An Empirical Study on Enterprise Information Systems for Smart Manufacturing in Taiwan

Completed Research Paper

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Abstract

Enterprise information systems (EIS) provide as a platform that enables organizations to integrate and coordinate their business processes on a robust foundation. An EIS is used in conjunction with customer relationship management and supply chain management to automate business processes and is currently essential to enterprise; meanwhile, the EIS related issues in smart manufacturing are also increasing accompanying with the progress of Industry 4.0 as well. This study aims to explore the determinants of EIS adoption in smart manufacturing, therefore a research model combining with TOE and TTF is developed to exam the correlation and importance of EIS implementations to smart manufacturing. The study involved 77 samples that were collected from the enterprises are engaging smart manufacturing in Taiwan. Structural equation modeling was employed for analysis. The preliminary results first confirmed our proposed research model is appropriate for exploring the issues about EIS and smart manufacturing and also indicated that all the TOE related determinants have positive effect of EIS adoption in smart manufacturing. The research findings provide a comprehensively view to explore the relevant issues and further direction to EIS in smart manufacturing, and it would be useful to enterprise systems implementation and decision-making for smart manufacturing. The paper concludes with implications and suggestions for future research.

Keywords: Enterprise Information Systems, Smart Manufacturing, TOE, TTF

Introduction

Enterprise information systems (EIS) plays an essential role in the development of smart manufacturing. EIS first appeared around 1970 (Jacobs 2007), which was mainly used to solve the phenomenon of globalization, mergers and acquisitions at that time (Chang et al. 2003), and improve the internal company management (Häkkinen and Hilmola 2008). In response to different management functions, various types of information systems related to enterprise operation management have various developments and applications, such as enterprise resource planning (ERP), customer relationship management (CRM), supply chain management (SCM), knowledge management system (KMS), and business intelligence (BI) that are increasingly valued by companies. From the perspective of adopting the type of enterprise information system, ERP is still the largest enterprise information system, and the following are CRM and BI, which shows that more and more enterprises will adopt EIS for their work, which represents EIS becomes the indispensable operational tools for enterprises (Statista 2016).

In addition, as the development of communication technology and service innovation, such as cloud-computing, service-oriented architecture (SOA), big data, and internet of things (IoT), business activities are gradually transferred to the virtual environment. As the same time, EIS is used to become most enterprises' process architecture, core abilities and strategic tools to assist the progress of business activities (Cascio 1995; Marston et al. 2011; Strong et al. 2006)

With the rapid development of communication technology, mobile devices and cloud technologies, what enterprises really demand is changing because of enterprise systems. According to most related literature reviews about enterprise information systems over the years, most of which are discussed and analyzed from the perspective of ERP (Moon 2007; Shehab et al. 2004). There are scarcely literature reviews used to analyze from the perspective of the overall enterprise information system (Wu et al. 2016). With the changes of the competitive environment and oncoming of the industry 4.0, the current status and future development of enterprise information systems and smart manufacturing are worthy to do further research and exploration.

Smart manufacturing is a complex engineering system. In principle, it includes the following elements, such as manufacturing execution system (MES), IoT systems that combines virtual production and real production, automotive production line, and highly intelligent production line control system. It can be seen from the above that if the above-mentioned elements are not interpreted by the software systems, the optimization of the management and decision-making of the smart manufacturing cannot be achieved. It means that it is difficult to create a complete intelligent manufacturing system. According the past literature of enterprise information systems over the years, the relevant research of enterprise information systems has focused on the integration of information technology and enterprise information systems (Wu et al. 2016). Therefore, the study hopes to understand the needs of enterprises for enterprise information systems under the trend of smart manufacturing development, and to explore the adoption and decision-making of enterprise information systems from the perspective of technology-organization-environment.

