

RESEARCH ARTICLE

An empirical study of project management in Chinese entrepreneurs

Wang Xiaoyang¹, Roshayati Abdul Hamid², Noor Azuan Hashim³, Lokhman Hakim Osman⁴

Faculty of Economics and Management, Universiti Kebangsaan Malaysia, 43600 UKM, Bangi Selangor, MALAYSIA

* Corresponding author: Wang Xiaoyang 1065204659@qq.com

ABSTRACT

The purpose of this paper is to study how project management contributes to the improvement of business efficiency in China, since project management apply a series of scientific management theories and methods which can plan and organize the project in advance and ensure the maximization of the value of resource utilization. Through a face-to-face survey or questionnaires of 132 Chinese entrepreneurs, the survey results reveal that most of the entrepreneurs in this study believe that project management is the management model of the future business. In other words, they believe that entrepreneurs have to learn and master the theory and method of project management, because project management can help entrepreneurs better run their enterprises and make business decisions. Our findings show that the application of project management in Chinese enterprises is still in its infancy. The implications of project management capability and policy making are also presented.

Keywords: project management; entrepreneur; business decision; project management capabilities; institutional dilemma

1. Introduction

In an irregularly market environment, the enterprises' operations tend to project-oriented gradually, and more and more enterprises adopt a new model of project management. It has become the focus in the permanent organization that how to built the management capabilities based on project management ^[1]. At present, the complexity and difficulty of projects are gradually increasing, and more and more scholars study project complexity, because it involves the difficulty of project management and the probability of project success. On the one hand, project complexity will also affect the progress of the entire project, risk occurrence probability and control, as well as the completion time of each sub-project and the overall project, the cost of the project and whether the project can be delivered in high quality. On the other hand, complexity will have higher standards for the professionalism, knowledge, work experience, work ability, communication ability and ability to deal with emergencies of project members and project management ^[2]. In the early research on project management, scholars put forward the basic content and related elements of project management. With more academic research and practical application of project management, the relevant knowledge of project management is constantly expanded and improved ^[3,4]. Researchers' research on the theory and practice of project management plays an important role in the specific application of project management and improving the efficiency of project ^[5]

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Project management is also very important for the product development of enterprises. It takes product development as a project to carry out scientific and effective management, formulate actual project objectives and implementation plans through research, and recruit team members who meet the needs of the project to promote the successful progress of the project. Assessing and quantifying its value has been a major exploration in the previous literature ^[5]. This also proves that project management which is an advanced and scientific management method can become a way for organizations to improve project efficiency, promote project success and improve project delivery satisfaction ^[6,7]. However, due to the lack of project management theories and methods, the insufficient competence of the project manager, institutional dilemma and other factors such as project members often fail to effectively communicate, share knowledge, and coordinate can lead to the failure of the project in China ^[8,9]. In spite of the fact that many enterprises are more inclined to conduct business management through project management methods and theories ^[10], few scholars have studied the use of project management in Chinese enterprises. Therefore, this paper is going to study these issues which are the current situation of project management in Chinese enterprises, the degree to which these entrepreneurs apply project management to their business. In other words, the objectives of this paper are:

- i) To evaluate the degree of awareness and knowledge of project management among Chinese entrepreneurs.
- ii) To explore the effect of project management among Chinese entrepreneurs.

The organizational structure of this paper is as follows: Section 1 is the introduction of the paper, and section 2 is the literature review. The next section presents the conceptual framework of this research; The following section 4 is about the research methods. Section 5 presents the findings and discussion. Finally, the last section gives the conclusion and enlightenment of this study.

2. Literature review

Project Management

Project management is the application of relevant methods and tools to improve the management, control, and efficiency of project engineering ^[11]. The Project Management Knowledge Manual (PMBOK) identifies five implementation processes of project management: project initiation, planning, execution, monitoring and control and completion. It also identifies 10 knowledge areas of project management: project integration, project scope, project time, project cost, project quality, resource management, communication, risk management, procurement, and stakeholders.

