AIS Evaluation Research

A thesis submitted to the Rotterdam Business School in partial fulfillment of the requirement for the degree of master in Finance and Accounting

Case study of Qiaofule Grain Trading Co., Ltd. in evaluating and improving its accounting information system

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October 2013
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Executive summary

This thesis report was prepared to fulfill the requirement to apply the master degree in Finance and Accounting from Rotterdam Business School. The author of this research was delegated by a small Chinese company to evaluate the performance of its currently employed accounting information system (AIS); then, help them explore the underlying problems and provide recommendation to improve its AIS.

The research focused on three aspects, the evaluation, the underlying dominations and the method to improve the AIS. Wherein, the evaluation was the main body of this research and it was assessed from four angels – effectiveness, efficiency, reliability, and continuity. Wherein effectiveness examines the system objective achievement, efficiency examines the IT application and the duplication in data processing procedures, reliability assesses its compliance on related regulations and the continuity looks over the flow of information.

Based on this definition, the evaluation was conducted with a pure focus on the system itself. Relative literatures and empirical findings are collected. Based on these evidences, the evaluation outcome shows that the current AIS has relative good performance in effectiveness (7/10) and efficiency (7.86/10). However, its reliability (2/10) was seriously questioned as the outcome of this system is only for internal control and cannot fit to the accounting standards exactly. The problem in task segmentation, internal communication, and the functional structure also restricted its continuity (5.5/10). Although the efficiency seems to be good, this is from avoiding the system problem in the multiple-user condition by simply using one terminal with two users. In reverse, this triggered other problems in communication and restricts the business growth. As a result, the main research question was answered based on the scores for the four angles. The system achieved a 55.9 as its final score from the evaluation. It was assessed as not sufficient to support the extension and transformation of the company, and is possibly need to be replaced.

Meanwhile, to have a deeper insight of the causes of the poor performance of the current AIS, the author review the literature in other influences on the performance of AIS, and collected relative empirical findings based on its instruction. These evidences revealed the underlying problem in the normalization within the company, the top manager’s knowledge in business management, the organization structure, the integration of different functional fields, the applied information technology, and the related personnel.

At the same time, the method for developing the AIS is also consistently reviewed and proved within the research. Based on the good condition of the commercial AIS package in Chinese market and the financial encouragement from Chinese government, the author recommend the company to replace the current AIS by
installing a new one. This is also the way to completely resolve the system problem in its low efficiency in multiple-user conditions.

Other recommendations also provided, based on the conclusions about the problem in other dominations.

One certificated accountant was advised to be owned within the company. This can normalize the accounting system; and integrate the function of internal and external financial reporting within one complete AIS, but not by purchase some extra services. In addition, hiring an accountant can enhance the accounting function within the company, and set more labor free from the massive accounting data. The saved labor can support other functional filed and in return enhance these functions. The load of the top manager was also expected to reduce. The task segmentation will also be more logical allocated.

The top manager was advised to be educated in business management. This is for increasing the management ability of the top manager. Then it was expected that the company’s soft power can be apparently increased by developing the knowledge and skills of the top manager. This might not have obvious influence on its AIS; however, from long-term, this will increase the support from the top manager on the development of the internal management system.

At last a kindly learning system and well-defined training system are also recommended to Qiaofule Company, as a way to increase its employees’ quality from a sustainable view.

To confirm the research go successfully, the research was carefully designed with Saunders’ research onion as basis. To achieve the relevant data, the author applied interview, observation and documentation as the data collection techniques. The data quality was also examined from both the validity and the reliability. These tries are for confirming the quality of the research outcome, and showing that the ability of the author can achieve the level of master in Finance and Accounting.
Chapter 1 Introduction

1.1 Chapter introduction

This chapter is aimed at giving basic information to readers. This will cover the introduction about the research company, research problem definition, identified research questions, and the reasons for making these particular choices. At the end, an outline is also prepared for showing the framework of this research.

1.2 Background

1.2.1 Company background

Qiaofule Company is a small family business which established in 1995 and started with four employees at the initial. The owner, Mr. Zhao, started his business by purchasing, delivering and selling gains and edible oil as a wholesaler. He and his younger brother established their own grain brand “Xianglanxiang” in Heilongjiang Province, which is responsible for purchasing rice in North China and making the primary selection. Since 2007, Mr. Zhao isolated the business in Tianjin as the biggest sales agency of “Xianglanxiang” Rice in Huabei Region.