This study mainly explores the adoption of enterprise information systems with smart manufacturing enterprises. Moreover, developing research frameworks that integrate characteristics of technology, organization, environment and technology tasks, and conducts empirical research on the impact of enterprise information systems. The main research objectives are as follows:

(1) To explore the status relationship of EIS adoption in smart manufacturing;

(2) To exam the related determinants of EIS adoption in smart manufacturing with TTF and TOE perspective.

(3) To explore the relationship between EIS adoption and smart manufacturing including task fitting, characteristics of technology, and characteristics of organization.

Literature Review

Enterprise Information Systems (EIS)

According to the Gartner Group survey report in 2015, Worldwide expenses on enterprise application software will grow 7.5 percent to reach US$149.9 billion in 2015, increasing to more than $201 billion in 2019 (Gartner 2015). It shows that more and more enterprises will adopt enterprise information systems as competitive innovative information capabilities and strategic tools, and ERP is the most important auxiliary tool in enterprise information systems.

For enterprises, the finance, human resource, manufacturing and inventory management have been integrated in EIS. Not only can EIS enable organizations to automate their business processes, but it also redesigns, improve and introduce innovative processes. Through working across functional departments and the communications infrastructure embedded in the systems, it can take more benefit from the systems (Anaya et al. 2015).

Therefore, EIS involve considerable enterprise process analysis, employee retraining and new work processes (Olson et al. 2011), including ERP, CRM, SCM (Hendricks et al. 2007) and BI (Wang 2015) one of which, ERP, is widely used in enterprise. Through multi-dimensional, integrative and normative nature, EIS offer the depth of functionality and breadth of integration required for managing global operations of business organizations today, which has a significant impact on enterprises.

The evolution of enterprise information systems can be traced back to the material requirement planning (MRP) in the 1980s. Next, with the development of information technology and the change of industrial demand, the material requirement planning (MRP) gradually evolved into the manufacturing resource planning (MRP II). In the 2000s, ERP emerged, integrating SCM and CRM. Moreover, with the development of the knowledge economy and big data, enterprise information systems (EIS) or enterprise systems (ES) become more flourished.

Table 1. Table The issues and the research direction of EIS

Stage	Issue	Definition and resource
1998~2000	Implementation	In this period, the main topic is to discuss the enterprises implementation of ERP. The main topics of implementation: platform architecture modeling, system import, product life cycle (Boykin et al. 1999; Holland and Light 1999; Košturiak and Gregor 1999; Shaw 2000)
2001~2005	Implementation Using ERP Extension Education	In this period, the main topic is to discuss the ERP import and implementation benefits for enterprise. With the development of information technology, the issue of expansion had gradually emerged, and it had begun to expand into the information system within the enterprise. The main topics of expanding: exploring the integration of EIS systems with other information systems, such as the integration of ERP and KM. (Newell et al. 2003)
2006~2009	Implementation Using ERP Extension Value Trends Education	In this period, ERP is the main topic of discussion, extending to the upstream and downstream SCM and CRM. The main topics of implementation: EIS import strategy and benefit is the main topics of discussion.(Arnold 2006; Gebauer and Lee 2008; Huang and Hu 2007; Ignatiadis and Nandhakumar 2007; Rikhardsson and Kræmmergaard 2006) Secondly, import key success factors (CSF) and Training (Arnold 2006; Gebauer and Lee 2008; Huang and Hu 2007; Ignatiadis and Nandhakumar 2007; Rikhardsson and Kræmmergaard 2006), such as construct a dynamic key success factor model (King and Burgess 2006) to respond the changes in the business environment.