The study of these processes and knowledge has played an active role in promoting the practical application of project management. At the same time, the knowledge connotation of project management has been enriched, which is more suitable for the specific application of current project management with the development of technology. Meanwhile, scholars' research and exploration of these issues have also strengthened the connection between theoretical knowledge and practice of project management ^[12]. At present, the number of articles on project management from different perspectives and different fields is also increasing.

In addition, some scholars believe that strengthening employees' awareness of the importance of project management is also very important for the implementation and successful delivery of projects ^[13, 14, 15]. Some researchers have also pointed out that it is necessary to study other fields such as sustainability ^[15, 16, 17, 18, 19] and the connection between sustainability and different aspects of project management ^[20, 21]. Finally, some scholars pointed out that the ability of project managers is also very important for the successful completion of projects ^[20, 22].

Project management capabilities

It refers to the different factors guaranteed by an organization which include companies and non-profit institutions to achieve the predetermined objectives when they conduct projects or work with more distinct project characteristics. Project management capabilities has three characteristics, the first one is relativity which means project management ability is relative, not absolute. An enterprise's project management ability must be compared with the industry environment and its competitors^[23]. Secondly, project management ability is the objective reality. Although we may not be able to see which degree the management ability of an enterprise is superficially, we can find the characteristics of the existence and level of this ability from many angles. The third one is synergy. Project synergy capability, also known as multi-project collaboration ability, is the ability to manage multiple related and parallel projects. It is an effective theory and tool to help realize the combination of projects and enterprise strategies^[24]. The focus of project collaborative management is to ensure that the project manager and other management personnel of the enterprise know the same goals timely, so that different projects can be coordinated and promoted, and at the same time maximize the allocation and use of resources. The full utilization of resources is the key to project collaborative management, which includes not only the personnel, funds and facilities needed in the project implementation process, but also the knowledge created in the project^[25]. In addition, it is often the case that the project manager conducts several projects at the same time, and the team members also work on multiple projects at the same time, dividing their time among multiple projects. This requires enterprises to carry out comprehensive cross-organizational, cross-regional and real-time collaborative management within the project team and between different projects, so that they can finish the project efficiently and with high-quality and low-cost^[26].

Project management and entrepreneurs

In developing countries, there will be certain fluctuations in the practical application of project management, which is also determined by the characteristics of productivity in these countries^[27]. Because different projects have different characteristics, this requires project manager with comprehensive ability. A large number of empirical and theoretical studies are being conducted to study the capabilities required for project managers to implement different projects. Currently, the labor market is changing, which is also a new challenge for project managers. Therefore, some scholars have proposed that the project manager plays a crucial role in the successful implementation of the project, and it needs to have the ability to control the overall project^[28]. These required capabilities are well known to the project management industry. However, it is urgent to build a perfect and comprehensive project management capability framework, which covers all the capabilities that project managers need to have as far as possible. Secondly, with changes of the social and market environment, the ability of the project manager should be constantly developed and enhanced. Comprehensive project management skills are important for both professional application and academic research. And strong project teams should establish a management structure framework that integrates functional elements, capabilities, and job responsibilities into this system framework in order to better ensure the successful delivery of the project^[29]. The main function of the project team is to participate in the organizational decision-making process of the project. In the whole process, the project manager's comprehensive coordination ability, professional and technical ability is particularly important.

The project manager is regarded as the person who plays a central role in the project management process and plays a crucial role in the success of the project^[30]. The project Management capability Development framework defines the competence of the project manager as the ability of the project manager to use his/her knowledge, ability and work experience in the process of project implementation, so as to promote the successful completion of the project and meet the requirements of different stakeholders^[31, 32]. However, Silvius and Schipper^[17] put forward Project management capabilities play a positive role in the success of an

organization's projects. The project manager's ability to control risks is also very important ^[33]. According to Ekrot, Kock & Gemünden ^[34], they introduce the competencies that project managers in different industry sectors must possess for project sustainability.