In 2006, to save the warehouse cost, Mr. Zhao established his own forklift team at NC freight train station; then gradually extended his business as a 3rd logistic party. Now he owns 9 forklifts and 7 freight cars, and got the contract from NC freight station for the complete stevedoring work on the platforms. Meanwhile, Qiaofule Company strengthened the long-term cooperation with big institutions, like universities and government organizations, on one side; on the other side, it started the business in bidding grains from government projects to extend the source of stable supply.

Until now, Qiaofule Company has developed to a stable company who has owned about ten employees and whose annual sales volume has exceeded twenty millions RMB. Next step, the owner planned to bring a new idea into the Chinese grain market. Through a series of actions, Mr. Zhao wants to establish the brand image, expand market and achieve a sustaining increment of profit by adding more value to the goods for sale. This tends to bring a revolution within the company; therefore, to better welcome the coming blizzard, the entire company is striving to be fully prepared.

1.2.2 Industry background

Based on the report of China’s grain industry in 2012-2012, China's food industry is on
the basis of state-owned grain enterprises; foreign joint venture, wholly owned companies and private enterprises coexist. To ensure the national food security, the government coordinated food import and export from the whole plan; meanwhile, the state-owned grain enterprises play a role of main channel in the field of food procurement, processing, logistics. Since 2005, the Chinese government proposed accelerating the industrialization of grain business; domestic grain enterprises has been exploring the way of convention from the traditional model (purchase raw grain and sell raw grain) to industrialization model (form scale and build the own core competitiveness). However, within the more than 80,000 grain enterprises in China, only seldom has implemented the transformation. Most enterprises still face the problem in single business model, limited variety of products, small brand influence, low profit margin, and low level of industrialization. This is very dangerous for the company's survival, especially for the small private enterprise that is hard to resist risks from external environment and is more vulnerable to external market impact; when the international grain enterprises quicken their steps into the Chinese market.\(^1\)

On the other side, although the consumer market of grain shows a continuous increasing trend; the need of residence for the grain ration was continuously decreasing in the past decade.\(^2\) Consumers have higher requirements on the grain taste and food quality. At the beginning of 2013, the government limited the variety of presents in the Spring Festival period. Because of this policy, many markets were adversely affected, beside the grain products market. As one of the few approved gift, different grades of grain products were required by consumer market. However, the diversification of grain products is insufficient to satisfy the needs from different levels. The variety of the products is also limited. There is a lack of well-known brand in wheat and rice. Consumers presented blindness in the process of choosing relative products. In Japan market, the price of rice and wheat are based on the spice and origin place. Consumers can easily choose the required products based on these two remarks. However, this kind of standards is still blank in the Chinese consumer market.

1.3 Problem definition

Following the traditional model for more than a decade, Qiaofule also went to very awkward conditions – increasing sales with shrinking profit. In order to free from this predicament, Qiaofule Company also went on the way of transformation. By developing the storing technique of grain, Qiaofule conquered the problem in keeping grains taste; which is expected to be its core competition. It also extended its business chain by establishing its own delivery team and combining diversified transportation channels. Next step, Mr. Zhao wants to fully take the advantage of his rich knowledge and experience in grain and grain trading, brings the concept of Japan consumption market to Chinese grain ration market, and promotes the new product series to

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\(^1\) 郑志伟. 2013. 实施粮食产业化经营战略 推进国有粮食企业集团化发展. 中国粮食经济, 1.

Chinese market in big cities which are centered on Huabei Region. To achieve this target, several problems are required to be resolved. Generally, they could be grouped into three kinds – family business problems, small business problems, and those directly relate to launch new products.

The first two catalogues are relative historical problems, which consistently accompanied the development of the company. These problems are not the stress of current business; however, they somehow influence the implementation of the business plan. Family business characteristic problems include the quality control of raw materials and financial entanglements. The first one means the lack in quality control of the raw materials from Xianglanxiang Company, who supplies exceeding 70% of the total purchase raw grains. Besides the unstable quality, the amount and categories are also without integrated planning and effective intercommunication. This leads to redundant logistics expense, vain labor cost, cost for under-quality materials, and the other intangible loss. The second problem shows the influence on capital from Xianglanxiang Company. As Qiaofule was once a part of Xianglanxiang Company and there are still a lot business transactions between two companies; the performance of Xianglanxiang has certain effect on Qiaofule Company. Meanwhile, Qiaofule shares the same problem, as the majority Chinese small enterprises, in the excessive pursuit of pure interest growth; at the same time, ignores the improvement of the enterprise. The organization structure and some functions lack an explicit scope. The owner controls almost every detailed decision. This adversely influenced the promptness in catching potential business opportunities and the expansion process of the company. In addition, there is also no systematic mechanism in working capital control and investment decision making.