2010~2016	Implementation Using ERP Extension Value Trends Education	In this period, with the development of the knowledge economy, the issues had shifted from the "economic competition" to the "knowledge competition”. The main topics of trend: While small and medium enterprises (SMEs) and other industries continue to adopt EIS as operation management, the implementation issues of EIS are gradually moved to the adoption and implementation of SMEs. In the technology field, it is used for visualization, context awareness, data value chain engagement, human learning and continuous education.(El Kadiri et al. 2016)
2017~2018	Implementation Using ERP Value Extension Trends	In this period, while cloud computing and big data become flourished, more research has gradually focused on the relationship between ERP, cloud computing and big data. Value Issues: exploring the overall performance of the enterprise after using the cloud ERP service and discussing the complexity of the supplier group as a moderator.(Gupta et al. 2018) Expanding Issues: enterprise architecture (EA) makes the organization's business processes, information, information systems in accordance with the enterprise’s goals, and develops a theoretical framework to explore EA (Niemi and Pekkola 2017) Trend topic: exploring the relationship between big data analysis, enterprise analysis and EIS, and developed ASEIS (Business Analytics Service-Based EIS, ASEIS) which is used to resolve the problems in enterprise analysis, big data and business intelligence. (Sun et al. 2017)

In the previous studies, most of them focus on the adoption and performance of enterprise resource planning systems, and less on the overall view of EIS (Malhotra and Temponi 2010). Besides, the direction of development of enterprise information systems will have different types of service innovation along with the development of cloud technology and big data (Niemi and Pekkola 2017; Sun et al. 2017). With these development trends, EIS integration is more important for enterprises.(Maiga et al. 2015). As a result, this study aims on the overall EIS perspective to comprehend the enterprises adoption factors on EIS.

Smart Manufacturing

In the past few years, some advanced manufacturing countries such as Germany and the United States have developed technologies in various fields to achieve smart manufacturing. The main technologies are internet of things (IoT), cyber-physical system (CPS) and cloud computing, and so on. With the intensive development and application, these technologies have been applied in various fields such as manufacturing, health, and building management to achieve smart manufacturing. The past related researches have analyzed and proposed the direction of future technology development.

The Industry 4.0 term first appeared at Hannover Messe in 2011. The report indicates that Industry 4.0 builds unprecedented value and brings new innovative business models on the IoS and cyber-physical systems (Kagermann et al. 2013), integrating IT technologies, modeling, simulation, big data, cloud computing, sensors and smart energy technologies. As a result, smart manufacturing plays an important role in Industry 4.0.

The research and development programs related to manufacturing in the U.S. focus on key technology assignments, including IoT, big data, data analytics, CPS, system integration, sustainable manufacturing, and additive manufacturing to respond aggressively to the innovative manufacturing environment change. The U.S. is aggressive in budgeting research and development, and executing programs for manufacturing, which is also called an advanced manufacturing or Smart Manufacturing. For smart manufacturing, the research focuses on the development and application of advanced technologies and technological interoperability in all areas. The implementation of smart manufacturing is not only applicable to certain processes, but also to the entire enterprise or supply chain.

Furthermore, according to Research and Markets' s global analysis and forecasts about smart manufacturing market from 2017-2026, smart manufacturing involves the use of automation equipment and the aim to be achieved through this process is the use of information technology to use it for the advantage of reaching a global market. This manufacturing decreases the workload and makes for more flexibility in the entire process. It is a method of manufacturing which aims at optimizing the concept, product manufacturing, and transaction process. For the purpose of smart manufacturing, some of the information technology are be used to attain the goal, such as enterprise manufacturing intelligence, manufacturing execution system, warehouse management system. It is why this study tries to establish the model to explain their relationship.

Task-Technology Fit Theory (TTF)

Task-Technology fit theory (TTF) plays an important role in IS/IT field, having been widely applied in lots of research. TTF model contains main dimensions including: (1) Characteristics of task: Characteristics of task are broadly defined as the actions carried out by individuals in turning inputs into outputs ; (2) Characteristics of technology: including software, hardware, data and user service ; (3) Characteristics of organization: the ability and experience of the organization in performing special actions ; (4) Task-Technology fit: the extent to which technology can help individuals accomplish a specific task ; (5) Use: task-technology fit will affect the degree of use, and the degree of use will further affect job performance ; (6) Performance: including improving efficiency and quality of work.