Project management and entrepreneurs in China

The development of project management in China originated in the early 1960s, when professor Hua Luogeng introduced and promoted network planning technology and combined it with the social and economic development of China at that time, this technology was called "planning method". Hua Luogeng organized and led a team to promote and apply this method in key engineering projects, and achieved good economic benefits ^[35]. With the popularization of modern management methods in China in the 1980s, more and more organizations began to adopt comprehensive planning methods in the process of project management ^[36], which lead to the project management theories and methods used by construction engineering and national defense engineering in China. However, with the development of social economy, science and technology, market competition has become increasingly fierce, and more and more industries have begun to adopt project management. Such as software development, technology research and development, machinery manufacturing, cultural communication, smart tourism, iron and steel forging and other fields of enterprises have also begun to adopt the management model of project management ^[37]. Everything can be seen as a project, and project management is considered by many entrepreneurs to be one of the most advanced management methods and techniques at that time, and it is essential to promote the development of enterprises and all walks of life ^[38]. At present, China has invested trillions in various projects, covering almost all important areas such as economy, culture, science, education and national defense ^[39].

Today, the areas, types, funding sources and currencies of project investment are different, and management is more complex than ever. According to statistics, up to 50% of an organization's work is carried out according to the project management model, in the aspects of new product development, marketing, technology upgrading, production process, sales method and so on, the enterprise adopts project management to upgrade the management of the entire enterprise and optimize each process, so as to enhance the management concept and operation mode of the enterprise ^[40]. In the project practice of enterprises, the use of work breakdown structure chart, network technology, critical route method and other advanced project management techniques and methods have achieved some results. However, China's project management level still lags behind most countries in the world, and there are some problems in the project management practice of enterprises to be further solved ^[41].

3. Conceptual framework

Project management is considered as an important factor for the performance of the enterprises. To find a framework suitable for this study, we examined a range of business performance literature. Among them are Meyer and Rowan's ^[42] institutional theory, Hatefi et al. 's ^[43] the fuzzy inference system method, Ou et al.^[1] model of management by Projects (MBP), Ansari et al.^[44] practice variation theory, Chen^[46] established a four-way game model with project implementation, supervision engineers, project managers and government regulators as stakeholders, and conducted quantitative analysis through the game matrix to study the elements that constitute building safety. Feng et al. ^[47] established a game model among the state, government safety supervision departments, general contractors and other major regulatory entities in order to conduct research on China's construction safety supervision. In the early research on project initiation, intention is very important for project planning; Ajzen^[48] proposed perceived behavioral control (that is, the perceived difficulty of the project one wants to work on) as an antecedent variable of intention and behavior. At the same time, this

variable is the individual's perception of external factors that promote or diminish their ability to perform a certain behavior^[48].

Institutional theory has been used by many researchers to study how does structure become the authoritative norm of social behavior ^[42]. It has been used by many scholars to study the formulation, implementation and enterprise development. Institutional theory reveals that when enterprises are faced with fierce market competition, many factors will affect how managers make decisions, namely: 1) Current situation of system^[49]- the existing system and the implementation of the system; 2) institutional dilemma ^[50] -problems existing in the current system; 3) System improvement ^[51] - the problems of the current system need to be improved and the enterprise system needs to be adjusted in order to adapt to the fierce market competition. Those three variables ^[49, 50, 51] are going to be considered in this paper to realize the importance of institution towards the development of project management.

Figure 1 shows the conceptual framework of the study.

