV. For the current study, the direct and indirect paths were identified in a diagram for the developing model.

There are three steps for path analysis by SPSSAU.

Firstly, an initial model was developed according to the researcher's previous test of Pearson correlations, and the  $p$  values of path coefficient between different factors were checked. A significant and positive influence from factor A' to factor E was found with  $p = 0.001$ , and a similar situation from B' to E with  $p = 0.04$ . The other two path coefficients of B' → E and C' → E, did not show significant influences because of  $p > 0.05$ . Thus, these two path relationships needed to be removed.

Secondly, the model needed to be adjusted. The covariance matrix and correlation are considered as input to calculate the strength of relationships in Path analysis.

Meanwhile, when indicators of a model fit fail to reach the criteria of modeling, the correlation needs to be re-established based on covariance MI indicator. Thus, the summary of regression coefficients among different factors are presented in the Table 4-10 below, and all  $p$  values showed significance between each pair of path relationship.



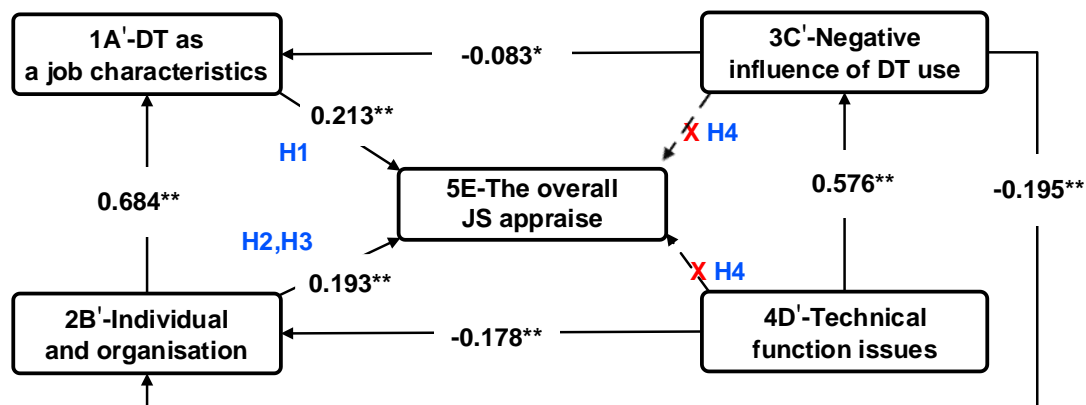
Table 4-10. Summary of paths and model regression coefficients

X → Y	Non-standardised Path Coefficients	SE	z (CR)	p	Standardised Path Coefficients
A' → E	0.102	0.034	2.978	0.003	0.213
B' → E	0.090	0.033	2.689	0.007	0.193
B' → A'	0.667	0.039	17.091	0.000	0.684
C' → A'	-0.085	0.041	-2.075	0.038	-0.083
C' → B'	-0.203	0.066	-3.089	0.002	-0.195
D' → B'	-0.200	0.071	-2.820	0.005	-0.178
D' → C'	0.620	0.048	12.911	0.000	0.576

**NOTE** → indicates impacting relationship of paths

Seven paths are direct relationships as in Table 4-10. The numbers with \* in the figure indicate standardised path estimates are significant in impacting relationship (\*p < 0.05, \*\*p < 0.01). Therefore, the path relationships among five variables are displayed visually in the following Figure 4-7.

Figure 4-7. The path diagram of five constructs



From the above, factor A' is found a direct and significant variable impacting on E (e.g., overall appraisal of JS), so does factor B' impacting on E directly. And factor B' contains two aspects, so the hypotheses of H2 and H3 are confirmed their contributions to employee's well-being significantly. In line with the extant literatures, factor B' and factor A' have been proven their influences on JS; this study confirms their direct influences on JS empirically by accepting three hypotheses of H1, H2, and H3 (A'→E and B'→E).

However, both C' and D' were found no direct impact on factor E statistically. Therefore, H4 (D'→E) was rejected according to the statistical tests of path analysis. No matter the negative experiences or technical functional issues of using *DingTalk*, they were found not the determinants of JS; whereas, they might have indirect effects on the final JS evaluation through mediating effect of factor B'.

Table 4-5. Model fit index of path analysis

Commonly Used Indicators	$\chi^2$	df	p	$\chi^2/df$	GFI	RMSEA	RMR	CFI	NFI	NNFI
Criteria	-	-	>0.05	<3	>0.9	<0.10	<0.05	>0.9	>0.9	>0.9
value	3.906	3	0.272	1.302	0.995	0.030	0.018	0.998	0.992	0.993

Other Indicators	TLI	AGFI	IFI	PGFI	PNFI	SRMR	RMSEA 90% CI
Criteria	>0.9	>0.9	>0.9	>0.9	>0.9	<0.1	-
value	0.993	0.973	0.998	0.199	0.297	0.028	0.027 ~ 0.101

Default Model:  $\chi^2(10) = 468.349, p = 1.000$

After adjusting the model repeatedly, the model fit indicators were up to the standard range, as shown in Table 4-11 above.

For instance,  $\chi^2/df$  is 1.302, absolute fit index GFI is 0.995, RMSEA is 0.03, RMR is 0.018, incremental fit index CFI is 0.998, NFI is 0.992, and NNFI is 0.993. This table indicates that the model has achieved a good fit by the “most likely” path estimates of the above hypotheses. It shows the practical significance of the results being applied to the population.

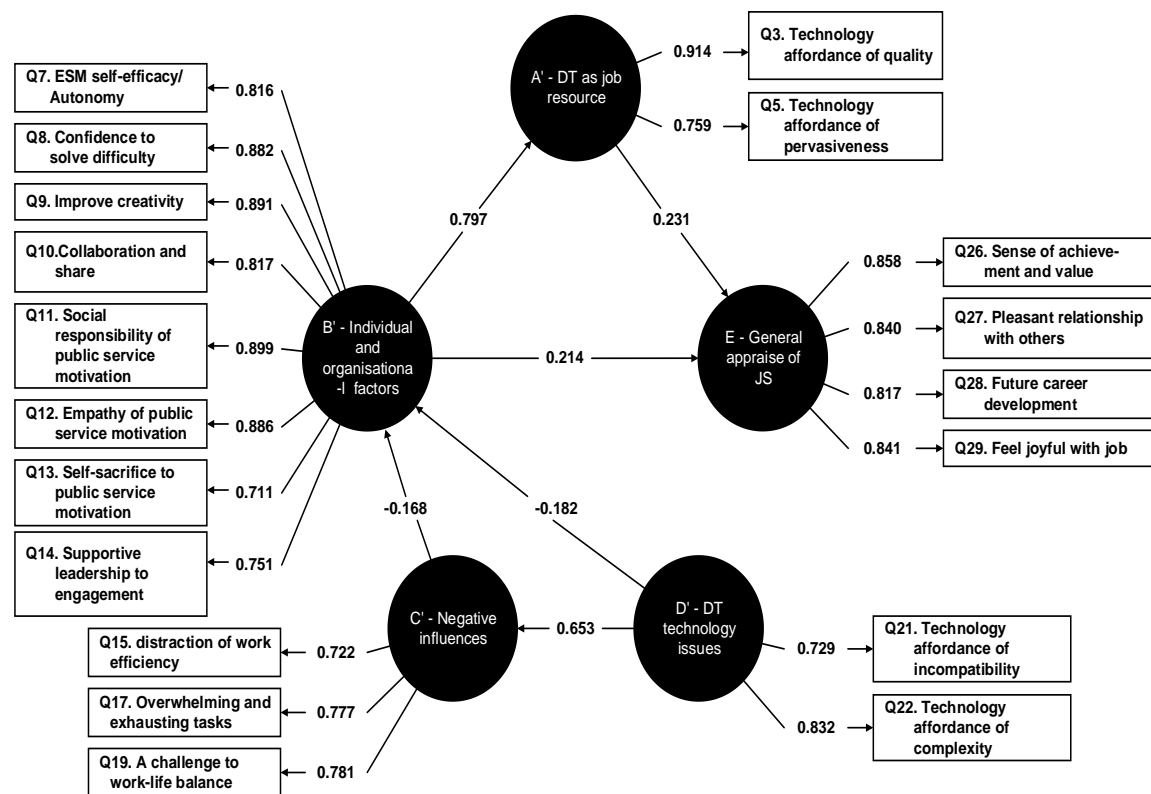
#### 4.3.3.4 SEM Analysis

SEM is a multivariate data analysis method that can be used to investigate the influencing relationships between multiple latent variables. The method consists of two components: the measurement relationship and the structural relationship. The structural relationship has been tested in the above path analysis, linking IVs to DV. The measurement relationship was examined through previous CFA test, which assessed the contribution of each scale to the factor (Hair et al., 2019).

Extending prior work on the impacting relationships from path analysis, the current study put all measurement relationships and constructs into the framework, then

developed the model by analysing standardised path coefficients. Similar to path analysis, if the coefficients of this model did not show statistically significant, it indicated that the relationship was too poor and to be adjusted. If indicators of model fit fail to reach the criteria, there are two ways of adjusting the model, namely, “influence relationship adjustment” and “automatic covariance adjustment” (The SPSSAU project, 2022). Finally, a model result was developed as below until its most indicators met the criteria.

Figure 4-8. SEM diagram with standardised regression coefficients



In the Figure 4-8, five factors or constructs are represented as ovals, and their indicators/measurement items are shown in rectangles. Directional arrowheads show the influencing relationships between two items, the values of which indicate their standardised loading factors. The regression coefficient is greater than 0.6, which essentially shows a good measurement relationship of each factor.

Thus, hypotheses H1, H2 and H3 were supported by the SEM model above, since both factors A' and B' can exert direct influence on “E: The general JS appraisal”.

In addition, factor B' exerts a statistically significant influence on factor A'. Among eight significant indicators of B', social responsibility of PSM is shown the most important elements of factor B', which is accurately bound up with the current research context. Other components of factor B' contain supportive leadership, social responsibility, self-sacrifice, and empathy of PSM theory; as well as individual characteristics as altruism, autonomy, creativity, and decisiveness, linking to JS, which are in line with the past literatures and Chinese personality (QZPS).

For factor A', the two technology affordances of *DingTalk* such as "task quality" and "work pervasiveness" are considered more valuable job resources than other affordances in the public sector in China. The role of *DingTalk* use as a job characteristic resource is confirmed not only directly impacting on overall JS evaluation, but also as the moderating mediator between B' and E.

Contrarily, hypothesis H4 is refuted: both C' and D' do not directly impact on factor E but on factor B' directly and negatively, from the statistical analysis. Moreover, factor D' has a significant and direct influence on factor C', leading to negative consequences because of *DingTalk*'s technology affordances of complexity and incompatibility. In this model, the complexity of *DingTalk* functions is confirmed statistically to distress workers more than the incompatible feature of *DingTalk*, based on the different coefficients: 0.832 and 0.729, respectively.

However, the unsatisfactory feelings or negative affordances of using *DingTalk*, are shown no significant effect on the JS directly and statistically. Instead, they exert influence on JS indirectly through intervening variable of factor B'.

Table 4-12 below shows  $\chi^2/df < 3$ , RMSEA  $< 0.1$ , CFI  $> 0.9$ , NFI  $> 0.9$ , and NNFI  $> 0.9$ , which indicates a good fit of SEM in the quantitative phase and the model is reliable.

Table 4-12. Model fit index of SEM

<b>Commonly Used Indicators</b>	$\chi^2$	<i>df</i>	<i>p</i>	$\chi^2/df$	GFI	RMSEA	RMR	CFI	NFI	NNFI
<b>criteria</b>	-	-	>0.05	<3	>0.9	<0.10	<0.05	>0.9	>0.9	>0.9
value	484.711	164	0.000	<b>2.956</b>	0.857	<b>0.082</b>	0.114	<b>0.933</b>	<b>0.902</b>	<b>0.922</b>
<b>Other Indicators</b>	TLI	AGFI	IFI	PGFI	PNFI	SRMR	RMSEA 90% CI			
Criteria	>0.9	>0.9	>0.9	>0.9	>0.9	<0.1	-			
value	0.922	0.817	0.933	0.669	0.779	0.07	0.074 ~ 0.090			

Default Model:  $\chi^2(171) = 4948.542, p=1.000$

Therefore, the SEM diagram not only imposes the hypothesized structural relationships among five constructs, but also the significant values of these factors and measurement indicators in the influencing relationships. The SEM analysis provides the basis of the overall theoretical framework, and a detailed discussion and conclusion will be presented in the next chapter.

#### 4.3.4 Data Analysis of Open-ended Questions

There are two open-ended questions in the research instrument. One is “What improvement (including design and use) do you think should be made for *DingTalk* to increase your job satisfaction?”, and the other is “Do you have any other suggestions for using ESM tool during work?”. Consequently, 155 textual suggestions were proposed by respondents to the former; for the latter, 75 effective answers were obtained.

The raw data of answers were coded into categories through identifying keywords of similar meaning manually; then, frequency analysis was applied to the repeated categories. In this way, the qualitative data can be displayed by quantitative diagram. For the first open question, the textual 155 answers were coded into nine categories (Figure 4-9), and the category title of each group is identified from key words of main contents by the researcher manually. Thus, the data frequency of textual clusters is illustrated below.