In recent years, many studies based on TTF to use information systems or to assess the performance of information systems in the different information and technological environments, including E-learning (Larsen et al. 2009; Lin and Wang 2012; McGill and Klobas 2009), adoption of wireless technology (Yen et al. 2010), adoption of social networking sites (Lu and Yang 2014), mobile commerce (Junglas et al. 2008). The study combines the TTF model and institutional theory. In order to make the research structure not too complicated and avoid excessive variables, and to further explore the affecting of key factors, the study refer to the relevant empirical research (Larsen et al. 2009; Lin and Wang 2012; McGill and Klobas 2009).

Gebauer and Ginsburg (2009) explored the support of action information systems for professionals from the perspective of the entire organization and use TTF as a discussion of the suitability of action information. In summary, TTF has a key influence on the application of technology in science, environment, organization and other related fields. So far, most scholars still use this to explore the suitability of technology and task matching in order to understand the key factors through this model.

Technology-Organization-Environment Theory (TOE)

Drazin (1991) from the perspective of technology innovation processes to develop the technology-organization-environment (TOE) theory and explore the adoption of innovation technology. They also established three levels of TOE architecture for the adoption and implementation of the enterprise's technology innovation: (1) Characteristics of technology: internal and external technologies of company ; (2) Characteristics of organization: descriptive measures of organization, such as company size and scope, management structure and internal resources ; (3) Characteristics of environment: the environment of business, such as its industry, competitors and transactions with the government.

Research in other IS fields also provides some empirical support for the TOE architecture. Chau and Tam (1997) adopted TOE to identify three factors that influence the adoption of open systems, including the characteristics of innovation, organization technology, and external environment. Research about the use of e-business also provides consistent empirical support. For example, Zhu et al. (2003) believe that companies with relative strong technical capabilities perform better, moreover larger companies are more likely to engage in enterprise electronics. On the other hand, trading partners which lack of readiness can hinder the company's adoption of electronic. In addition, Zhu and Kraemer (2005) found that technical capabilities, company size, financial commitment and competitive pressure are important factors in participating in the electronic of enterprises. Based on the above, it can be seen that TOE architecture has a lot of literature support on EIS, IT, IS, E-Business and other issues. Thus, this study uses TOE as the research framework to further explore the factors of EIS adoption.

Research Methodology

Research Design

This study focuses on the factors that influence the adoption of enterprise information systems in smart manufacturing companies, and the samples are collected from Taiwanese smart manufacturing companies.

Research Hypotheses

Task-Technology Fit Architecture

In the task-technology fit theory, it is considered that the fit of the characteristics of technology, task characteristics and characteristics of organization will affect the user's cognition and belief, further affecting the organization's adoption(Goodhue and Thompson 1995). In addition, when the technology used by the organization can support and assist the task, it can help the organization to accomplish tasks more easily (Goodhue 1988). In addition, in the study of the influence of characteristics of organization on adaptation, scholars found that the more fit of characteristics of tasks, characteristics of technology and characteristics of organization can not only support each other, but also enhance the competitive effect and assist achieving the goal of the enterprise(Delery and Doty 1996; Ruekert and Walker Jr 1987; Snell et al. 1996). As a result, it can be confirmed a positive relationship between the characteristics of organization and task-technology fit. This study proposes the following hypothesis:

H1: " Characteristics of Task" has a positive effect on "Task-Technology Fit".

H2: " Characteristics of Technology " has a positive effect on "Task-Technology Fit".

H3: " Characteristics of Organization" has positive effect on "Task-Technology Fit".

In the model of task-technology fit theory, task and characteristics of technology can be used to predict task-technology fit (Cooper et al. 2000; Goodhue 1988; Goodhue and Thompson 1995; Rivard and Huff 1988). When the task-technology fit increases, it will directly affect the performance improvement. Suh (1999) points out that the task-technology fit will positively affect the satisfaction of use. (Goodhue and Thompson 1995) pointed out that after using the enterprise systems, users will have positive or negative evaluations of the enterprise systems, which changes their expectations of the enterprise systems and whether being willing to reuse. As a result, this study proposes the following hypothesis:

H4: "Task-Technology Fit" will positively affect " EIS Adoption ".