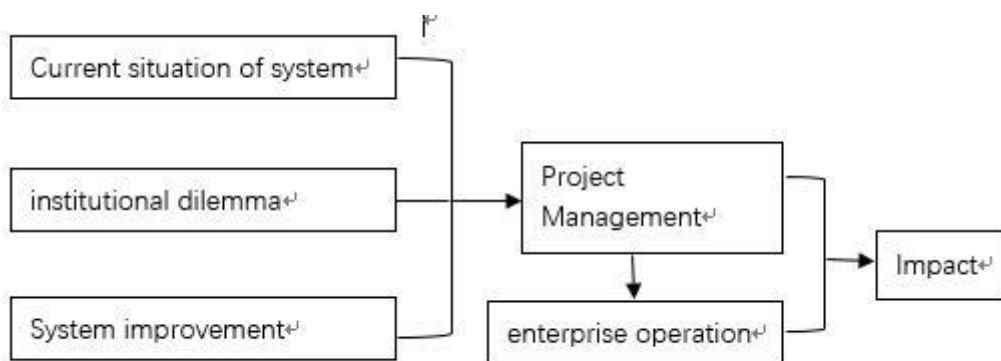


Figure1. Conceptual framework of the study

The framework (**figure 1**) in this study to elucidate the related matters of project management system in enterprises: 1) the current situation of system about project management; 2) institutional dilemma of project management; 3) What aspects of the project management system still need to be improved.

4. Methodology

This study employs a explanatory survey design with the aim of examining project management in Chinese entrepreneurs , taking into consideration current situation of system, institutional dilemma, system improvement. This study uses non-probabilistic sampling techniques, i.e. the selected firms are those with easy access and expressed willingness to participate in the study. The sample includes different types of enterprises in different industries ^[52]. The advantages of non-probability sampling, such as low cost, short time and high efficiency, are becoming more and more popular in sampling investigation ^[53]. Different methods were used to collect data in this paper, such as face-to-face interview, questionnaire survey. These survey were conducted among entrepreneurs in South China. Face-to-face surveys are characterized by interviewers visiting or meeting respondents so as to conduct interviews. The interviewer reads out the questions and records the answers ^[54]. The questions mainly include the following three categories: firstly, background questions: mainly refer to the personal information of the interviewee. For instance, gender, age, ethnicity, education background, marital status, etc., and sometimes also include their family conditions, such as family population, family income, etc. Secondly, objectivity: it refers to the events or actual actions of the respondent that have occurred, exist or will occur. For instance, "Have you ever been rewarded or punished by the current corporate system?" Thirdly, Subjective question: It refers to the subjective world condition of the interviewee in terms of thoughts,

emotions, attitudes, wishes, etc. For instance: "What do you think of the current project management system within the company?"

In both face-to-face interviews and questionnaires, all the question settings were non-motivating, and respondents were allowed to answer the questions as they wished, taking an average of 30 to 50 minutes per respondent. Besides, unresponsiveness and potential bias in surveys are highly likely to lead to erroneous conclusions and thus misleading information ^[55], and the use of biased results in subsequent research may mislead policy formulation and cause damaging consequences. Therefore, when searching the literature, this study tried to expand the scope of search to include studies with different views, variables and results, not just those that support the hypothesis of this study. When planning the study, we pay attention to potential biases that may occur at all stages of the study, especially sampling and effect size, and invite professional scholars to help review the study plan and study data to minimize the risk of non-response bias and potential bias ^[56].

5. Findings and discussions

Respondents' profiles

All respondents are engaged in project management or related work in enterprises should have at least one year's work experience. Both structured and open questionnaires were used. A structured questionnaire is a set of pre-set questions that ask respondents to choose an answer from a pre-determined list. This type of questionnaire is useful when collecting quantitative data because it provides standardized answers that are easy to analyze and compare. Open-ended questionnaires enable respondents to provide more personalized and detailed responses. This type of questionnaire is useful in qualitative research since it makes participants to express their thoughts and feelings in their own words.