Compared with the above problems, the company put more attention on preparing the launch of new products. Directly-related problems involve to doing market research, improving products package, identifying sales channels and making advertise. It is also necessary to identify the target brand image and spread the new grain consumption concept into the consumer market. Within the company, function in sales and accounting is required to be enhanced. As a part of the accounting, the company employed an accounting information system (AIS) from the early establishing period (1996). This system was long-time operated without normalized instruction; furthermore, there is no afterwards maintenance, evaluation, and improvement for the system. The effect of this AIS is not accurately defined. To better prepare for the business expansion and fully play the function of this system, the owner of Qiaofule wants to systematically evaluate the AIS and further improves its weakness.

Rather than the historical problems, the owner has more interest on preparing for launching new product and building up his own grain brand image; therefore, he wants to ask the researcher help him resolving problems relevant to enhance the accounting function or research market. In the prospective of the author, the problem which was triggered by the family business character is difficult to intervene; while it is also hard to resolve the working capital problem, as the data from the owner is not
sufficient enough. Considering the major relevancy, the evaluation of AIS might be the most proper issue for the degree thesis in finance and accounting. In addition, well-designed AIS can indeed highly improve the effectiveness and efficiency of company’s accounting activities, and assist the decision making by providing relative information (Bodnar & Hopwood, 2013). It is also the requirement from the system users to evaluate the AIS. Then the owner of Qiaofule Company delegated the author to completely evaluate the AIS that was currently employed within the company.

To confirm that the currently employed AIS could assist the new product launching and enterprise convention, the owner of Qiaofule Company needs to have a clear view of the performance of the AIS and the underlying problem which might influence the promoting of his business plan. As his primary thinking, possible problems can include:

- Because the current employed AIS has been used for more than ten years, its technology application is questioned within contemporary business environment.
- As the previous need of generating information from the AIS is quite limited, the owner wondered whether it could provide sufficient required information in future business activities.
- Launching new product and making enterprise transformation tend to involve new transaction activities that are supposed to be recorded into the accounting system. New requirements and new objectives will also be proposed to the AIS, which are from the needs of changing environment.

The author was delegated to conduct this research to solve these doubts; furthermore, to show an explicit view of the evaluation criteria especially for Qiaofule Company and the performance of its AIS based on the defined criteria. The author will also show the main phases and different method to improve the information system. Based on the evaluation outcome and the instruction of the information developing studies, the author will give the recommendation in further.

1.4 Research objective and research questions

As the definition of the research problem, the goal of this research is to evaluate the performance of the AIS employed by Qiaofule Company in term of the effectiveness, efficiency, continuity and reliability; clarify the underlying problems and assist the company improving its AIS to be better prepared for the company transformation.

Within the statement of the research goal, there are four core research concepts. To make the research target clearer, these concepts should be accurately defined firstly.

Effectiveness - the accomplishment of system objective(s).

Efficiency – the effect in time and labor saving, by applying the target AIS.
Reliability – examines whether the data processing procedures and data outcome obey the relative regulations.

Continuity – reveals the possibility and frequency of the data miss/repeat/distortion in the entire information flow.

Research objective

Evaluate the performance of the current AIS and figure out the underlying faultiness in this system. Based on the evaluation result, try to help Qiaofule Company improve its AIS with limited resources and make it better prepared for the business requirements.

Research questions

Main question
How is the performance of the current AIS which is applied by Qiaofule Company?

Sub-questions

Literature-based questions:
1. What are the main elements in viewing the performance of the AIS?
2. How important are these elements in evaluating the performance of AIS?

Empirical-based questions:
3. What are the main influences to Qiaofule Company’s AIS?
4. How is the effectiveness of Qiaofule Company’s AIS?
5. How is the efficiency of Qiaofule Company’s AIS?
6. How is the reliability of Qiaofule Company’s AIS?
7. How is the continuity of Qiaofule Company’s AIS?