Figure 4-9. Answers to “What improvement for *DingTalk* can increase JS”

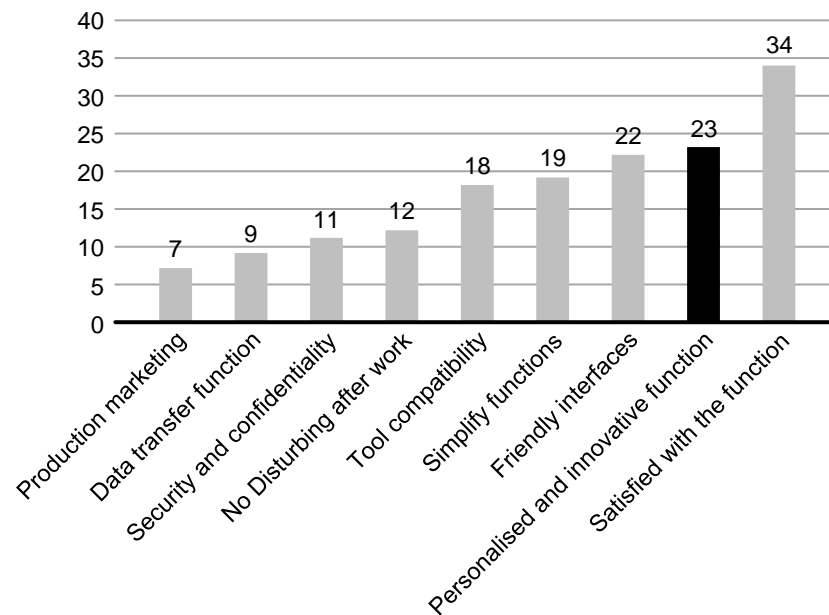
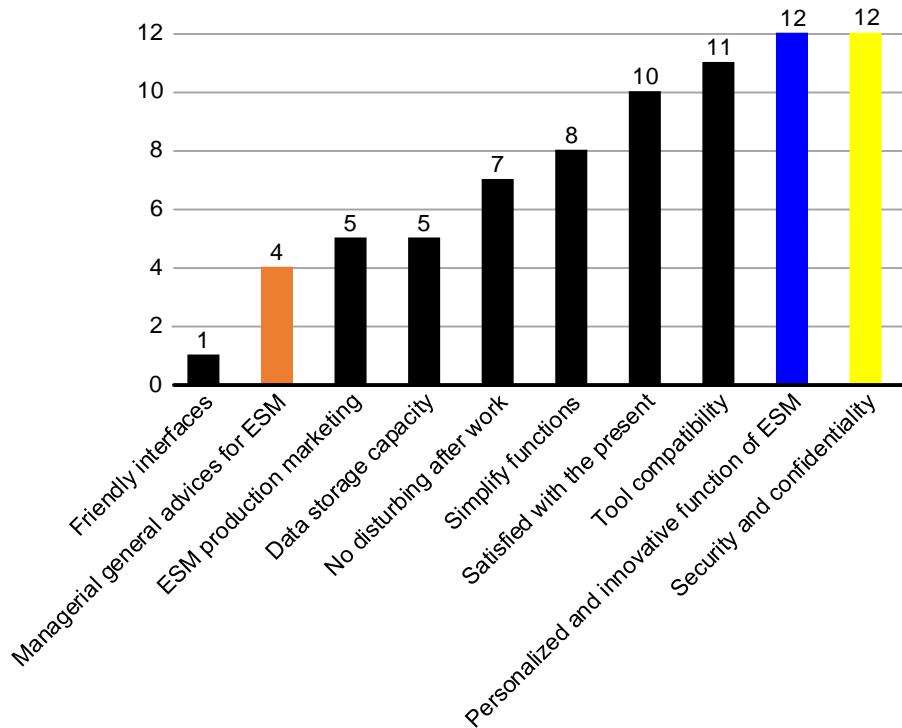


Figure 4-9 illustrates that among the 155 responses, 34 employees were satisfied with *DingTalk* and mainly offered no suggestions to improve *DingTalk* usage. On the rest of the suggestions, 23 employees requested for “personalised and innovative function of *DingTalk* usage”, which was the most common suggestion. In this category, for example, one user proposed adding the function of funky emojis to the serious work socialising tool; conversely, another suggested that the private chat function should be removed to be more professional. Some users wanted to escalate privileges of design and working procedure, and display more information of using status of co-workers; whereas another user hopes to make one’s own functional choice of the displaying status flexibly by *DingTalk* platform.

From category one to category eight, these opinions all reflect that the users want to make improvement to the design of *DingTalk* platform and shape technological changes. In other words, from the perspective of sociomateriality theory, implementation of *DingTalk* technology is the interplay process of developing individual confidence, autonomy, and creativity, a dynamic process between human and *DingTalk* as well.

Most answers to the second open question in survey were similar, among which 75 answers were identified as effective ones. The data analysis of textual frequency is shown in Figure 4-10.

Figure 4-10. answers to “Improvement suggestions for *ESM* usage”



In Figure 4-10, one new category of “managerial advice for using ESM tool” was added to the categories of open answers. Surprisingly, the suggestion of the highest importance from these participants is “Security and confidentiality of ESM usage”, by inference, which is closely related to the nature of public agencies. It indicates that most Chinese institutions are paying more and more attention to the privacy awareness and information protection in contemporary industry.

These positive feedbacks for ESM applications’ improvement occupied seven categories out of ten (Figure 4-10). This shows that digital platforms can provide a fairly smooth communication channel for employees. Besides, some interviewees were engaged in the autonomy of mastering ESM tools and determining their choices. For instance, the category of “personalised and innovative function of ESM” was the most popular group again, like the previous question. Various answers in the category contain “Increase interactivity”, “Select mode by scenario”, “Develop more

funny memes”, “Anonymous suggestion box to leaders”, “Software model should be more creative”, and “The more personalised applications are, the greater they success”.

Although the number of answers was not large for the category of “Managerial general advices for ESM”, the meaningful perspectives mattered a lot to the research. For instance, in this category, “*using ESM is to connect people closer together rather than increase the divides*”, “*empowering workers and treating them as owners with humanization management*” and “*more intellectual and flexible management are needed*” all focus on more effective management strategies of ESM usage in the organisation. In the current public context of China and taking organisational missions into account, the collaborative working pattern and the interactive relationships among *DingTalk* users should evolve with novel technology development, as well as the product, service, consciousness, and corporate culture. Moreover, one suggestion of “the necessity of enhancing technological training”, emphasised the urgent need from sustainable learning and innovative support of public sector in China.

#### **4.4 Summary**

This chapter discussed the data collected from two strategies sequentially: in-depth interview and online questionnaire. For the qualitative part, thematic analysis was carried out through coding interview data. It is a significant step that “makes meanings” inside the research context and to outside audiences, through finding the differences, commonalities, patterns, and structures in data (Braun and Clarke, 2006; Vaismoradi and Snelgrove, 2019). These codes and themes within a map, helped in the design of the quantitative instrument and in the examination of four relational hypotheses between IVs and DV in semi-structured survey. Through SPSSAU, questionnaire results were processed to meet the criteria of statistical assumptions, including dealing with outliers, reversing scales, and generating new variables. Then the validity and reliability of all measurements were examined through CFA and EFA tests. An ANOVA was used to check whether categorical data could moderate the



relations between various factors and JS. Finally, path analysis and SEM techniques help developed the impacting relationships and significant indicators among constructs with statistical coefficients in proposed framework.

The integrated analysis revealed the strength of mixed approaches in that the interview interpretation can be supported complementarily by sequential statistical results. The significant components of various factors within each hypothesis linked the relational evidences to the qualitative findings for the research questions and extant literatures (Bryman and Burgess, 1994).

The next chapter presents the relevant findings of the *DingTalk* phenomenon in a theoretical framework and specifies the moderating and influencing factors on employees' JS within Chinese contextual situations. Besides, further knowledge contribution to extant literatures, related theories, and managerial implications for OB research will be presented in the following.

## Chapter 5. Conceptual Framework and Knowledge

### Contribution

#### 5.1 Introduction

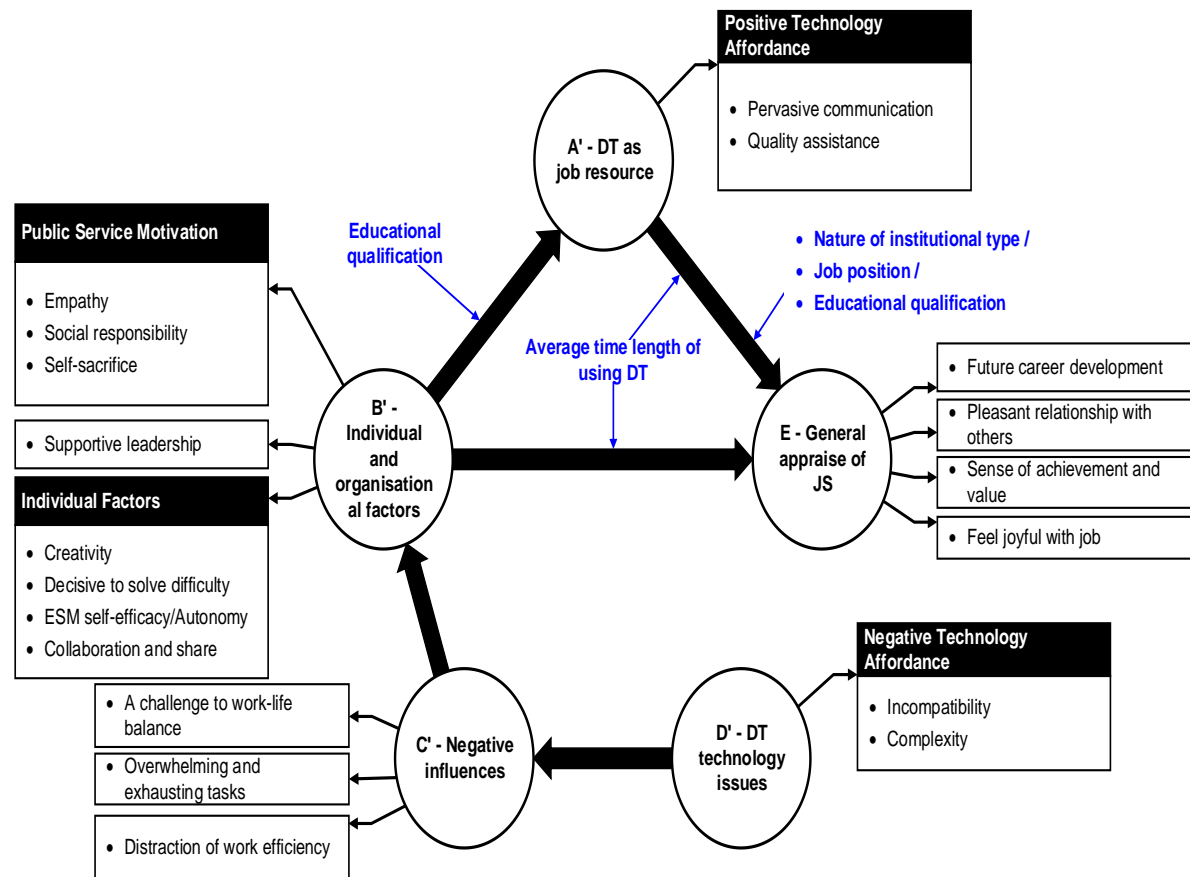
Based on preceding literature reviews, this chapter examines the qualitative and quantitative findings in a synthesis of evaluation for employees' JS. Incorporating data analysis from the pragmatic mixed methods, within the context of public institutions in China, a conceptual framework of the *DingTalk* phenomenon is established based on the sociomateriality theory, JD-R theory, and technology affordance. The aim is to achieve the research objectives by presenting a full picture of four primary constructs and their impacting relationships on the JS of employees. Furthermore, the significant indicators, mediators, and moderators between IVs and DV are identified in the theoretical framework from statistical analysis.

#### 5.2 Experiential Knowledge and Exploratory Research on Conceptual Framework

Based on the literature review and interview results, five important themes were identified and their relationships were developed in a SEM model as IV and DV in Chapter 4. Under each construct, the significant impacting elements in the *DingTalk* phenomenon address the interactive essentials through the relationships among employees' personal characteristics, public organisational context, and their job perceptions, and behaviours during using *DingTalk*.

Based on previous statistical model in Chapter four, Figure 5-1 retains the relationships between the constructs in five circles, the constituent elements towards each construct, and measurements of path coefficients and regression coefficients in Chapter 4 are removed. The four moderators including "educational qualification", "average time length of using *DingTalk*", "nature of institutional type" and "job position" are found their indirect effects on overall JS, that have connections to different paths rather than directly to the variables.

Figure 5-1. Conceptual framework of the study



Based on the relationship in SEM model in Chapter 4, factor A' has been proven in hypothesis H1 (A'→E), and considered as a mediator between B' and E. Hence, variable A' confirms that using *DingTalk* plays a significant and positive role in overall JS assessment of public employees, which conforms with JD-R theory (Schaufeli and Bakker, 2004). Along with literatures there are many positive affordances to ESM users, these technology affordances of *DingTalk* were proven statistically significant as job resources by employees in current study. For example, “pervasive communication” and “quality assistance”, were underlined by participants because under the Chinese context, the omnipresent collaboration and instant communication in routine workflow via *DingTalk* is the most valued. The powerful functionality of *DingTalk*, such as Ding message, *DingTalk* call, group chat, private chat, video meeting and *DingTalk* mail, has already taken off internally in institutions and cooperated with partners outside the public sector.

Compared to the conceptual framework in Chapter 4, current study also supports the hypothesis H2 and H3 (relation from B' to E) directly by qualitative analysis and statistical result of questionnaire in Chapter 4. As a great mass of evidences in existing studies indicated, eight statistically significant components of factor B' were identified into two aspects. Of these, four significant components are found to be supported by previous interview findings, which mentioned a similar effect of PSM on public employees in Indonesia context (Oktosatrio, 2019) and the study of PSM on Hainan civil servants by Ding (2019c) as well. Furthermore, in public institutions in China, "empathy", "social responsibility", "self-sacrifice" of PSM, and "supportive leadership" are regarded as positive indicators of employees achieving better JS in the institutional theory as well (Yu et al., 2020; Wang et al., 2023).

Other four individual characteristics of public employees in Factor B' also are highlighted by *DingTalk* users in six public institutions of our survey. The relevant traits are "personal creativity", "decisive to solve difficulty", "ESM self-efficacy and autonomy" and "collaboration and share", that are partly consistent with the findings of Qin (2021)'s research about Shanghai civil servants and Chinese personality characteristics.

In previous literatures, moderation and mediation are analysed separately as boundary conditions, for instance, samples were categorised into subgroups to examine different levels of research goals based on path-analytic framework (Hayes, 2018). Then moderated or mediated variables were assessed in a sequential procedure; however, a previously significant moderator might no longer show a significant effect after adding a mediator variable into the framework, and vice versa (Edwards and Lambert, 2007). However, in this study, from the perspective of sociomateriality, especially integration of moderation and mediation effects of employee's demographics with various technology affordances could influence one or more paths in the model. Thus, whether a moderator variable exerts the significant direct influence on the paths and constructs, and the mediating effect of *DingTalk* usage are linked to employees' JS together in a framework Figure 5-1.

Statistically, four moderators as “Educational qualification”, “Job position”, “Average time length of using *DingTalk* every day”, and “Nature of institutional type”, were found significant effects on two paths: A'→E and B'→E. In other words, the assessment of JS is a comprehensive and dynamic process, which could be influenced by two variables A' and B', and four flexible moderators together, as in the Figure 5-1.