Table 1. Respondents' characters (n=132)

Age	Proportion	Major	Proportion
21-25	1%	Management Engineering Others	46% 34% 20%
26-35	63%		
36-45	25%		
Above 45	11%		
Gender	Proportion	Education	Proportion
Male	68%	Junior Bachelor Postgraduate	44% 39% 17%
Female	32%		
Ethnicity	Proportion		
Chinese	98%		
Others	2%		

From this table, it can be seen that there are two important distributions- Gender and major. It is obviously showed that most respondents were man. In terms of major, 44% of respondents are majoring in management, 34% are majoring in engineering, and 20% are majoring in other majors, these means that considering the high pressure and workload of project management work, men are more engaged in project management work. Moreover, from the view of professional pairs, the proportion of personnel with management background is larger, because project management requires certain basic knowledge of management, which is convenient for project managers to better engage in management work. The foundation behind project management is the application of management in the project, and managers with management discipline background are more convenient to use specialized knowledge, skills, tools and methods, so that the project can achieve or exceed the set requirements and goals through risk control under the limited conditions of limited resources.

The importance of project management

Project management is very important for the implementation of enterprise strategic objectives. Poor project management may lead to a series of adverse consequences, such as: project cost overruns, project failure, loss of customers, loss of market share, corporate revenue and profit affected. The operation and management of enterprises, especially the operation and management of project-based enterprises, carry out a series of measures to complete the operation and management objectives. These initiatives are either projects or sets of projects, and the benefits achieved by these projects or sets of projects are consistent with the strategic objectives of the enterprise, thus further contributing to the realization of the strategic objectives of the enterprise. Based on these factors, respondents were surveyed about the importance of project management, and the results are summarized in **Table 2**.

Table 2. The importance of project management (n=132).

Very important	Important	General important	Unimportance
36%	43%	13%	8%

As can be seen from the table, 79% of the respondents believe that project management is important or very important to the operation and development of the enterprise. While conducting the survey on the importance of project management, we also investigated the proportion of enterprises that adopt project management-related systems or methods for enterprise management, as shown in **Figure 2**.

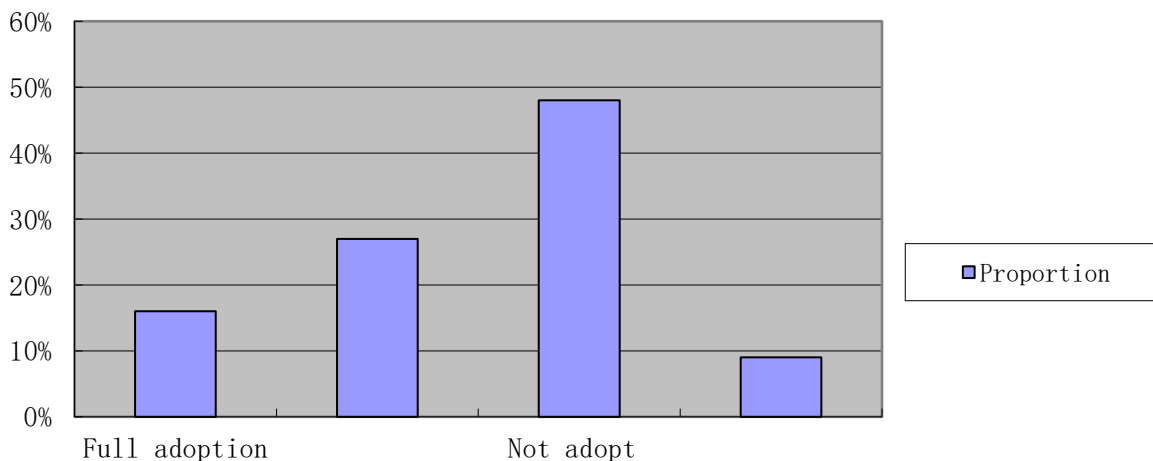


Figure 2. The proportion of enterprises using project management system or method in the process of operation .

According to Table 2 and **Figure 2**, a key issue can be found. Although 79% of the respondents believe that project management is important or very important to enterprise management, due to the professional background of practitioners, the knowledge of project management and various problems faced by the enterprise's own operation, etc. Only 43% of enterprises adopt project management system or method in the process of operation. It can be seen that most managers believe that project management is important for enterprises through the analysis. Therefore, enterprises can clarify management objectives through comparative analysis of the current production and operation status, and make reasonable arrangements for participants according to the project workload and work schedule, optimize the personnel allocation structure,

and establish a feasible quality assurance system. Thus, a set of scientific and reasonable management methods are formulated to ensure the smooth development of the project.