Characteristics of Technology and EIS Adoption

According to the past literatures, if the internal information system infrastructure is not perfect, it will hinder the implement of new information systems (Kuan and Chau 2001). In addition, Kwon and Zmud (1987) emphasize that companies must have good internal resources such as the infrastructure and technical capabilities in order to successfully implement information technology. As a result, this study proposes the following hypothesis:

H5: "Characteristics of Technology " has positive effect on " EIS Adoption ".

Characteristics of Organization and EIS Adoption

According to the past research, the cost of purchasing new information technology is a considerable expense for the organization. Therefore, sufficient financial resources are one of the indispensable key factors (Bouchard 1993). Next, in organization, if the executives actively participate in new information technologies, it has a significant impact on the adoption of new information technologies (Boynton and Zmud 1984). Furthermore, one of important reasons for enterprises to implement information technology was whether they were supported by users. If employees can support the organization's policies, they will be willing to participate in the process of implementation, which often improves the success rate of the project (Bhattacherjee and Premkumar 2004). In addition, in the process of implementing new information technology, the personnel of information department play an irreplaceable role because their professional knowledge and skills assist solving various problems, such as implementing new information technology and its maintenance. (Baroudi 1985; Nelson and Cheney 1987; Noll and Wilkins 2002; Trauth et al. 1993). Besides, if general users have basic professional knowledge and skills for new information technology, the adoption and use of new information technology will be more successful. According to the above characteristics of organization, this study believes that if the above characteristics of organization are higher, it will positively affect the adoption of enterprise information systems. Therefore, this study proposes the following hypothesis:

H6: "Characteristics of Organization" has a positive effect on " EIS Adoption ".

Characteristics of Environment and EIS Adoption

(Tornatzky et al. 1990) argue that the external environment of the organization will affect the innovation of the enterprise systems within the organization, and the external characteristics of environment are one of the most widely discussed topics in the adoption of enterprise systems (Baker 2012). In addition, the internal demands of the organization and the external environment are important factors affecting the adoption of enterprise systems (Bajwa et al. 2004). Therefore, based on the above content, this study proposes that characteristics of environment will positively influence the organization's adoption of enterprise information systems.

H7: "Characteristics of Environment" has a positive effect on " EIS Adoption ".

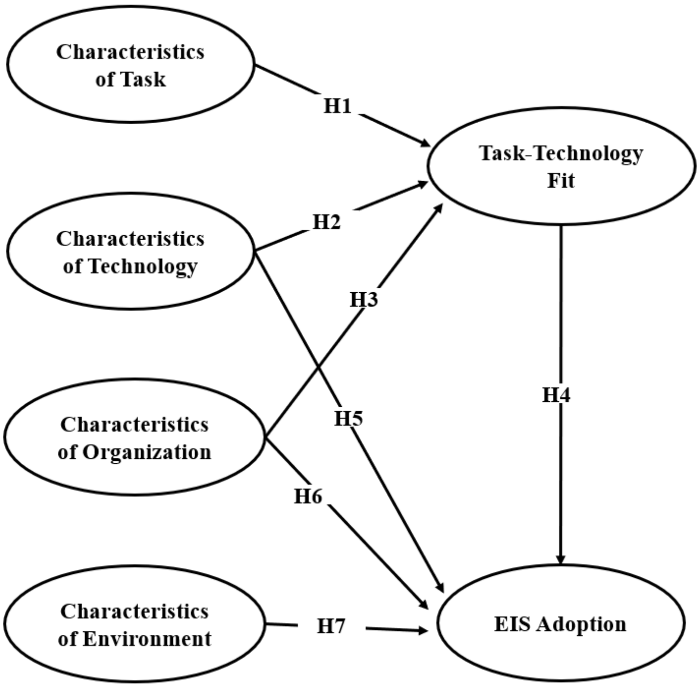

Figure 1. Research Model

Data Collection and Analysis

We analyze the questionnaires collected for this research and describe the analysis findings using sampling and descriptive statistics, reliability and validity, model evaluation and hypotheses testing, and effect analysis.