1.5 Report outline

In this part, readers could find an overview of the thesis and the involvement of the author in this research.
Chapter 1 is an introduction about the company background, research problem, reasons for choosing the subject, defined research questions, author’s involvement, and the outline of the thesis. Wherein, the identification of research objective and research problems leads the whole thesis, and directly determines the selection in literature and research methodology.

Chapter 2 reviews all relative literatures that applied into the thesis and the answers for literature-based questions. These theories are also useful in guiding the collection of data and giving recommendation to improve the AIS.

Chapter 3 shows all aspects about the research process to convenience the reader
that this thesis is completed independently and critically. Chapter 3 and 2 together instruct the collection and analysis of empirical findings in Chapter 4; while, the detailed discussions about the relationship between the findings and research questions are placed in Chapter 5.

At the end, the author makes conclusions, answers the questions and provides recommendations to improve the AIS of Qiaofule Company in Chapter 6. To make the connection between each chapter more visible, a thesis outline is prepared as the Figure 1.1 presenting.
Chapter 2 Theoretical framework

2.1 Chapter introduction

In this chapter, readers can find all relative theories used in this research. They are grouped into five catalogues; respectively - basic concepts, AIS viewing model and techniques, influences on enterprise AIS, relative regulations, and AIS development. At the end of this chapter, answers for the literature-based questions are given to restate and summarize the evaluation criteria.

2.2 Basic concepts

In this section, the author will discuss the concepts of AIS, the consensus on the objective of contemporary AIS, its conceptual framework and different varieties, its application of information technology, and the AIS’s application circumstances in China and Chinese small business.

2.2.1 AIS definition and attributes

Differ to the traditional accounting subjects; the accounting information system (also mentioned as AIS) is a new concept. Its emerging was accompanied by the increasing application of information technology into the accounting information management. With the expansion of information systems’ application, currently the AIS is commonly treated as a component of the entire enterprise management information system which is used to optimize enterprise’s resources allocation.

In 1997, Phd. Romney stated, “Accounting information system is a data processing process providing the information that will be needed for the users of information in the business enterprises in planning, controlling and maintaining the activities of business enterprises.” After him, Julie Smith David and her colleagues defined the AIS as “an information system collecting, processing and storing the data related to the economic activities of business enterprises for the parts to make a decision about the business enterprises” in 1999. Both of them defined the AIS from the perspective of an information system; and somehow missed the nature of accounting.

In 2005, Phd. Gelinas, et al. proposed the AIS as “a special sub-system of the MIS... whose purpose is to collect, process and report information related to financial transaction”(2005:15). This is mainly from the perspective of the organization structure and treated AIS as a branch of the entire Management Information System.

From the functional aspect, Wilkinson, et al., in 2006, suggested the AIS as “a unified
structure within a business entity such as business firm that employs physical resources … to transform economic data into accounting information”.

It is impossible to have an universal definition for the AIS, as it can be defined from verified angles. However, most definitions would use some similar demonstrations, which somehow can be seen as its attributes:

- It is a physical existing system which could be operated within computers.
- It shows strong goal-orientation.
- It can replace traditional accounting method in capturing, interpreting, recording, and storing accounting information.
- It can generate useful information to satisfy the requirements from different users.
- It trends to be a subsystem of a complete enterprise information system.

2.2.2 Objective for contemporary AIS

One of the attributes of AIS is that is designed to achieve some goal. In this term, the system objective(s) can be quite essential. However, objective(s) of AIS are diversified, because it should be based on the specific situation of each company. Therefore it is hard to define some unified objective(s) which can be adapted to all AISs.

Moreover, from history, with the development of IT and its increasing application into accounting practices, the objective of AIS is extending and has been given more abundant meanings. These are discussed in Chapter 2.2.4. In this section, the author would show some consensus of the objective for the contemporary AIS.