The public employees in China are generally equipped with educational qualification of bachelor degree and above; this requirement was proven necessary because higher education provide them more learning opportunities in using new technology tool and being agile to enterprise changes with self-efficacy. Moreover, based on data analysis result (Figure 5-1), when “Average time length of using *DingTalk* every day” was used as a moderator to explore the general JS level of different groups of respondents, it was found that the higher job rank, the higher the average JS evaluation, even the longer using time of *DingTalk* during their daily work.

Considering the significant relationship between current job position and the determinants of JS, so the rational tactics for motivating employees' JS within an ESM environment are to be developed.

Different from conceptual models in chapter 2 and 3 previously, the hypothesis H4 (Figure. 4-3) was refuted in Chapter 4 by statistical analysis, so the negative affordances and issues of *DingTalk* were found no direct impact on general appraisal of employees' JS in current study. From the perspective of sociomateriality of ESM, the downsides of *DingTalk*'s technology affordance could lead to the unfavorable responses and reactions to the technology, namely, functional features of incompatibility, complexity, and insecurity of factor D' have direct influence on factor C', which might have effects on factor B'. Thus, technological issues related to *DingTalk* directly lead to other negative consequences, such as work-life conflict, overload of individual tasks, and inefficiency for work. As a result, the negative influences will impose on the way individuals interact with leaders, coworkers, and customers, or their attitude of resistance to working discipline and the environment, even their poor JPs in an uncomfortable organisational climate (Shang et al., 2023;

Si et al., 2023). However, this study found that the counteractive emotions, *DingTalk* experience, and negative perceptions of public employees could not directly determine their JS and in particular, negative influences of technique issues only directly affect individuals with less competency or more stress when participating in urgent work practices.

Overall, integrated with empirical inquiry, the conceptual framework not only demonstrated the progressive value of *DingTalk* technology to contemporary public industry, but also identified the core factors of JS and their relationships in the ESM management mechanism, to improve employees' well-beings. Therefore, partial proposed hypotheses in previous thematic map (Figure. 4-3) were supported significantly through the mediating effect of *DingTalk* use from the perspective of technology affordances. Thus, the theoretical framework of *DingTalk* phenomenon (Figure. 5-1) in the public sector in China is extended from traditional researches in this study, which can be understood from following section.

## **5.3 Contribution to Knowledge**

### **5.3.1 Perspective of Technology Affordances on JS**

Although there are several ESM affordances identified by existing literature, the developed theoretical framework of Figure 5-1 is a new means to understand work-related influencing mechanisms and individual affections through ANT perspective and technology affordances of *DingTalk*. For public agencies in China, this refined model identifies two negative affordances and two positive affordances of *DingTalk* usage in conjunction with public work practices, and provides an investigation into public employees' lived experiences empirically.

Negative technological affordances of *DingTalk* like "complexity" and "incompatibility" are mentioned relatively significantly than "insecurity" among public employees in prior studies, although negative influences of all affordances might lead to unfavourable issues such as information overload, boundary-less job demands, or technology-related hassles for public employees. This finding is partly supported by

Sun et al. (2019) and further explores bilateral influences of ESM affordances emerging within various individuals' behaviours in Chinese working practices, rather than only in the activity of knowledge sharing. From the perspective of *DingTalk* technology affordance, it is important to develop specific learning and training programs to reduce the adverse effects from "complexity" and "incompatibility", and increase employees' capability of ESM-related operation.

Besides, two positive affordances of *DingTalk* from "pervasiveness communication, and quality assistance" were found statistically and directly correlated with general JS appraisal of public employees. According to the socio-material perspective of ANT, public employees could perceive various affordances but they mostly choose to incorporate and implement these two crucial affordances of *DingTalk* within given institutions as their suitable job resources. It is closely related to the nature of their work, no matter within which category of public sector.

Because of the increasing requirement of public institutions, especially the restriction on people's behaviours due to the pandemic, generating ubiquitous connections and collaboration is the workflow of digital era. "Pervasive communication" affordance implies the essential relationship between *DingTalk* and all working practitioners in public sector. It benefits interpersonal conversations and collaborations at any place and any time. Since improving service quality is a priority of these public organisational goals in China and to achieve their mission, *DingTalk* is confirmed that its affordance of "quality assistance" can facilitate knowledge sharing, digitalise work process, and improve efficiency. Thus, these two positive affordances of *DingTalk* were proven vital and directly improve overall JS and JP of employees within public organisations in China.

Therefore, the theoretical lens of technology affordance in this study fills the research gap by empirical investigation on different influences of *DingTalk* usage through positive and negative technical affordances.

Since ESN implementation in organisations interacts with the given context and dynamically influences the result of applied psychology research, these affordances are derived from the social and cultural traits of the public sector in China and enrich

earlier management researches (McFarland and Ployhart, 2015; Bobsin et al., 2019; Mengli, 2021). Thus, this study helps us to reexamine the ESM managerial system of public institutions in China, which should pay more attention to promoting interactive work activities between human and technology. In response to technology advancements from affordance perspective, future research could examine how to better design, develop, and facilitate ESM tools in diverse environments (Shao et al., 2020) and enrich the theory of ESM affordances for a thorough understanding of this *DingTalk* phenomenon.

### **5.3.2 Determinants of JS in the Study**

As discussed in previous literatures, JS is difficult and complex to measure in a general scale since it is easily affected by various variables, such as individual, familial, organisational, social, and cultural factors in the moment of participation or of a long duration (Mullins and Christy, 2016; Jung and Suh, 2019). Thus, this study incorporates a pragmatic mixed methods approach to examine the complex and multifaceted concept of JS of *DingTalk* users in Chinese public sector, through combination of in-depth interviews and an online survey. Although the enquiry into users' attitudes, experiences, and behaviours are mostly conducted in six chosen Chinese state-owned organisations, it facilitates a fundamental understanding of localised measurement of determinants for JS in this thesis.

As in the conceptual framework (Figure 5-1), this study identifies the direct influencing factor B' of JS which contains eight significant determinants; four belong to individual factors and other four are organisational. *DingTalk* usage as a job resource can be regarded as the direct influence on JS, meanwhile it can be considered as a mediator between the entire factor B' and overall JS evaluation. Additionally, other moderating conditions are necessary to interpretating *DingTalk* phenomenon, including demographic information of individuals such as job position, educational background, institutional type, and using time length of *DingTalk* daily.



More specifically, the four determinants of organisational aspect are empathy, social responsibility, self-sacrifice of PSM, and the supportive leadership. From the result of interviews and questionnaire, this research confirms that a high level of PSM is associated with higher JS of public employees, which is partly accord with the study of Ding (2019c) and Hong et al. (2023). Because the PSM is considered a stable, altruistic, and internal dynamics rather than external stimulus, it is gradually becoming the universal requirement of talent recruitment, selection, training, and assessment in ESM environment for the public sector in China.

The four personal characteristics are proven positively and directly linked to JS in this study are creativity, decisiveness, ESM self-efficacy/ autonomy, and collaborative spirit. As the participation of public employees is a strength of this survey, their personal traits and characteristics are vital to explain whether they can handle working changes in public institutions with ease through their technical experiences of using *DingTalk*.

Consequently, the hypotheses and analysis from quantitative survey helped explain the statistical supplement to research questions, that what and how are the specific indicators of IVs significantly impacting on employees' JS in the study. The theoretical findings about the *DingTalk* phenomenon not only confirm that the interactive components of individuals, ESM technique, and organisational environment are mutually reinforcing well-beings in Chinese context, but also jointly enable the consideration that the role of utilising *DingTalk* technology can optimise JS evaluation in OB research directly.

#### **5.4 Summary**

Overall, conceptual framework of the thesis extends knowledge of technology affordance from empirical evidences of the study, based on relevant ANT and JD-R theory. Besides, it highlights the significant role of *DingTalk* use in the public sector in China, and identifies the mediating role of *DingTalk* usage from empirical survey. Furthermore, the essential determinants and moderating effect of several factors of employees' JS in the model are examined in the conceptual framework and that

findings extend past relative literatures, answering previous research questions as well.

In the next chapter, the study provides relevant discussions for personal characteristics and perceptions of public employees, and some managerial implications for public institutions in China under the *DingTalk* phenomenon.

## **Chapter 6. Conclusions and Recommendations**

### **6.1 Introduction**

The previous chapter discussed a conceptual framework emerged from the *DingTalk* phenomenon and its contribution to extant knowledge in OB research. This chapter aims to explore different perspectives towards the *DingTalk* phenomenon and provide practical ESM implications within public institutions in China.

Changes in ESM technology cause disruptive changes and constant adaptations in organisational relationships and social interactions in public institutions (Ardi and Putri, 2020). Taking the strengths of the *DingTalk* platform, different stakeholders such as technique professionals, leaders, and general employees in public sector all need to update their concepts and improve their services practically, to maintain a great job performance and sustainable prospect in future work. Consequently, given the transforming challenges in individuals' emotions, attitudes, and strategic interpersonal relationships in organisations, and integrating with developing corporate culture in China, some crucial recommendations are outlined for different stakeholders to improve ESM tool deployment and design appropriately. At the end, besides the reflections from my perspective, the limitations and futural research of this study are reflected.

### **6.2 Managerial Recommendations for Different Participants**

#### **6.2.1 Self-management Technology for Individuals by Sociomateriality Theory**

From an ANT theory perspective, a social network is driven by the underlying power structure which comprises dynamic collaborative components within the organisation and process (Muhammad and Wickramasinghe, 2018). For public employees in China, the sociotechnical relationship between humans and *DingTalk* technological affordances is found also reciprocal.

The notion of power structure in organisational studies and understanding of discipline mechanism or the care of self (Foucault, 1977; 1997b) within different

contexts need to be updated. Unlike traditional power (the direct supervising of, and controlling of, employees), the technical control of a tool can both reshape the relations of employee and employer, and the subjectivity of workers of how they define themselves through contemporary surveillance (Sewell, 1998). In contemporary society, humans can influence the usage and design of ESM tools, otherwise the functions and affordances of a technology could generate impacts on humans from the sociomateriality theory (Booth et al., 2016).

Previous findings confirmed the significance of influencing variable B' on JS appraisal of employees, and it contains two aspects: personal characteristics of individuals and organisational factors. Therein, the personal characteristics related to *DingTalk* usage make up half of eight important components in this research.

From the individual aspect, this study offered empirical evidence that, supported by technology affordances of *DingTalk* positively, most public employees can take advantage of the tool as a good job resource that facilitates better services to customers and achieve better evaluations for their jobs and organisations.

Additionally, Chinese personality traits, such as altruism, decisiveness, autonomy, and creativity, are valued as the most significant traits for public employees in China (Yin, 2016a; Iuliiia, 2018). Furthermore, personal identity of public employee can be constructed and reinforced by interpersonal feedback and peer acceptance from the public sector in China. For instance, in the modified model study of Kwon and Wen (2010), individuals with high social identity were highly to achieve better usage of ESM under the encouraging circumstance; because they are likely more active and engaged with online interactions and knowledge contributions.

Likewise, high ESM self-efficacy and autonomy are also considered great personal traits for workers who use an ESM tool and achieve better JP and career development (Manroop et al., 2021). Based on SM self-efficacy theory (Hocevar et al., 2014), individuals with high SM self-efficacy are found to be more confident and engaged with others, which lead to professional skills in seeking information and sharing knowledge. For instance, when users actively participate in using, modifying, and designing personalised functions of *DingTalk* application, the negative emotions

towards the tool could be changed. Rather than passively accepting tasks from superiors by *DingTalk*, they would be motivated intrinsically by learning and training initiatives; thus, they can craft their own job content, tailor work schedule, and engage in activities through using *DingTalk*.

For example, the most constructive suggestions from the findings of open-ended questions in survey and interviews, were grouped as the category of “personalised and innovative function of ESM usage”. In the survey, some respondents expected that in the future they could develop personalised applications like “building blocks” on ESM platforms innovatively in the survey. Personalised applications would enable them to achieve both individual and organisational objectives, as well as a good level of JS, and completing more challenging tasks with less available time.

However, negative technology affordances of *DingTalk*, such as tech-overload, tech-invasion, and tech-inefficiency, might have indirect impacts on individuals’ negative feelings. Thus, the massive workload, speed-up of workflow management, and dataveillance in the system by *DingTalk*, is still sometimes seen to negatively reduce individuals’ autonomy (Trusson et al., 2018; Wang et al., 2020). For example, *DingTalk* users are required to be constantly connected to the tool, always online, and respond to some requests quickly. Especially if real time information, feedback, and assessment of employees are incorporated into the entire work-flow, then, public workers will perceive negative issues with the technology, and will reluctantly comply with organisational expectations (Kellogg et al., 2020). Consequently, some workers might adopt resistance tactics such as non-cooperation with tasks, logging off the platform frequently, bad feedback ratings, and collective strikes against their leaders. However, the survey data and interviews found relatively less evidences happening in this study, except a few complaints and fatigue. Most respondents were found agile to institutional development and evolved with their working environment, taking advantages of *DingTalk* technology as job resource.

Starkey and Hatchuel (2002) mentioned that the technologies of self allow individuals to create new modes of being, have a vision of the future, and liberate themselves from the negative aspects of organisational management. The challenges brought by

technological issues will be modulated; meanwhile, resistance, dissatisfaction, or turnover will be transformed to cooperative goals and conducive decisions in dynamic power relationships.

On one hand, public employees in China have an education background of bachelor degree or above and passed the national civil service exam mostly. In a sense, they are a group of people selected with certain competencies and similar moral identities. Even most of them have annual trainings of professional capability and routine work checks daily for their organisational commitment via *DingTalk*, such as in public hospitals and Tax bureau. These educational qualifications and trainings largely ensure individuals' work-related competencies, such as their learning skills, technical expertise, decisiveness to solve problems, being cooperative with others, and their public service motives.

On the other hand, from the aspect of public state organisations, PSM was proven significant for employees; this contains components of four theories: social cognitive theory, SDT, predisposition-opportunity theory, and goal-setting theory (Perry and Hondeghem, 2008). The four theories reflect that driven by internal technologies of the self, individuals could become self-aware, self-determined, goal-oriented, and decisive. According to cognitive appraisal theory, self-management technology is the most significant competency at the physiological and behavioural level for public employees. Since different goals and ability of individuals will lead to various emotional reactions when under an assimilated situation, action aligned with an individual's goals can evoke positive emotional responses, whereas inconsistency evokes negative consequences (Carver and Harmon-Jones, 2009). Likewise, Wang et al. (2020) suggested that goal-oriented individuals with a positive attitude towards electronic equipment monitoring and strong time management skills might have stronger organisational commitment and JP.