Sampling and Descriptive Statistics

The questionnaire survey was distributed through online and paper, totally 250 copies. The period of distribution was from November 01, 2018 to March 31, 2019, and 96 samples were actually collected. The response rate was 38% and the effective sample was 77. After the research data is recovered, the sample analysis is executed by SPSS and Smart PLS2.0, including the narrative statistical analysis, reliability analysis, validity analysis and the verification of hypothesis.

Next, about the industry of the enterprise in this study, mechanical equipment and mechanical components manufacturing industry accounted for the most, 19.5%. The number of workers is mainly 101-500 people, accounted for 32.5%. Then, the majority of company's three-year average turnover is 1 to 10 billion NT$, accounting for 31.2%. The company's current capital is mostly 1~10 billion NT$, accounting for 35.1%.

As for the respondents' data, most people are working in chairman's office, general manager's office, and planning office, accounting for 27.3%. Their profession were mainly commissioners and engineers, accounting for 27.3%. The education level of them accounted the most is graduate degree, accounting for 57.1%. The seniority is less than 5 years, accounting for the most 35.1%.

In this research sample, the enterprise information systems are mainly used in enterprises for 1 to 5 years. The types enterprise information systems are mainly enterprise resource planning (ERP), followed by manufacturing execution system (MES) and product data management (PDM). Then, the main system service providers of enterprise information systems are Dingxin computer, followed by Oracle and SAP.

Reliability and Validity

The reliability-validity analysis is measured by examining the factor structure and internal consistency of each potential variable. The factor load of each question must be higher than 0.5, and it can be selected to the main component of the dimension (Hair et al. 1998). Composite reliability indicates the internal consistency of the potential variable, and the coefficient value should be higher than 0.7. In the study, all the dimension's Cronbach's α are greater than 0.7. Then, all the dimension's CR values are greater than 0.7, indicating that the study's dimension represent great stability and internal consistency.

About the discriminant validity, average variance extracted (AVE) is a measure of convergent validity, and its value should be greater than 0.5. Discriminant validity is used to see if the correlation coefficient of the two facets in the latent variable correlations is less than the root value of AVE (Fornell and Larcker 1981). The root value of each variable of AVE in this study is greater than the correlation coefficient between variables (Cross Loading), indicating that the variables in this study represent great discriminant validity.

Model Evaluation and Hypothesis Testing

The hypotheses were examined and aggregated in Figure 1 and Table 2. After examining the hypothesis by using SPSS and Smart PLS, some of the hypotheses were supported (Table 2). The results are illustrated as follows.

Table 2. Results of Hypothesis Testing

Hypothesis		Relationship	Path coefficient	t value	Results
H1	Characteristics of Task → Task-Technology Fit	+	0.181	8.106(***)	Support
H2	Characteristics of Technology → Task-Technology Fit	+	0.406	13.466(***)	Support
H3	Characteristics of Organization →Task-Technology Fit	+	0.400	16.726(***)	Support
H4	Task-Technology Fit →EIS Adoption	—	-0.017	0.468	Not support
H5	Characteristics of Technology → EIS Adoption	+	0.279	11.217(***)	Support
H6	Characteristics of Organization → EIS Adoption	+	0.078	3.045(***)	Support
H7	Characteristics of Environment →EIS Adoption	+	0.336	15.595(***)	Support

Task-Technology Fit (TTF) Model including characteristics of task and technology, characteristics of technology has significant impact on task-technology fit, which is the same as the past reviews about the task-adaptation for tasks and technology (Cooper et al. 2000; Goodhue 1988; Goodhue and Thompson 1995; Rivard and Huff 1988). It means when the technology used by the organization can support and assist users in completing tasks, it can help organizations to accomplish tasks more easily (Goodhue 1988). Therefore, the users of the enterprise information systems really care about whether the information system can assist them to complete the complex task. When the complexity of task is high, the enterprise information systems can help the user meet their needs, and the task-technical fit degree is better.