Project management orientation

Among the respondents who adopted the project management system or method, the project management orientation was investigated, including project scope management, project time management, project cost management, project quality management, project human resource management, project risk management, and project integration management. The specific proportion is shown in **Table 3**.

Table 3. The proportion of project management orientation

Project management orientation	Proportion
project scope management	5%
project time management	19%
project cost management	35%
project quality management	24%
project human resource management	11%
project risk management	2%
project integration management	4%

In terms of project management preferences, project cost management, project quality management and project time management account for a relatively high proportion. For example, 35% of respondents are more serious about project cost management, 24% think project quality management is important, and 19% think project time management is important. These respondents believe that many small and medium-sized enterprises have limited funds, and they want to maximize profits as much as possible under the circumstances of limited funds, so project cost management is very important. On the other hand, many enterprises test quality survival, quality is also the focus of consumers, so the project quality management is particularly important; Finally, the ability to deliver products within the specified time is the key to influence the reputation of enterprises and enterprises, so some respondents believe that project time management is also more important.

Therefore, if managers want to do well in project cost management, they must have a clear direction of effort and assessment standards, only clear project cost management objectives can make managers have a direction of effort and assessment basis of the project cost management. Each project needs to determine the standard of project cost management before the implementation of management, so as to control and manage the entire life cycle of the project, rather than simply carry out simple accounting cost accounting after the end of the project and take into account other aspects such as project time, quality, human resources and other aspects of management at the same time.

6. Conclusion

Based on the above findings, we can summarize the project management situation of Chinese enterprises. On the positive side, more and more managers begin to realize the importance of project management for optimizing enterprise management, improving production efficiency and profits of enterprises, and also realize that the purpose of project management is to make the organization conduct efficient, high-quality delivery of projects and make customers satisfied, and at the same time, based on the needs of stakeholders, formulate requirements to engage in project process management to better achieve the desired results. Although project management begins with the project, its focus is more on management. In addition to some framework methodology, project management will be linked with many other factors, so it is particularly important to

coordinate and consider. Besides, through the implementation of project management, enterprises integrate the necessary processes, systems, personnel, finance, tools and systems to form a set of effective management methods, which will be conducive to promoting the change of enterprise processes, systems, personnel behaviors and management models, so as to improve, enhance and feedback in a smaller unit organization. Project members take the project as the unit to form a unified code of conduct. By standardizing processes and tools, the organization defines and creates a series of code of conduct, which can effectively unify the execution process of each project team, greatly reduce the bloated process, invalid communication and inconsistent results, improve the operation efficiency of the organization and the work efficiency of personnel, and thus promote the overall reform of the enterprise. Achieve multi-directional benefits, and ultimately achieve the strategic goals of the enterprise.

However, project management of Chinese enterprises still lags behind to some extent. For example, there are still some managers who are not aware of the importance of project management and the management system is not perfect. At the same time, some enterprises have not established internal management systems, including technical management, cost management, financial management and material management, in accordance with the requirements of project management. Cost control is not strict enough. Technical managers lack relevant management experience and can not use project management methods to manage the process well. Therefore, the following three optimization methods are proposed. Firstly, when selecting project managers, talents with management knowledge background or management experience should be selected as far as possible. Secondly, it is needed to further optimize the project cost management, determine the standard of project cost management and set the project cost control indicators, including: total project cost, labor price level, material price level, and management fee. Thirdly, the managers should optimize the training of internal employees so as to improve their mastery of project management knowledge and technology.

Although we collected data and analyzed the current situation of project management of Chinese enterprises and the aspects that need to be optimized, the data collection is not comprehensive enough. Meanwhile, the specific factors of the impact of project management on the performance of Chinese enterprises need to be further studied

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Conflict of interest

The authors declare no conflict of interest.

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