Perceptions of diversity need to be respected in the study; thus, a balance between passive obedience and active participation of individuals needs to be struck when using *DingTalk* in public institutions. To encourage employees to adapt to ESM technology, more technical support and necessary guidance from institutions will

benefit the forming technology of the self of employees in the age. To bridge the gap between individual agency, one' JS, and evolving public institutions, it is vital that employees should master self-managed agencies in the transformation process of accelerating technology; thus, individuals will be able to respond to work practices innovatively and behave in a more accommodating manner (Raffnsøe et al., 2019; Guo, 2023).

The finding of this study adds empirical evidences of *DingTalk* phenomenon to the theory of sociomateriality in which humans and ESM technology are allied and reciprocal through employees viewing the use of IT as integral to their sense of self (Carter and Grover, 2015, p.931; Pitafi et al., 2023), growing technology of the self, and evolving within the technical situations. Moreover, the relationship between specific technology affordances of *DingTalk* usage and four significant characteristics of public users are identified in a holistic picture of current study.

### **6.2.2 Supportive Leadership and Novel Managerial Mechanism for Initiators**

In public sector in China, initiators of *DingTalk* use are usually senior managers, leaders, technique professionals and entrepreneurs. No matter interviews, or statistical results in Chapter 4 found that the higher the job rank in the organisation, the higher the satisfaction, even if they spend more time using *DingTalk* than the general staff. For the group of senior managers, a duration of *DingTalk* usage of 4-6 hours was associated with the highest satisfaction. The interviews also found that managers were not just passive receivers of tasks when using *DingTalk*, but active in their work performance and shaping new boundaries of work and life. Their intentions to maintain a long-term relationship with organisations through cooperative interaction are stronger than general staff's.

This study provides evidence that the moderating factors of educational background, personality, job rank, and duration of daily using *DingTalk* all impact more significantly on employees' JS in this context; yet age and gender do not. As stated previously, some public leaders in this study said that they felt more accomplishment

in completing a large workload with the assistance of *DingTalk* than negative emotions. This is due to their self-enhancement motives and their capability to use *DingTalk* efficiently as a job resource. They can communicate with relevant parties anytime, get quick responses, and cope with challenging issues via *DingTalk*, then continually make assertive decisions. Accordingly, they could be committed to solving problems resourcefully, transforming the workload into motivation, achieving prospective goals, and enhancing happiness at work (Dai et al., 2021).

Career development theory (Super and Knasel, 1981) proposes that most employees need a process of “career adaptability” to balance between passive work pressure and their active engagement in a dynamic environment. Frequently, competences and attitudes are assessed as higher for senior workers, professionals, or managers than general staff when confronting with novel, challenging problems during the technological changes (Ulrich and Beatty, 2001). In public institutions in China, although some senior ESM adopters are said to be less willing to use the digital medium application for communication than their younger counterparts, the statistical results did not support the view that age differences were the direct cause for this. Another cause could be that some senior employees do not regard their current job as a top priority as they are mostly in the maintenance or stable stage of their career (Lu and Gursoy, 2016).

So, in contemporary industry, the leadership and role of leaders should continue to evolve in new way (Ulrich and Beatty, 2001). Along with the release of advanced versions of ESM applications, new learning cycles that come up again and again might lead managers to perceive more pressure from job complexity and increasingly learning demands than before. Although managers might be offered more benefits by ESM for leadership emergence, teambuilding, and culture facilitation (McFarland and Ployhart, 2015; Wang et al., 2023), improving JS and the loyalty of employees from customised incentive strategies and supportive leadership are necessary (Dai et al., 2021; Liu et al., 2023). Through the moderating effect of supervisor-subordinate instrumental and expressive ties on ESM, radical innovations can be motivated from managerial mechanism of employees (Zhang et al., 2023).



Firstly, considering different career stage that explains employees' different attitudes and behaviours to overwhelming tasks is vital for managerial mechanism. Over 80% of employees in this survey are Generation Y or Millennials, compared with their predecessors, some Generation Yers reckon that work value outweighs their personal life and leisure, maybe because of their senior job identities in the development stage of career; while some Generation Yers place much more emphasis on work-life balance and leisure. Due to relative lower autonomy and capacity, some users feel more overloaded than others (Saunders et al., 2017). To avoid work-life conflict for *DingTalk* users, leaders need to clarify the boundaries of tasks, respect employees' emotional needs, and actively listen to their requirements to improve well-beings of subordinates.

For some junior workers, they are not willing to tolerate emotional depletion from their jobs at the trial stage of their career. If job dissatisfaction or job burnout occurs in their current organisation, junior workers are inclined to choose turnover and search for a new job. Relatedly, to motivate junior workers, managers can disseminate corporate responsibility to them via *DingTalk*, offer them learning opportunities, and actively facilitate job security by high-moral teambuilding. Only when jobholders gain more knowledge by sharing and training on the platform, will they feel more intelligent, engaged, and autonomy.

Moreover, regardless of career adaptability or job identity, supportive leadership is needed to assist IT capability of individuals by *DingTalk* platform usage, such as sharing information, cooperation, new job resources and developing visionary goals for subordinates. In this way, new patterns of group interactions and collaboration via *DingTalk* will be organised instead of traditional ways; thus, general staffs can gain a sense of security and belongings from their supervisors' management. Furthermore, some informants in this survey claimed that partnership should move from a superior-subordinate relational orientation to multilayered interactions of sharing and communicative channels. For instance, fluid relationships among workers and various leadership teams form within a large institution when the organisational structure becomes flat via the *DingTalk* platform (Oldham and Hackman, 2010).

Therefore, supportive leadership behaviours are more likely to evolve based on the “dynamic duality” of a resilient management theory, rather than on a simple “dichotomy”, especially in a contemporary ESM context. Leaders need to grasp more on their subordinates’ concerns, progress, demands, and performances through communication and teambuilding on the application; this is a dynamic process and a positive way to increase the JS of both sides (Dai et al., 2021).

Mo and Yu (2017) revealed that ineffective communication and challenging demands between subordinates and managers can be transformed into positive relationships by *DingTalk*, and a positive work environment leads to more satisfactory organisational outcomes. *DingTalk* practitioners and leaders in the current study need to shift to a new business model and use the platform efficiently with responsiveness, innovation, and solutions. Their generous behaviours and supportive leadership aligned with organisational beliefs and values are indispensable to moderate the moral efficacy of employees and encourage good behaviours of social groups (Ardi and Putri, 2020; Ma et al., 2022).

### **6.2.3 Constructive Implementation of ESM Technology for Public Institutions**

For the past century, governance in contemporary institutions has changed a lot. Contemporary normative and rational control of people, of both their soul and body, operates in a more isolated and covert way than managers’ traditional use of power and discipline in the workplace (Barley and Kunda, 1992). Foucault (1977) proposed that power exerts its ubiquitous influence in shaping “docile bodies” during the labour process. However, the traditional implementation of power and discipline has gradually become a new form of knowledge-governance and technological surveillance (WithDefiance, 2013). For example, over the past decades, assembly lines, automation products, and computer terminal recording, could all be regarded as instruments of maintaining the observation and control over people, in terms of “microphysics” of power (Turner and Lawrence, 1965; Szokolczai et al., 1993). Moreover, with the development of innovative techniques in recent decades, up-to-

date digital applications, such as ESM tools, are a substitute for human examination of employees' work activities in the modern social world, through three control mechanisms: direction, evaluation, and disciplines (Kellogg et al., 2020).

In contrast to the past bureaucratic control of rules, procedures, or subjective judgements to guide and supervise employee's behaviours, new technologies like ESM are more comprehensive, instantaneous, interactive, and opaque than past technological systems in the workplace (Kellogg et al., 2020; Bai and Yan, 2023). For instance, the real-time sign-in system of *DingTalk* can record the time clock of employees' punch in and out, and even their accurate GPS locations if it is required by leaders. Through the *DingTalk* platform, employers or institutions are using it to restrict workers and specifically direct them what tasks to be performed, in what order and time length, even with what degree of accuracy. For instance, one respondent claimed that it was frustrating to be often connected during urgent situations, when some tasks were pushed by "Ding". The warnings urged them to respond and feedback rapidly even at night or on a weekend. Thus, they feel always controlled by the digital application without off-work time.

Furthermore, text data, video conferences, and emails on an ESM platform can be monitored in real time and digitally stored to assess employees' mood, behaviour, and productivity. Along with overwhelming tasks on *DingTalk*, some interviewees considered that mass data surveillance deprived them of personal privacy, constrained their personal behaviour, and reduced their autonomy. Sometimes, *DingTalk* is even used to evaluate public employees' JPs and recommend the rankings of their bonus by annual statistics of attendance. From the perspective of discipline, the punishment and rewarding mechanism can be digitally recorded and calculated by algorithmic technology on ESM platform in the labor process dynamically. On the one hand, *DingTalk* prompts an efficient and flexible process of management in a broader context, and achieves the objectives of organisations; on the other hand, an over-reliance on technology means more physical and mental constraints, such as improper surveillance on employees' daily lives and work inhibition (Trusson et al., 2018; Shang et al., 2023).

Essentially, the working rules, tasks and routines embedded in the *DingTalk* application are implemented based on the interests of a powerful party, which can have access to more resources and privileges in overall system through algorithmic design and data recording. Since *DingTalk* use is mentioned to extend control beyond working hours in this study, public institutions in China need to eliminate the negative impacts and expand positive influences on employees, through building new boundaries of work and life, delivering resilient control and collective well-beings to employees.

Hence, only when the whole organisational climate is characterised by a more open and flexible culture, could employees accept finite monitoring and control as legitimate and procedurally fair, from the perspective of human-friendly management. For instance, if employees feel recognised or supported by each other by online interactions, and meantime online interactions are fair, their attitudes towards ESM will become more sharing, cooperative, and engaged.

Based on social contagion theory (Barsade and Gibson, 2002), individual's behaviours, attitudes, and emotions could be "infectious" and collective within a work group, especially under the communication of SM networks. In turn, the prevalence of ESM makes crowd behaviour and group interactions spread more quickly and on a larger scale (McFarland and Ployhart, 2015). In other words, the pervasive communication affordances of *DingTalk* context will shape individuals' cognition, affect and behaviours as a helpful job resource in the working process. This viewpoint is supported by this survey too. For example, some employees claimed that the *DingTalk* system offers individuals much equity because their working communications are used to be kept and evaluated based on digital records, which is transparent, much more procedurally fair, less biased, and more comprehensive than the subjective judgement of managers. This finding can be found consistent with that of Ravid et al. (2020).

In this sense, PSM is said to engage employees with moral autonomy and self-writing, shifting them from being monitored reluctantly to perceiving accomplishment, self-confidence, and organisational commitment (Oktosatrio, 2019); this process of

transition is consistent with the research of Foucault (1997a) and Carter et al. (2002). Similarly, PSM was found the significant enablers of reinforcing relations and influencing JS of public employees in China (Hong et al., 2023). Additionally, based on public responsibility and institutional mission, the corporate culture in public sector focuses more on empathy, generosity, self-sacrifice, and commitment to community, altruism in relation to cooperation, for human well-being (Zhang et al., 2022). Thus, that also explained that why even 4-6 hours' daily work on *DingTalk* in a routine job was acceptable for some managers. Moreover, in the current study, some interviewees in the information department of public hospitals even claimed overtime work as a routine workflow and contemporary culture. It is argued that ESM-aided learning, training, and institutional culture could help facilitate the corporate social responsibility and cultivate employees' ethical behaviours (Xie et al., 2018; Ma et al., 2022). Therefore, although using ESM after-hours was supposed to have different levels of negative effect on individuals, corporate culture and context are found moderating conditions for individual preference in relation to work and JS. Beyond the research of Bhardwaj et al. (2020), ESM technology is proved as an appropriate way and even the mediator between staffs and their JS for modern organisations, meanwhile corporate culture and institutional management as moderator in current study.

In the current study, state-owned organisations like China Media Group, China Telcom, and China FAW Group, stated that real-time efficiency and innovative production are their corporate pursuit, while state banks and public hospitals indicated that integrity, dedication, and reliability are their institutional philosophy. Compared to Western organisations, most Chinese state-owned organisations like public hospitals, Tax bureau, and state banks, do not reckon efficiency as the single criterion in a job, but emphasise serving the public and delivering social responsibility as a top priority. Therefore, *DingTalk* usage are specified into various affordances by different job characteristics and corporate cultures through assessments, knowledge-learning, and training practices on the platform. However, no matter the differences of various institutions in the public sector, they all need to transfer corporate social

responsibility into an internal cognitive mechanism as a priority, facilitate organisational policies in their moral behaviours, and build fundamental connections among people over SM networks (Chen and Yan, 2020).

In summary, three significant determinants such as self-management of individuals, supportive leadership, and a powerful mission-oriented corporate culture are found their crucial roles in improving the JS of *DingTalk* users in public sector. Hence, *DingTalk* usage is proven could not only enhance employees' identity, engagement, and JS by strategical working practices, but also leverage the aligning of values and culture with widespread network, leading to effective performance and positive results in governmental organisations (Rainey and Steinbauer, 1999; McFarland and Ployhart, 2015; Iuliia, 2018; Mo and Yu, 2017).

### **6.3 Reflection on ESM-related Deployment**

Practically, the pace of IT development is much faster than management academic research, and the practical guidelines of ESM applications should be still evolving. Exploration of the *DingTalk* phenomenon can open up futural formative relations between who we are being and how we interplay with technology, with thoughtfulness and tact (Van Manen, 2016; Wang et al., 2020). Essentially, *DingTalk* technology usage changes the design of task flow, interpersonal relationships, and OBs, subsequently shaping corporate culture and individual outcomes. The empirical evidence of this study indicates that managerial strategies and technical guidelines should be improved along with the significant impact of *DingTalk* usage and its affordance influences in the public sector. Hence, from my own experience and stance, there are some recommendations for better ESM use and design.