In TTF, characteristics of organization have a significant effect on task-technical adaptation, showing organizational innovation culture, cognitive financial resources, executive support, capabilities of information department, capabilities of users and users' support will increase the task-technical fit degree. The result is similar to the past research that the more compliant the technology and characteristics of organization are, the better competitive effect will be, which makes it easier to reach the overall goal of enterprises (Delery and Doty 1996; Ruekert and Walker Jr 1987; Snell et al. 1996).

TOE including characteristics of technology, organization and environment have significant positive effect on the adoption of enterprise information systems and also indicate that innovation culture, cognition of financial resources, executive support, the capabilities of IT department, and the capabilities of users possibly affect enterprise's adoption on EIS. Then, imitation pressure, mandatory pressure and normative pressure in characteristics of environment also positively affect the adoption of EIS. The above results are consistent with the past literatures (Bajwa et al. 2004; Hwang et al. 2004). According the result, executive support and the capabilities of user in characteristics of organization have higher path coefficients for adopting enterprise information systems. The possible reasons are that enterprise information systems are expensive, which causes more influence on the operation of enterprise. Therefore, it is very important that the executive in the enterprise support the adoption of EIS. Besides, the operation of the enterprise information systems is relative difficult, so the ability of the employees on operate systems will also affect the adoption of the enterprise information systems.

Conclusion

This research collects relevant literatures of enterprise information systems, filtering and organizing the documents into a table, which assists understanding the scope of the evolution and discussion of enterprise information systems. Then, most of the previous studies have explored and analyzed in the field of ERP for a long time (Moon 2007; Shehab et al. 2004). However, this study uses the TTF and TOE to explore the smart manufacturing enterprises' adoption on EIS from the overview perspective of EIS.

Implications

This study uses TTF and TOE theory to explore the factors of enterprise information systems adoption, providing a more complete discussion of the factors affecting the adoption of enterprise information systems including the internal factors and the external environmental factors. Regarding to the adoption of the factors, the complexity of the characteristics of task and the characteristics of technology can be used to predict the task-technical fit. Moreover, the characteristics of technology, characteristics of organization and characteristics of environment will affect the adoption of enterprise information systems, which are consistent with the past research. The research findings also provide a comprehensively perspective to view the enterprise system research issues and development direction for scholars engaging in relevant research.

This research provides the development direction of adopting enterprise information systems to assist the business's development. With the rapid change of information technology, enterprises adopt enterprise information systems to enhance their competitiveness. Then, with the trend of smart manufacturing, enterprise information systems have become an important tool in the smart manufacturing process. The characteristics of task and characteristics of technology of the system can predict the task-technical adaptation. The more the characteristics of technology of the system can help users complete the task, the higher the task-technical fit will be, which provides a reference for the development of smart manufacturers. To sum up, this study will assist enterprise systems planning and decision-making for smart manufacturing implementation.

Limitation and Future Work

The restriction of this study is about data collection because the objects of the research are enterprises, the questionnaires of whom are not easy to acquire. Furthermore, the content of the questionnaires is possibly difficult for the employees to answer. Above problems may affect the results of final analysis. In terms of the time horizon of the study, this study belongs to cross sectional research, so it lacks long-term data to deeply explore the factors and the trends of problems on EIS. Therefore, it suggests that future research on smart manufacturing and enterprise information systems can target at different levels of enterprises' workers. In terms of time scale, research time can be extended to collect data for a period of time for analysis. In terms of industry, it suggests that conducts research on a specific manufacturing industry to explore the relationship between manufacturing industries and enterprise information systems. In the future, when exploring the factors of adoption of EIS, it can also extend the factors discussed in this study and expand the factors that influence the adoption of EIS.

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