#### **6.3.1 Managerial Strategies of ESM Use**

An organisational management strategy is linked to its business goals, vision, and objectives when using an ESM tool (Looy, 2016). In this study, the public sector in China adopted *DingTalk* to realize better service, efficient internal working procedure and system, training and educating people, instead of only making business profit

and technology innovation. Based on the institutional type and organisational missions mentioned, the strategies of ESM usage can be developed and moderated correspondingly.

Utilizing ESM platforms, the routine workflow, contacting activities, and any work-related behaviours of employees within and outside the institution were recorded in a database of the application. The ESM use cannot only help managers and leaders in decision making, but also determine managerial strategies for public institutions, specifically in an age of technological transformation. For example, according to previous interviews from representative respondents, the relevant managerial tactics of *DingTalk* use can be summarised as in Table 6-1.

Table 6-1. Examples of six chosen public institutions and their *DingTalk* use strategy

Public Sector	Example of First category	Example of Second Category	Example of Third Category
Institution type	Tax bureau	Media group, public hospitals, state banks	China FAW Group, China Telecom
Main business goals of institutions	1) Social responsibility of better services and working efficiency	1) Social responsibility of service the public, 2) Delivering social and corporate values of dedication 3) Technological innovations	1) Social responsibility of serving customers 2) Technological innovation 3) Increase profit and sales
ESM use strategies	<ul style="list-style-type: none"> <li>■ Improve efficient work routines;</li> <li>■ Support teamwork and collaborative activities;</li> </ul>	<ul style="list-style-type: none"> <li>■ Support multiple cooperations;</li> <li>■ Create social service through publicity;</li> <li>■ Learning and trainings by multimedia technology</li> </ul>	<ul style="list-style-type: none"> <li>■ Support multiple cooperations; Talent e-recruitment;</li> <li>■ Increase corporate image building and sales;</li> <li>■ Learning and trainings of intelligence technology</li> </ul>

From the Table 6-1, if Tax bureau primarily intends to accomplish better public services and working efficiency, it needs to strengthen employees' social responsibility with concrete ESM tactics. As in our survey, the technology affordances of "quality assistance" and "pervasive communication" of *DingTalk* can be most helpful to increase satisfactions of customers and employees. The relational data analytics of the technology is taken as evidence-based guidance, to engage outside stakeholders by simplifying the workflow on *DingTalk*. Otherwise, internal communicative function such as "employee care" and "punch in" is necessary.

In second category of public sector, institutional missions of the Media group, public hospitals and state banks might be realised from mainly three aspects: (1) providing good social service, (2) delivering mainstream cultural values to public, and (3) launching programmes of innovative products. Hence, technology affordances of “quality assistance” and “pervasive communication” of *DingTalk* will be better implemented in different strategies. For instance, more activities of knowledge and information sharing should be encouraged in the platform to enhance “social association” and “information learning” to external stakeholders. Besides, the “study” function on *DingTalk* platform can help more employees to learn, train, and improve their working capability in various workshops, then develop their interest and confidence for work innovations.

Otherwise, the China FAW Group and China Telecom of third category in public sector are to achieve three primary enterprise goals as in Table 6-1. With analytical benefits from “quality assistance” and “pervasive communication” of *DingTalk*, three aspects of ESM strategies should be better arranged. For instance, one technological leader in China Telecom argued that the structure of the team on the *DingTalk* platform need to cooperate flexibly with different projects and diverse partners, on account of members’ demographical and relational diversity. Hence, the managerial tactics of *DingTalk* use should link with various phased goals in business such as “enterprise dictionary” and “social association”. Besides, some outward ESM initiatives are linked to gaining more resources and making more profit by building and sharing brand awareness such as “live sale” and “talent e-recruitment”. Internally, offering training on intelligent technologies and new concepts are to be leveraged, such as “marketing” and “information learning”.

Furthermore, researchers proposed different ESM tools and corresponding initiatives to monitor and collect relevant organisational information (Looy, 2016). For example, Leonardi and Contractor (2018) proposed that group *modularity* can be used to describe the ratio of internal to external communication patterns among employees. The degree of *modularity* is measured through tracking and mining the digital records from ESM tools. If it is high, efficient teamwork can be achieved by structural



signature of high internal density plus low external range; if it is low, probably an innovative team rather than a tight-knit team is produced through low internal similarity and well-connected external contacts. With *modularity* indicator collecting data on ESM platform, internal and external relations and working teams of employee changes dynamically. Especially during the pandemic in past three years, this kind of sand dune teamwork with unfixed composition and boundaries is well suited to fast-changing environments and can achieve the highest performance for a large organisational establishment (Oldham and Hackman, 2010). Thus, public organisations should improve the strategical management and raise moral level of enterprise when adopting an ESM tool, such as evaluating employees by the level of team diversity instead of individuals in the future.

Additionally, in line with previous research, *DingTalk* application might also be conditioned moderately by individual factors such as one's educational background and job grades, as well as average duration of using *DingTalk*. For instance, a manager could set feasible goals based on the career stage of employee by the platform and guide him along the task process via *DingTalk*, then encourage, recognise, and broadcast one's contributions by the strengths of technology. Hence, whether an individual's knowledge, working experience, and learning capability meet the requirements of new tasks and institutional goals will influence how they leverage the *DingTalk* tool as a job resource or a job demand; the result affects their JS appraisal as well. For instance, in the study the *DingTalk* use of 4-6 hours every day is acceptable for most senior managers and professionals; however, most general staff think the duration of 1-3 hours on *DingTalk* is already enough for work. From the dynamic perspective of ESM affordance, the management of *DingTalk* use should be adjusted with employees of different abilities, intentions, job positions, and the working tasks within the institutional context.

Ultimately, taking *DingTalk* as one example, advanced ESM technology is found a kind of job resource than job demand in this study, so optimised management strategies need to connect people closer with technological affordances. Meanwhile, collective corporate culture and public service also keep changing to realise better JS

for the entire public sector. As respondents suggested in the survey, various designs and novel functions of *DingTalk* are anticipated in the future, no matter from interfaces, modes, complexity, compatibility, or its data transfer, and product marketing.

### **6.3.2 Technical Suggestions for ESM Design**

From the perspective of sociology or anthropology, the progress of human society lies in the increase of communication media and improvement of management mechanisms. New digital exchanges and work activities on the SM internet can reflect a kind of active interactions; meanwhile, digital facilitators will bring economic values to relationships, groups, and organisations, and continuous evolution to humankind and society (Hofacker and Belanche, 2016). Thus, the design of ESM technology is to link human agency with human, establishment, and all work practices.

According to empirical suggestions to open questions from the survey, the context of public institutions in China cannot be ignored. Compared to a traditional organisational environment, the interactions in public agencies between humans and technology in *DingTalk* context have been profoundly transformed. Delivering the social responsibility of public servicing better, and advanced corporate cultures with Chinese characteristics, and leading technological innovation for industry, need further exploration to public institutions by ESM designers.

Firstly, according to our findings, the standardised procedures and routine tasks on the platform need to concede more autonomy, personalised functions, and technological affordances to employees themselves. Some respondents suggested “Select mode by scenario”, “Develop more funny memes”, “More creative model”, “Increase interactivity”, and “Extend more social circle of co-workers”, that they preferred to meet their requirements in designing the *DingTalk* tool. Furthermore, their answers reflected an active desire for more interactive and social associations through “communication affordance” of *DingTalk* platform, even for institutions like

public hospital. Additionally, more innovative designs of *DingTalk* would better fit the specific organisational context in Tax bureau and afford good services collectively, such as developing autonomous rights to *DingTalk* users with another affordance. Thus, developing the tool fit for different institutional cultures and values, which integrates organisational goals with employee's various working practices in variety of technology affordances, will request more collaborations and mutual excitation of *DingTalk* users and designers (Qinnan et al., 2022). Besides convenient performance, user-friendly interface and smooth function of the product, better user experience is the core of realising high-satisfaction service work on the platform in the public sector.

Secondly, tool compatibility and technology security are both mentioned in this study as the critical needs of public employees, which may produce the negative affordances in past literatures. Besides, public hospitals, Tax bureau, or state banks, and China telecom in current study have an internal network system parallel to *DingTalk*, and sometimes employees feel tired of repeated operations daily because of incompatible interfaces in *DingTalk* workflow. As this affordance of the platform negatively influence work seamlessly interfacing with other applications, one informant in the interview expected an improvement in the interoperability and compatibility of *DingTalk*. Therefore, In the future, a designed balance for *DingTalk* needs to be developed which not only considers adequate programming interfaces easily connected to external systems, but also the data security in public sector robustly, even in the Internet of things society. Namely, different positive affordances of ESM should be better integrated into the platform to digitally enable operation convenience of public institutions, no matter for the first, second, or third category of public sector. Meanwhile, minimising the risks of use issues and keeping information security, personal privacy is also critical for the tool design.

Thirdly, since perception of job demands might be influenced by the application design, the work flow design, relational interactions, and cross-organisational collaborative mechanism; appropriate guidelines for designing ESM with least unsatisfactory need to be developed in various organisations. From the lens of

technology affordance, this study finds functional complexity and multiple-system incompatibility as significantly negative influences. Although this study points out that the link between impact of negative *DingTalk* affordances and JS of employees was not directly significant, it is a type of unhappy job demand or stressful emotion for some workers. Thus, building on JD-R theory, technical assistances with complex functions, knowledge training and interpersonal support are suggested to enhance positive effects and mitigate the negative job demands from ESM affordances (Wang et al., 2020). In addition, the frequency and duration of *DingTalk* interruptions after hours should be limited, or boundary for work-life balance should be built for specific institutions (Bobsin et al., 2019). Hence, different guidelines of ESM solutions with “using time” affordances are to be constructed by considering institutional tasks. For instance, a maximum of 3 hours’ work per day on *DingTalk* platform might be tolerated in hospitals and Media Group because they are too busy in daily work to accept the duration time, whereas in China FAW group, the maximum tolerated time might be set at six hours, including knowledge learning and training, to meet the needs of products innovation and marketing achievement.

In summary, the ESM usage and design is found not only the environment to consolidate the power of collective value and corporate goals on a platform, and promote innovation in public institutions (Zhang et al., 2023), but also the foundation of prompting JS and satisfactory outcomes of individuals through its various affordances. With increasing deployment of ESM in contemporary public institutions in China, updated norms and policies about appropriately using and designing ESM should be formulated according to J-DR perceptions of users and organisational context. Consequently, public institutions should shift from developing novel functions of a new ESM tool to facilitating strategic and personalized management in differentiated scenarios for dynamic external environments. Even within same organisation, optimal allocation of internal resources, digital transformation capabilities of individuals, and better user experiences of working engagement are required.

## 6.4 Conclusion and Discussion

In contemporary organisations, various digital technologies are influencing routine work in new ways, which are categorised into four forms of conjoined agency in the research of Murray et al. (2020). According to their theory, the relationship between human and technology is based on how the interactive functions of the technology differentially affect the degree and predictability of organisational routines, such as protocol development and action selection. Among four types of conjoined agency with distinct technologies deployed in organisations, accordingly, *DingTalk* in the current study can be identified as the type of conjoined agency with assisting technology. The platform does not have the capacity to develop protocols, or select actions, but its affordances motivate people to reinvent its functions. Hence, this type of technology provides benefits to individuals and institution agency, but the impact of this tool on organisational routine is highly dependent on the dominant role of humans (Qinnan et al., 2022).

Essentially, the *DingTalk* platform is a human construction, and the SM contexts are often nested within the non-digital (physical) context (McFarland and Ployhart, 2015). Thus, the nature of *DingTalk* phenomenon is to facilitate interactive relationships and innovative process of *DingTalk* technology in the public sector in China, furtherly, to revise the existing theory of strategic organisational management within *DingTalk* environment. Based on extant studies, research of ESM phenomenon is still in the early stage of development, especially in the public sector in China. Advances in technology is inevitably changes social relationships and interactions in public institutions (PWC, 2018; Ardi and Putri, 2020). Through empirical interviews and survey of *DingTalk* users, the reciprocal relationships between human and ESM technology are integrated by data analytics in different scenarios of public institutions. Moreover, three aspects of determinants linking *DingTalk* use to JS improvement are confirmed in this study: the individuals' characteristics, leadership activation, and public service motives in public sector in China. Besides significant determinants, other moderating factors are depicted in our research framework too.

Therefore, this study answers both first and third research questions that the positive impact of *DingTalk* on employees' JS is found directly and significantly rather than its negative influences, compared to extant OB researches.

Secondly, as the *DingTalk* phenomenon emerging in industry is complex and multidimensional, this study confirmed its benefits and issues for employees through various perspectives and in specific management scenarios empirically. Thus, what should be taken into account is the present situations of public establishment in China and the specific technology affordances intertwined in the routine work. For instance, one informant argued that seriously relying on *DingTalk* could be a double-edged sword, because personally he perceived negative influences of *DingTalk*'s affordances of "complexity" and "incompatibility", then his efficiency, autonomy, and even active attitude of service would be impaired. Consequently, the correlations between *DingTalk* affordances and the JS of employee within the public organisation are examined in questionnaire analysis. Expanding on the perspective of socio-materiality theory, this study investigated the bilateral affordances of *DingTalk* technology, and found two positive affordances' influencing significantly on the JS of *DingTalk* users directly and two negative affordances' indirect effects on their JS. Through reflecting the causal relations and significant path coefficients among individuals, public organisational context, *DingTalk* technology, and their JS, this study answers our second research question that how are the significant correlations among these factors and the effects and this contribution extends theoretical research of technology affordance.

Thirdly, along with technology changes in social circumstances and public establishments, *DingTalk* users need to embrace the world of volatility, uncertainty, complexity, and ambiguity (VUCA) and shift to new means in the digital workplace (Qinnan, et al., 2022). Simultaneously, among various stakeholders, empathetic leader or manager is the proactive subject to promoting digital transformation and ESM-related action in public institutions (Liu et al., 2023).

Managers are in charge of delivering flow of information, propagating trust and values, through new communicative methods of ESM tool within every level of organisations.

As a good ESM organiser, their resourceful information, proactive attitudes, and devoted behaviours can help ESM users master advanced skills and complete various work tasks; thus, subordinates can feel more connected with their institutions and offer satisfactory performance. From our study, new corporate value and culture of collaborative symbiosis are reconstructed such as “dedication”, “innovative teamwork”, that provide spiritual support and empathy for *DingTalk* practitioners, especially in traditional public establishments. Only in this way, people-centred management in an ESM context, and a deeply interactive relation of co-workers will be developed in public organisation in China. Hence, empirical exploration of *DingTalk* phenomenon contributes to practical inspirations for staff, managers, and policy decision-makers in different public institutions in China. Ongoing appropriate use and design of *DingTalk* or other ESM tools in future will facilitate more efficient ways of working, prompt better human relations, differentiated collaborative dialogues, and influence employees’ well-beings directly. Thus, the research not only answers our first question of “how the *DingTalk* phenomenon”, also replies to fourth research question of “How can *DingTalk* usage prompt constructive impacts for sustainable development” previously.

Furthermore, with the advancement of disruptive techniques such as virtual reality, machine learning, neural networks, and crowdsourcing, other futural ESM tools could be a substitute for humans in decision-making, in-depth data gathering, and shaping jobs in profound ways, and even conduct routine work without human intervention (Murray et al., 2020). Hence, *DingTalk* use may be just one transitional phenomenon in this fast-developing industry. With the new technologies and upgraded ESM applications leapfrogging, this study does not prioritise the role of a specific technology tool “*DingTalk*” or limited research on particular chosen organisations, but empirically presents the essential relationships between *DingTalk* use and employees’ work attitudes, and relevant factors of JS research in public sector in China. Ultimately, this research aims to help revitalise JS of individuals and the corporate culture of state organisations, to achieve sustainable development of public institutions through developing ESM technology.

## 6.5 Limitations and Future Research Directions

There are many limitations to this study.

The first one is the representativeness of samples for interviews and the sampling size in quantitative data collection. Since the research objects of the thesis are public employees in China, six representative institutions in three types of public institutions, and participants of various job positions and departments were chosen. An online survey of one-month duration was conducted for a large sampling population and for as different results as possible in diverse institutions.

Nevertheless, although all the institutions are in the public sector in China, the interviewing participants of purposive sampling are not strictly homogeneous. The current study mainly focused on their commonalities under the *DingTalk* phenomenon, which might lead to biased findings because overemphasizing common features and ignoring the diversity in the phenomenon of interest can seriously impair the validity of study findings (Maxwell, 2013). Future research could consider institutional difference as one moderating variable or conduct attitudinal comparisons of different groups of *DingTalk* users.

What is more, *DingTalk* has millions of users in public institutions, but the sample size of the quantitative survey was relatively small for conducting SEM analysis. Future studies could improve the accuracy of statistical explanations with quantitative data from more participants from diverse departments. For instance, using python crawlers on websites can capture employees' opinions from the generalised results of the whole public sector rather than firm-specific data, and achieve high precision without human intervention (Stevanovic et al., 2012). A web crawling algorithm can grasp more information and turn massive unstructured text data of online reviews into categorised word frequencies (Luo et al., 2016). Therefore, gathering a great number of individual responses and understanding the nature of different institutional types, are anticipated to provide more evidences on the generalisability of the ESM phenomenon. The conceptual framework and conclusions of this thesis can be applied in other similar public contexts of ESM environment.



The second limitation is the measurement of JS, which is usually a dynamic process and varies with several determinants. The interviews and online questionnaire in current study only took a short snapshot of *DingTalk* users in chosen public organisations in 2021 and 2022. Besides, since there is no mature scale for Chinese employee's JS, this survey adapted and localised questionnaires based on classic literature and our interview results as instrument. Future exploration could consider a longitudinal study to enable a comprehensive measurement of variables for employees' JS in the research model. An investigation of other potential variables of Chinese employees' JS, such as other moderating components in our framework are still worthy of attention in future.

The third limitation is from data collection process of the study. A mixed methods approach of in-depth semi-structured interviews and online questionnaire were used in the thesis. However, whether an interview or a questionnaire, there is a concern that self-reported bias of some respondents might provide socially acceptable answers rather than real personal perceptions (Siemsen et al., 2010). The common-method bias can only be reduced by maintaining anonymity and confidentiality and by keeping a rapport with participants throughout the process of data collection (Donaldson and Grant-Vallone, 2002). This approach may lead to authentic answers and open-ended responses if participants feel as free as possible. The form of face-to-face interviewing would increase the likelihood of a closer rapport with interviewees if there was no pandemic outbreak in China.

The fourth limitation to this study lies in the languages used in the survey and questionnaire. Since the measurements and constructs were mostly adopted from the literature and English-speaking experts, they had to be translated into Chinese; this introduced the risk that nuances in meaning would not be expressed accurately. Therefore, a double/back-translation method was conducted by two English teachers (specialising in translation major) to check the back-translation of all the instruments and to minimise the impact of subtle nuance differences in translation.

Finally, with the disruptive development of the Internet and vast growth in online databases in China during recent years, text mining, descriptive data analysis and

modeling techniques could be combined as the research method. Utilizing novel ICT technologies and predictive data analytics for managing workforce and evaluating performance is a new area of human resource management for academic researchers (Tursunbayeva et al., 2018). Therefore, future studies could integrate multiple data sources to explore the ESM phenomenon, such as interviews, Internet documentation, observations, online forums, and surveys, to improve research robustness. Not only qualitative interviews can help deepen our understandings of psychological and behavioural changes, but also quantitative surveys and data mining through web crawler (Kausar et al., 2013); these approaches can be integrated to discover and retrieve widespread comments and information from Chinese websites for ESM research.

## **6.6 Summary of the Study**

Chapter 1 of this thesis introduces the research background to the *DingTalk* phenomenon in public institutions in China, the research gaps, the rationale for the research, and the research questions, aims, and objectives. With the prevalence of ESM technology, the diverse perspectives, attitudes, and behaviours of public employees are impacted by the changes of *DingTalk* use. Since there are few empirical studies on the relationship between ESM use and employees' JS, four research questions are proposed to address the research gaps. The main research aim is to explore how the *DingTalk* technology brings strengths and challenges to individuals and public establishments, and to what extent various factors affect general their JS.

Chapter 2 clarifies the key concepts of SM, ESM, JS, and JP, as well as dimensions and taxonomy of ESM. Various studies on JS with different definitions and theoretical models are reviewed in extant literatures. Job conditions, organisational support, personal characteristics, and corporate culture traits are examined and categorised for their significant roles in determining JS of employees. The theoretical perspectives of sociomateriality, technology affordances theory, and JD-R theory are integrated into an explanation of *DingTalk* phenomenon in current research.

Chapter 3 introduces the pragmatic mixed methods design with a social constructionist stance for the study. Qualitative interviews are considered as the primary approach, which are supplemented by a quantitative survey to address the research questions. In sequential mixed methods research, important themes as specific variables are identified from in-depth interviews, which produce the instruments and hypotheses for a following questionnaire.

Chapter 4 addresses the first and second research objectives of the study through qualitative data analysis and statistical evaluation of the online survey for public employees respectively. Thematic analysis was carried out to explore the variables and constructs from employees' perspectives and personal narratives about the *DingTalk* phenomenon. Then, various factors and relational components were tested respectively in four hypotheses, that quantitative results provided new evidences for the supplementary interpretation of *DingTalk* use impacting on public employees' JS evaluation statistically, based on extant literatures.

Chapter 5 addresses the third objective by presenting a conceptual framework that was generated from the mixed approaches; it presents four individual characteristics and four organisational factors related to *DingTalk* usage. The important personal traits are creativity, decisiveness, autonomy, and altruism for public employees in China. And the influencing elements from organisation include empathy, social responsibility, self-sacrifice of PSM and supportive leadership. Theoretically, this chapter interprets the significant factors impacting Chinese workers' JS, and the direct and indirect impacts on general JS through relations and technology affordances of *DingTalk* use. That contains positive and negative effect of ESM from the perspective of sociomateriality.

Chapter 6 addresses the fourth research question and presents the business implications by referring to the literatures. Strategic management linked to *DingTalk* tool design and deployment, especially practical guidance on how to increase the strengths of public sector general staff and leaders are interpreted, considering the local situation and cultural engagement in China. Thus, promoting the leverage effect of personal initiatives, strengthening team building, innovative learning, and

strategical leadership on the *DingTalk* platform are anticipated to positively facilitate the inner values and beliefs of employees and enhance organisational performance. In the future, along with the development of ESM applications, all employees, customers, and stakeholders should evolve with the evolution of new collaborative working pattern, public service, corporate culture, interpersonal relationship, and measurement of employees' well-being, in an organisation.

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## Appendix 1. Interview Questions

- 1) How long have you been working in this organisation? What is your work department? What do you do? How about your education background, age, working experience? Could you tell me more about your work?
- 2) How long have you used *DingTalk*? How do you use it? What is your working content related to *DingTalk* usage? Such as training courses, support between superior and subordinate, or special working characteristics, conditions? Can you tell me more?
- 3) After using *DingTalk*, do you think whether it impacts your job satisfaction? How does it work? Such as your personal characteristics, education background, working experiences, self-evaluated ability, and commitment to organisation? Is there anything else affecting your job satisfaction? Could you tell me more?
- 4) When especially compared with the situations of unused ESM tool before, has your attitude and behaviours towards your job been changed? How does it happen?
- 5) What is your corporate culture? Do you think it can affect your job satisfaction and how does it happen during using *DingTalk*? Do you know anything about common cultural factors in other state-owned institutions that might improve JS of employees during *DingTalk* use?
- 6) Whether the organisational factor and management strategies affect your job satisfaction? Is it related to the use of *DingTalk*? And how?
- 7) Have you experienced some negative issues about the usage of *DingTalk*? And how? For instance, unpleasant experience of using it, issues on work-life conflict, and other concerns? Do you feel any destructive feelings of the tool for your JS and your organisation?
- 8) Are there any management strategic suggestions for using *DingTalk* or other ESM technique in Chinese state-owned institution and enterprises to improve your job satisfactory?

## Appendix 2. Demographic Information Sheets of Interview Participants

#	Gender	Institution	Occupation	Duration of Software Usage
1	M	Media group	Senior manager of technology department	3 years
2	F	Media group	Newspaper senior editor	One year
3	F	Media group	Newspaper editor	2-3 years
4	F	Media group	TV editor	3-4 years
5	F	Media group	Journalist of New Media	4 years
6	M	State bank	Senior manager of technology department	2-3 years
7	M	State bank	Senior director of technology site	3-4 years
8	F	State bank	Clerk	2-3 years
9	M	Public hospital	Director of technology department	5-6 years
10	F	Public hospital	Technician	5-6 years
11	M	Public hospital	Administrator	More than one year
12	M	China FAW group	R&D senior engineer	Half a year
13	M	China FAW group	R&D junior engineer	2-3 years
14	M	China FAW group	Project manager	one year
15	M	China FAW group	Project administrator	2 years
16	F	Tax bureau	Civil servant	One years
17	F	Tax bureau	Civil servant	More than two years
18	M	Tax bureau	Section chief	4 years
19	F	Tax bureau	Deputy section chief	2 years
20	F	Tax bureau	Section chief	More than two years
21	M	Tax bureau	Director of a division	More than one year
22	M	China Telecom operator	Chief technology officer	5-6 years
23	M	China Telecom operator	Technical leader of department	More than two years
24	M	China Telecom operator	Technical staff	Less than one year
25	F	China Telecom operator	Technical staff	Two years



## **Appendix 3. Information Sheet and Consent Form for Interview Participant**

### **Information Sheet and Consent Form for Participant**

#### **Study Title**

Investigating the Impact of Enterprise Social Media on Job Satisfaction of Chinese Employees in Public Sector: Empirical Study on *DingTalk*

#### **Purpose of the Research**

The purpose of this research is to explore the phenomenon of enterprise social media *DingTalk* usage in the context of Chinese state-owned enterprises and government institutions, and develop a conceptual framework to explain the relations among technology, human, and organisational behaviours (OBs).

#### **Invitation**

Hi, my name is Zeng Xiaohui. I am doing doctoral research at the University of Wales Trinity Saint David. In fulfilment of this degree, I would like to conduct interviews with a group of Chinese employees in Public Sector.

You are being invited to consider taking part in the research study *An Enquiry into Job Satisfaction of Chinese public employees and relation to DingTalk*. This research is under the auspices of UWTSD.

Before you decide whether or not you wish to take part, it is important for you to understand why this research is being done and what it will involve. Please take time to read this information carefully. Ask us if there is anything that is unclear or if you would like more information.

#### **Why have you been chosen?**

You have been chosen because you got related experiences and we would like to hear your story. Your kind participation will definitely help us gain a better understanding the JS of Chinese state-owned and government employees and the impacts of using *DingTalk* on organisations. I am interested in hearing the story of your experience of being an participant.

#### **What will you have to do and how long will it take?**

You will have to answer some questions, including necessary demographic questions. The interview will last about 30 minutes. It will cover both your thoughts about your personal experience and your insights being a government employee of *DingTalk* users.

In a face-to-face interview, you will be provided the information sheet and a consent form. The researcher will ensure that you understand the ethical issues relating to the research and your consent to participate. In an online interview, the electronic version of information sheet and consent form will be sent to you beforehand. Then a question asking for your consent to take part in the research will be made. When you

provide positive answer which will act as a consent, the interview will then be an informal exploration of your experience and I look forward to hearing it. If possible, a second interview may be conducted only when the researcher gains your permission. I will be appreciated if you want to share voluntarily with me your view and experience after the interview.

**What will happen to the information collected?**

The personal information will be conducted anonymously. All data will be stored on the University cloud—One Drive and the researcher’s personal laptop protected by passwords—which will not be shared. Only the researcher and his supervisors have access to the data generated by the research activity. The information collected will be used by the researcher to write a research report for the credit of doctoral degree. It is possible that a doctoral thesis, articles, and presentations may be the outcome of the research.

**Declaration to participants**

If you take part in the survey, you have the right to:

- Refuse to answer any particular question, and to withdraw from the interview before completion.
- Ask any further questions via email about the interview that occurs to you during your participation.
- Be given access to a summary of report findings when it is concluded.

**Who’s responsible?**

If you have any questions or concerns about the project, either now or in the future, please feel free to contact either:

Researcher	Supervisor	Lead Supervisor
Xiaohui Zeng	Doctor Wilson Ozuem	Doctor Caroline Jawad
1811713@student.uwtsd.ac.uk	wilson.ozuem@cumbria.ac.uk	caroline.jawad@uwtsd.ac.uk



**Prifysgol Cymru**  
Y Drindod Dewi Sant  
**University of Wales**  
Trinity Saint David

## CONSENT FORM / 同意书

**Title of Project / 项目名称: Investigating the Impact of Enterprise Social Media on Job Satisfaction of Chinese Employees in Public Sector: Empirical Study on DingTalk**

**Name and contact details of researcher / 研究人员信息:**

Name/ 姓名: XIAOHUI ZENG

Email/ 邮箱: 1811713@student.uwtsd.ac.uk;

Please tick box if you agree with the statement.

- |    |                                                                                                                                                                  |                          |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| 1. | I confirm that I have read and understand the information sheet for the above study and have had the opportunity to ask questions.<br>本人确认已阅读并理解上述信息单，并获得了提问的机会。 | <input type="checkbox"/> |
| 2. | I understand that my participation is voluntary and that I am free to withdraw at any time.<br>我知道我的参与是自愿的，且我可在任何时候退出。                                           | <input type="checkbox"/> |
| 3. | I agree to take part in this study.<br>我同意参加这项研究。                                                                                                                | <input type="checkbox"/> |
| 4. | I understand that data collected about me during this study will be anonymised before it is submitted for publication.<br>我知道在本次研究中收集到的关于我的数据在提交发表前将被匿名处理。       | <input type="checkbox"/> |
| 5. | I agree to the interview being audio recorded.<br>我同意将访谈录音。                                                                                                      | <input type="checkbox"/> |
| 6. | I agree to allow the dataset collected to be used for future research projects.<br>我同意将收集的数据集用于未来的研究项目。                                                          | <input type="checkbox"/> |
| 7. | I agree to be contacted about possible participation in future research projects.<br>我同意研究者就进一步的研究联系我。                                                           | <input type="checkbox"/> |

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XIAOHUI  
ZENG  
Researcher

/ Aug. /2021  
Date

曾晓辉  
Signature

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## Appendix 4. Thematic Analysis Process of an Interview Transcript

A coded transcript of No. 23 interviewee			
Initial codes from No.23 transcript	Core codes	Sub-themes/ Category	Themes
<ul style="list-style-type: none"> <li>● 15 years' working experiences of research and development</li> <li>● bachelor degree</li> <li>● job scope covers internal management and external communication</li> <li>● using <i>DingTalk</i> from pandemic for 2-3 years</li> </ul>	Personal information of <i>DingTalk</i> users	Individual different attitudes and opinions towards <i>DingTalk</i> use	Theme 2: individual factors related to using <i>DingTalk</i>
<ul style="list-style-type: none"> <li>● Telecommuting during pandemic</li> <li>● Video meeting</li> <li>● Teamwork, group chat across various state-owned organisations</li> <li>● Message notification with "read" function</li> <li>● Storing project data by Ding-drive</li> <li>● A system dedicated to tracking project management</li> <li>● "Knowledge base" of <i>DingTalk</i> for training or sharing techniques</li> </ul>	Application scenarios and basic functions of <i>DingTalk</i> usage	Specific JS appraisalment of <i>DingTalk</i> users in various public institutions	Theme 5: General JS evaluation of <i>DingTalk</i> users in public sector
<ul style="list-style-type: none"> <li>● For classified projects, it is forbidden to transmit data through <i>DingTalk</i> or other general platforms</li> </ul>	Date and network security issue of using <i>DingTalk</i>	Negative issues and worries of using <i>DingTalk</i> Technique	Theme 4: negative technical issues of using <i>DingTalk</i>
<ul style="list-style-type: none"> <li>● <i>DingTalk</i> Interruption after work depends on different projects and stages of tasks</li> <li>● When there is emergent requirement from customers or issues, teamwork is necessary through using <i>DingTalk</i></li> </ul>	Personal life-work balance interrupted by using <i>DingTalk</i> is acceptable	Negative emotions and worries of using <i>DingTalk</i> Technique	
<ul style="list-style-type: none"> <li>● The interface between <i>DingTalk</i> and other software is incompatible</li> <li>● Incomplete global view in the task-presentation</li> </ul>	Disliked functions of <i>DingTalk</i>	Negative issues and worries of using <i>DingTalk</i> Technique	
<ul style="list-style-type: none"> <li>● Through comparison of different platform, found <i>DingTalk</i> is popular in the user market</li> <li>● It costs much if <i>DingTalk</i> users change to relearn other applications after long adaptation</li> </ul>	Various organisational management of <i>DingTalk</i> usage	Public institutional culture related to using <i>DingTalk</i>	Theme 3: Organisational environmental factors for <i>DingTalk</i> usage
<ul style="list-style-type: none"> <li>● During the changing revolution for traditional enterprise into digital management, using <i>DingTalk</i> as a new multiple workflow and communication means</li> <li>● <i>DingTalk</i> has been accepted in most public institutions</li> </ul>	Public institutional work atmosphere for using <i>DingTalk</i>	Public institutional culture benefit for JS and JP	

(Continues)

Initial codes from No.23 transcript	Core codes	Sub-themes/ Category	Themes
<ul style="list-style-type: none"> <li>● Communicative efficiency be improved</li> <li>● It decreases the cost of project management</li> <li>● The task assignment is clearer</li> <li>● The project management be improved a lot</li> <li>● The tool is a freeware</li> </ul>	Benefits of using <i>DingTalk</i> impacting on JS of individuals and JP of organisation	<i>DingTalk</i> usage as a new workflow for collaboration and communications in public institutions	Theme 1: using <i>DingTalk</i> as Job characteristics resources in workflow
<ul style="list-style-type: none"> <li>● Negative feeling to <i>DingTalk</i> is more related to corporate culture such as how leaders deal with work overtime</li> <li>● To understand different personality of young employees and control the using time length</li> </ul>	Negative impact on JS and JP during using <i>DingTalk</i>	Negative issues and worries of using <i>DingTalk</i> Technique; Specific JS appraisement of <i>DingTalk</i> users in various public institutions	Theme 4: negative technical issues of using <i>DingTalk</i>
<ul style="list-style-type: none"> <li>● The work is very fulfilling and stable</li> <li>● Individual competency is consistent with job content</li> <li>● Personal vision is consistent with company development</li> <li>● Satisfied salary and workplace</li> </ul>	Various influencing factors of JS unrelated to <i>DingTalk</i> use	Specific JS appraisement of <i>DingTalk</i> users in various public institutions	Theme 5: General JS evaluation of <i>DingTalk</i> users in public sector

## Appendix 5. A Summary Table of Themes from all Coded Transcripts

- Theme 1: *DingTalk* as job characteristics resources

Initial codes of interviewees' statements/ quotations	Core codes	Sub-theme
<b>Various functions of using <i>DingTalk</i></b>		
<i>Files from No.1 to No.25, covering 106 references</i>		
<ul style="list-style-type: none"> <li>- Administrative approval process</li> <li>- Time clock function daily</li> <li>- Video conference</li> <li>- Communication with external suppliers and customers, Group chats inside</li> <li>- Instant Message (with notification)</li> <li>- Ding-drive</li> <li>- Employee care</li> <li>- Live training and cloud learning</li> <li>- Task calendar, <i>DingTalk</i> call &amp; mail</li> <li>- Project management</li> <li>- Financial statistics</li> <li>- The organisational structure</li> </ul>	<ul style="list-style-type: none"> <li>- Various application scenarios of <i>DingTalk</i> usage and good functions</li> <li>- Benefits of <i>DingTalk</i> usage impacting on JS and JP</li> </ul>	<p><b>The way of using <i>DingTalk</i> as the social workflow</b></p>

(Continues)

Initial codes of interviewees' statements/ quotations	Core codes	Sub-theme
<i>From 11 files and 6 references</i>		
<ul style="list-style-type: none"> <li>- Using <i>DingTalk</i> needs a necessary working skill and new work mode for employees different from the past, so they are to be trained in public sector. (No.1, No.7, No.22, No.23)</li> <li>- Using the platform is convenient for young generation employees. (No.3, No.4, No.6)</li> <li>- Using <i>DingTalk</i> is efficiency, a novel online workflow in public institutions, which need to be updated in concepts. There is no boundary between on- and off-duty work, especially during the pandemic. (No.7)</li> <li>- <i>DingTalk</i> usage became the new workflow of state enterprises. (No.9)</li> <li>- It is a product of promoting communication and collaboration in digital era. (No.9, No.12, No.15)</li> <li>- Using <i>DingTalk</i> could ease my workload because the task is always existing in job content. (No.10)</li> </ul>	<ul style="list-style-type: none"> <li>- A new workflow and multiple communication for employees in public sector</li> </ul>	<p><b>A new way of multiple collaboration and communication in the social workflow</b></p>

(Continues)

Initial codes of interviewees' statements/ quotations	Core codes	Sub-theme
<i>From 12 files, including 10 references</i>		
<ul style="list-style-type: none"> <li>- It provides us freedom in some extent, that the reason we chose it. <b>(No.5)</b></li> <li>- How to use <i>DingTalk</i> is more related to leaders and the managers' leadership. So it has some relations to the software, but it doesn't always matter much. It helps the leaders more easily. <b>(No.7)</b></li> <li>- The digital development of our hospital needs the integrated platform urgently, and then after some comparisons of We Link, <i>DingTalk</i>, and enterprise WeChat, we chose <i>DingTalk</i> because of its larger user base and relatively early start. <b>(No.9)</b></li> <li>- Using <i>DingTalk</i> because of its complete functionality. The technique software influences entire work a lot. <b>(No.13, No.17)</b></li> <li>- Using the platform can do on-line training and interact with more users. The content can playback in numerous times. <b>(No.16)</b></li> <li>- The platform does not influence workers' JS effectively. <b>(No.18, No.21)</b></li> <li>- From the perspective of leaders, it is great tool for efficiency management, but it is just the reverse, from the aspect of employees. Some workers consider it is a controlling tool or constraint for their activities and discipline. <b>(No.19)</b></li> <li>- The tool has requirement for people too. You have to not only improve your work efficacy and time management, but also increase your capability to management others' schedule. <b>(No.20)</b></li> </ul>	<ul style="list-style-type: none"> <li>- Various perspectives and impacts of using <i>DingTalk</i> in public sector</li> </ul>	<p><b>A new way of multiple collaboration and communication in the social workflow</b></p>



(Continues)

Initial codes of interviewees' statements/ quotations	Core codes	Sub-theme
<i>From 12 files, including 10 references (Continuous)</i>		
<ul style="list-style-type: none"> <li>- <i>DingTalk</i> is a of an internal communication or internal process management tool. It has been popular in public institutions and of large users. <b>(No.22, No.23)</b></li> <li>- Seriously relying on <i>DingTalk</i> could be a double-edged sword. If any changes, it would be very costly to replace the software from both time and human resource. <b>(No.23)</b></li> </ul>	<p>Various perspectives and impacts of using <i>DingTalk</i> in public sector</p>	<p><b>A new way of multiple collaboration and communication in the social workflow</b></p>

- **Theme 2: Different Individual factors related to using *DingTalk***

Initial codes of interviewees' statements/ quotations	Core codes	Sub-theme
<i>From 25 files and 32 references</i>		
<ul style="list-style-type: none"> <li>- Descriptions of different education background (bachelor or postgraduate degree), age range, occupational history, current job grade, experiences of accepting technology software and actually using time length of <i>DingTalk</i> every day. <b>(No.1-No.25)</b></li> <li>- Individual competency (Chinese QZPS) and personality are very important for using <i>DingTalk</i>. It makes great effect on employees' JS. A more altruistic and communicative person will be easily recognised by departments than a less communicative one. ...For an employee, there are two significant aspects; one is competency, and the other is one's autonomy. <b>(No.1, No.9)</b></li> <li>- I am not good at or sensitive to using <i>DingTalk</i>, or other new software. <b>(No.3)</b></li> <li>- The level of JS of employees maybe varies at different career stage and age. And autonomy, competency, and ESM self-efficacy are benefit for their jobs. It does not only depend on one's own requirement for job treatment, career development, but also the recognition of social values from public work. There is a significant improvement in job satisfaction compared to the previous way of doing things. <b>(No.5, No.9, No.23)</b></li> <li>- Young employees in our institution are happy to make some innovations through the platform. <b>(No.6, No.7)</b></li> </ul>	<ul style="list-style-type: none"> <li>- Personal information of <i>DingTalk</i> users</li> <li>- Personal Competency (Application scenarios of <i>DingTalk</i> usage and basic functions)</li> </ul>	<p><b>Individual differences in public institution</b></p>

(Continuous)

Initial codes of interviewees' statements/ quotations	Core codes	Sub-theme
<i>From 25 files and 32 references (Continuous)</i>		
<ul style="list-style-type: none"> <li>- The stability of <i>DingTalk</i> is good for me. I think it's related to different understandings for job in various age groups. <b>(No.10)</b></li> <li>- Individual personality or experience will affect how one effectively use the tool and one's role in the job. For older employees, they have to cost more to learn it. Even for me, it is a burden at the beginning after adopting one more information channel. But I don't think it will have any direct impact on job satisfaction. <b>(No.20)</b></li> </ul>	<ul style="list-style-type: none"> <li>- Personal information of <i>DingTalk</i> users</li> <li>- Personal Competency (Application scenarios of <i>DingTalk</i> usage and basic functions)</li> </ul>	<p><b>Individual differences in public institution</b></p>

• **Theme 3: Organisational environment and culture for *DingTalk* usage**

Initial codes of interviewees' statements/ quotations	Core codes	Sub-theme
<i>From 17 files and 38 references</i>		
<ul style="list-style-type: none"> <li>- Request of more dedication and always up for new challenges. <b>(No.4)</b></li> <li>- The management mechanism is very standardized, and the decision-making process is top-down model. So, each job has its corresponding position and working intensity, and employees have to cooperate within a team. <b>(No.5, No.23)</b></li> <li>- Overtime, or 24-hour shifts should be considered normal for our work in hospital/ technology industry. It is unacceptable that you could not respond to emergent task in our department after-hour <b>(No.11, No.6, No.7)</b></li> <li>- The public interest of our hospital is the priority. This cultural aspect is the motivation or passion for everyone working hard in our post, and it is also a great determinant of job satisfaction. Our belief is knowledge and love, sincerity and professionalism. <b>(No.9)</b></li> <li>- Some classified aspects and issues need to be transmitted through our internal system, for the confidentiality purpose. <b>(No.21, No.4, No.5, No.8)</b></li> <li>- We will consider how to enhance job satisfaction and whether the corporate culture is strong enough. <b>(No.12)</b></li> </ul>	Organizational culture and institutional work atmosphere benefit for JS and JP	<b>Perceived corporate culture for <i>DingTalk</i> users in the public sector of China including PSM, leadership, and enlightened management mechanism</b>

*(Continuous)*

Initial codes of interviewees' statements/ quotations	Core codes	Sub-theme
<ul style="list-style-type: none"> <li>- The Internet industry is quite competitive and changes quickly. The corporate culture contains two parts: one is to be able to adapt to rapid change, and another is to be innovative. (No.14, No.20)</li> <li>- Overtime is a voluntary activity. A good guide from his superiors can encourage a more harmonious atmosphere. You can consider this as a process of growth for yourself in teamwork. (No.14, No.19)</li> <li>- Social responsibility is the core corporate culture. (No.15)</li> <li>- Strong work discipline is our corporate philosophy. (No.17)</li> </ul>	<p>Organizational culture and institutional work atmosphere benefit for JS and JP</p>	<p><b>Perceived corporate culture for <i>DingTalk</i> users in the public sector of China including PSM, leadership, and enlightened management mechanism</b></p>

• Theme 4: Technical issues of using *DingTalk*

Initial codes of interviewees' statements/ quotations	Core codes	Sub-theme
<i>From 17 files and 38 references</i>		
<ul style="list-style-type: none"> <li>- <i>DingTalk</i> connects to the outside, but does not connect to intranet; thus, there is no worry about the data security. (<b>No.10, No.6, No.11</b>)</li> <li>- We keep a concern about the confidentiality of <i>DingTalk</i> platform. The IT operation team does encryption for the entire company network, so the entire network with confidential data is isolated from internal private network. (<b>No.7, No.8, No.9, No.14, No.18, No.20, No.23, No.24</b>)</li> <li>- The tool cannot manage the overall process of a software project from startup to closeout, especially on each phase. (<b>No.9</b>)</li> <li>- This software blurs the boundary between life and work. The tool became a hindrance to the satisfaction of job itself. The specialized features, confidentiality and other features of <i>DingTalk</i> need to be more improved in public enterprises. (<b>No.2, No.15, No.20</b>)</li> <li>- As I know, almost all state institutions have their state-owned office system or private internal network. A lot of data has to go through that for confidentiality. Using <i>DingTalk</i> to make the best of its strength, but avoid it when we are in some classified military projects. (<b>No.21</b>)</li> </ul>	<ul style="list-style-type: none"> <li>- Network security of using <i>DingTalk</i> issues</li> <li>- Disliked functions of using <i>DingTalk</i> in daily work</li> </ul>	<p><b>Technique negative impacts of <i>DingTalk</i> usage</b></p>

(Continuous)

Initial codes of interviewees' statements/ quotations	Core codes	Sub-theme
<ul style="list-style-type: none"> <li>- This software cannot be compatible with other platforms. (No.22)</li> <li>- The tasks of <i>DingTalk</i> are decentralized and there is no one global map in main functionality. (No.23)</li> <li>- So many groups in <i>DingTalk</i> are scatted and not well organised, thus, information is overload for people. (No.14, No.24)</li> </ul>	<ul style="list-style-type: none"> <li>- Network security of using <i>DingTalk</i> issues</li> <li>- Disliked functions of using <i>DingTalk</i> in daily work</li> </ul>	<p><b>Technique negative impacts of <i>DingTalk</i> usage</b></p>

- Theme 5: General JS evaluation of *DingTalk* users in public sector

Initial codes of interviewees' statements/ quotations	Core codes	Sub-theme
<b>Positive arguments:</b>		
<i>From 25 files and 44 references</i>		
<ul style="list-style-type: none"> <li>- Transparent appraisals and performance awards through it are relatively fair. <b>(No.1, No.9)</b></li> <li>- Software is to increase the convenience of our work, and free up some labour. <b>(No.10, No.14, No.15, No.22, No.24)</b></li> <li>- It improves our JS clearly. <b>(No.2, No.3, No.4, No.6, No.11, No.12, No.16, No.17, No.18, No.22)</b></li> <li>- The experience of overall Functionality is pretty good. <b>(No.3, No.4, No.13)</b></li> <li>- It improves efficiency and humanistic care from some aspects. <b>(No.6, No.8, No.19, No.21, No.22)</b></li> <li>- It improves our communicative efficiency and project management, and it makes cost reduction for company positively. <b>(No.6, No.23, No.24, No.25)</b></li> <li>- It is flexible and no one feel dissatisfied. <b>(No.5)</b></li> <li>- Simply through using DingTalk software may not largely increase job satisfaction, because for each software has a certain cost in time or other aspects. To enhance their satisfaction by DingTalk, its design should be more friendly and integrated with their daily work. <b>(No.9)</b></li> </ul>	Benefits of <i>DingTalk</i> usage impacting on JS and JP	<b>Various JS appraisal of <i>DingTalk</i> users in Chinese public context</b>



(Continuous)

Initial codes of interviewees' statements/ quotations	Core codes	Sub-theme
<b>Negative arguments:</b>		
<i>From 7 files and 23 references</i>		
<ul style="list-style-type: none"> <li>- So many groups in <i>DingTalk</i> are scatted and not well organised, thus, information is overload for people. (<b>No.14, No.24</b>)</li> <li>- This software blurs the boundary between life and work. The tool became a hindrance to the satisfaction of job itself when my work efficiency was decreased by it. (<b>No.2, No.20</b>)</li> <li>- The technology continuity and relevance of <i>DingTalk</i> are still poor in performance. (<b>No.22</b>)</li> <li>- The tasks of <i>DingTalk</i> are decentralized and there is no one global map in main functionality. (<b>No.23</b>)</li> <li>- The tool cannot manage the overall process of a software project from startup to closeout, especially on each phase. (<b>No.9</b>)</li> </ul>	<ul style="list-style-type: none"> <li>- Disliked functions of <i>DingTalk</i> for JS and JP</li> <li>- Personal life be interrupted by using <i>DingTalk</i></li> </ul>	<p><b>Various JS appraisalment of <i>DingTalk</i> users in Chinese public context</b></p>

(Continuous)

Initial codes of interviewees' statements/ quotations	Core codes	Sub-theme
<b>Other factors unrelated to <i>DingTalk</i> use:</b>		
<i>From 19 files and 450 references</i>		
<ul style="list-style-type: none"> <li>- JS is more related to one's job content, performance and recognition from others. <b>(No.14)</b></li> <li>- Stable work and low working intensity, little pressure <b>(No.8, No.10, No.11, No.18, No.19)</b></li> <li>- Harmonious interpersonal relationship <b>(No.6, No.11, No.18)</b></li> <li>- Personal characteristics <b>(No.9)</b></li> <li>- Working environment, management mechanism and culture <b>(No.7, No.9, No.12, No.13, No.14, No.15)</b></li> <li>- The salary, working conditions <b>(No.1, No.5, No.15, No.23, No.24, No.4)</b></li> <li>- Work in a promising industry, personal interests and strengths, the innovative tasks are challenging and interesting <b>(No.6, No.7, No.9, No.12, No.13, No.14, No.23)</b></li> <li>- Gain learning platform, cutting-edge technology, and broad vision in future <b>(No.1, No.5, No.15, No.23, No.24)</b></li> <li>- To serve the customer to gain satisfaction <b>(No.16, No.21, No.25)</b></li> <li>- Social recognition, job achievement such as healing the wounded and rescuing the dying, making social values <b>(No.4, No.5, No.9, No.11, No.18, No.19, No.22)</b></li> <li>- Spiritual and material rewards, holidays, and traveling vacation <b>(No.8, No.9, No.22)</b></li> </ul>	<ul style="list-style-type: none"> <li>- Various factors of JS in Chinese public context unrelated to <i>DingTalk</i> usage</li> </ul>	<p><b>Various JS appraisalment of <i>DingTalk</i> users in Chinese public context</b></p>

## Appendix 6. Semi-structured Questionnaire

Dear Participant,

My name is Xiaohui Zeng. I am studying doctor of business administration (DBA) at the University of Wales Trinity Saint David, and I would like to invite you joining in my survey. I would greatly appreciate for your participation and valuable insight.

This survey is part of my DBA program, and it is a critical stage required for my research. The data retrieved from this survey will be kept confidential and anonymous, which is used strictly for research and academic purposes.

The primary purpose of this study is to explore the phenomenon of enterprise social media *DingTalk* usage influencing employees' JS and behaviours in the context of Chinese state-owned enterprises and government institutions. Your contribution is essential and vital for this study to gain more understanding of the knowledge.

Please feel free to contact me if you have any questions. My contact information is provided at the end of the questionnaire.

Regards,

DBA Student: Xiaohui Zeng

Email: 1811713@student.uwtsd.ac.uk

Contact mobile:

University of Wales Trinity Saint David

Dear Madam/Mr.

Thank you very much for your participation in this questionnaire survey. The main research objective is to explore the impact of enterprise social media *DingTalk* usage on employees' JS in Chinese state-owned enterprises and government institutions. This survey is conducted anonymously and intends for pure academic study only. It does not involve any other privacy or confidentiality. Thank you for your cooperation and support!

I have read the information about this research and signed a consent form

### Section 1 Background and demographics. (8 items)

1) Your gender:

Male  Female  Non-binary  Don't want to say

2) Your age group:

18-24 years old  25-34 years old  
 35-44 years old  45-54 years old  More than 55 years old

3) Your last education experience:

Degree of High school (technical secondary school) and below  
 Bachelor Degree  Master degree or above

4) How long have you been working in public sector?

Five years and under  6-10 years  11-15 years  
 16-20 years  21 years and above

5) What is your current job title?

Staff  Technical professionals  Middle manager  
 Senior manager  Others

6) How large is your institution size?

20 persons and less  21-50 persons  
 51-100 persons  More than 100 people

7) Which field of public sector do you work in?

Economy service  Social management  Information technology industry  
 Health care  Media group and publishing  Automotive manufacturing industry  Others

8) How long do you use *DingTalk* in average during work every day?

Less than one hour  1-3 hours  
 4-6hours  More than 6 hours

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Please choose the answer which can mostly present your real situation from 1 to 5 as following, with:

“1”- strongly disagree; “2”- disagree; “3”- Neutral ; “4”- agree;  
“5”- strongly agree.

Section 2 *DingTalk* as a job characteristics resource (6 items)

- 1) *DingTalk* helps specify my tasks clearly.  
1 2 3 4 5
  - 2) *DingTalk* helps improve my work efficiency.  
1 2 3 4 5
  - 3) *DingTalk* helps improve the quality of my work.  
1 2 3 4 5
  - 4) I can communication with others more directly and quickly by using *DingTalk*.  
1 2 3 4 5
  - 5) *DingTalk* enables me to easily carry out my work either at home or on the way to home/ work.  
1 2 3 4 5
  - 6) In the digital age, *DingTalk* helps achieve following organisational edges (multiple choice question):
    - Flat structure management Simplify workflow
    - Cut costs of human resource/ product
    - Improve organisational efficiency Enhance social value
    - A good assistance during the pandemic
    - Create a good corporate culture Don't know
    - Others\_\_\_\_\_
- 

Section 3 Individual factors influencing JS through using *DingTalk* (4 items)

- 7) I would like to proactively use most functions of *DingTalk* to complete tasks, which is beneficial to achieve better job performance.  
1 2 3 4 5
  - 8) After using *DingTalk* , I feel more confident that I can quickly find the solutions when I met difficulties during the work.  
1 2 3 4 5
  - 9) After using *DingTalk* , my creativity at work has been improved.  
1 2 3 4 5
  - 10) I would like to use *DingTalk* to cooperate to work and share knowledge with others.  
1 2 3 4 5
- 

Section 4 Organisational environment about the *DingTalk* usage. (4 items)

- 11) *DingTalk* helps me better in committing with social responsibility and obligations to serve the public.  
1 2 3 4 5
- 12) *DingTalk* helps me to better understand and empathise the plight of the others.

1 2 3 4 5

13) I am willing to use *DingTalk* to work at any time, even at the expense of off-work time.

1 2 3 4 5

14) The encouragement from superiors will support me to use *DingTalk* to work with more pleasure.

1 2 3 4 5

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## Section 5 Technical issues by *DingTalk* usage (11 items)

### Negative influences of *DingTalk* usage

#### Tech-overload (3 items)

15) I am easily connected by others in the use of *DingTalk*'s DING function, which makes it difficult for me to concentrate on my work in low efficiency.

1 2 3 4 5

16) I am often overwhelmed by the constant tasks posted on *DingTalk*.

1 2 3 4 5

17) I am often exhausted from all the urgent work tasks posted on *DingTalk* that need to be replied immediately.

1 2 3 4 5

#### Tech-invasion (2 items)

18) Using *DingTalk* to keep in touch with my job after work has taken up lots of my personal space and time with family/friends.

1 2 3 4 5

19) Using ESM tools such as *DingTalk* in non-working location and after-hours, I find it a challenge to my work-life balance.

1 2 3 4 5

#### Tech-function issues

#### Tech-complexity and incompatibility (3 items) (reversed)

20) Since some functions of *DingTalk* are not specialised for our department, which often bring some inconvenience to my work.

1 2 3 4 5

21) I find *DingTalk* is hard to completely compatible with other software in my current work system.

1 2 3 4 5

22) *DingTalk* takes lots of time and effort for me to master all skills of the ESM tool.

1 2 3 4 5

Tech-insecurity (3 items)

23) I can handle cautiously with the possible work data breach and data security risks caused by *DingTalk* .

1 2 3 4 5

24) I can trust *DingTalk* to share internal documents of organisation to the external.

1 2 3 4 5

25) I think the technique risks caused by using *DingTalk* in my work outweigh much than its benefits.

1 2 3 4 5

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Section 6 General JS (Job satisfaction) (4 items)

26) In general, *DingTalk* helps improve my sense of achievement and value at work.

1 2 3 4 5

27) In general, *DingTalk* helps my cooperation with colleagues more harmonious and pleasant.

1 2 3 4 5

28) In general, *DingTalk* brings me more possibilities for future career development.

1 2 3 4 5

29) In general, *DingTalk* helps me feel relaxed and joyful with my work.

1 2 3 4 5

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Section 7 Open-ended questions (2 items)

This is the last section of the questionnaire.

- 1) What improvement (including design and use) do you think should be made for *DingTalk* to increase your job satisfaction?
- 2) Do you have any other suggestions for using ESM tool during work?