Many studies about AIS mentioned its objectives. As to the current studies in AIS, almost all of the AIS monographs covered the information support as one of the objectives as AIS (Marshall B. Romney, 1997; Boczko, 2007; Hall, 2008; Bodnar & Hopwood, 2013). After entering the era of information, information was treated as one of the most precious resources to enterprises. Based on the characteristic of time, theories were proposed to assert the task of AIS is to generate required information. However, there are immense varieties of information. Only from the functional aspects, there is information in procurement, production, sales, marketing, HR, finance, and accounting; nevertheless, there are more categories based on more particularly defined natures, roles, purpose, etc. From its content and purpose, the required information from AIS is composed of three parts: financial accounting information, managerial accounting information and financial management information:

✓ Financial Accounting Information

The information in this category is basically concerned with external performance reporting. In term of the nature, it is often retrospective, structured, and externally controlled. In term of the recording content, it focuses on recording, classifying and presenting the financial transactions based on relative regulations.

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✓ **Managerial Accounting Information**
   This category includes the information, concerned with the assist in formulating the corporate strategies and policies. By the support of this king of information, users in different levels can improve the performance in planning and controlling business activities, making decisions, and strengthening the ability of corporate governance. In nature of the information, it is always predictive, unstructured and internally controlled.

✓ **Financial Management Information**
   The last part usually refers to processes that associated with the acquisition of finance, the efficient management and development of both long-term and short-term resources. Primarily, it is aimed at supporting the decision making in investment and financing to achieve the maximization of shareholders’ wealth and the minimization of relative risk.

Although it is important of AIS to provide required information, something is more valuable - how the information can be applied. In this term, both Tony Boczko (2007) and James A. Hall (2008) gave their opinion. Compared with James, Tony analyzed the impact from both internal and external users. Meanwhile, both of them stressed the function of information in making decisions and facilitating control.

Generally, it could be concluded as four integrated objectives (2007,14), which were stated as:
- transaction processing management: to sustain and reinforce organizational operations;
- information management: to support decision making by internal decision makers and ensure the objective transformation of economic/financial data into accounting information;
- internal systemic control: to discharge obligations relating to stewardship and control the acquisition, management and disposal of organizational resources;
- external systemic control: to fulfill legal, social and political responsibilities and encourage alignment with extant regulatory requirements.

Defiantly, there could be more objectives for AIS. As the statement in the beginning of this subchapter, the objective could be varied from firm to firm. In the process of designing, evaluating, maintaining, and developing AIS, accurate definition of the AIS’s objective is very necessary; and it should be in accordance with the specific requirement from the specific circumstances of the target enterprise.

2.2.3 Framework & varieties

James A. Hall proposed a conceptual AIS framework to identify the domains of accounting information system. However, in the designing process, system designers will not accurately blueprint the physical frameworks as the conceptual. Based on his
proposal, there are three major components of AISs - transaction processing system (TPS), general ledger/financial reporting system (GL/FRS), and management reporting system (MRS). Figure 2.1 presents an example of the AIS’s framework within a manufacturing company, the mainframe includes:

- **Transaction processing system (TPS)** supports the daily business operations by converting the economic events to the financial transaction, recording financial transaction in the accounting records, and distributing essential financial information to operations personnel.

- **General ledger/financial reporting system (GL/FRS)** measures and reports the status of financial resources and the changes in those resources by producing traditional financial statements, like the income statement, balance sheet, statement of cash flows, tax returns, and other reports required by law.

- **Management reporting system (MRS)** provides internal management information with particular defined reports and information which is required in the decision making, like the budgets, portfolio analysis report, cost-volume-profit analysis report, and so on.

Wherein, the TPS is the central, as it has the closest relationship with business events. It assists the controlling of the internal organizations in revenue, expenditure and convention cycles.

No matter which AIS cannot escape from these three domains; however, the designed structure can be diversified. Before the extensive application of computer into the accounting processes, the kinds of accounting system includes manual system, automatic system, and computer-based system. With the prosperous of computer-based information system, it is more regular to divide the AIS based on its functional hierarchies. In China’s academic studies, there are three main catalogues under this classification; respectively are Electronic Data Processing System (EDPS),
Management Information System (MIS), and Decision Support System (DSS): (2004: 9)

- **EDPS** – is a fundamental AIS variety, which focus on transaction-oriented data processing. Main tasks include accurately recording, processing and storing transaction-oriented data, and then outputting information with compliance to relative regulations.
- **MIS** – is a development from EDPS, which focus on providing decision-oriented information to managers. The main task is to timely provide necessary and relevant information to the managers to assist their management of business planning and real-time control, according to the data storage and corresponding economic management model.
- **DSS** – is formed by the development of MIS, which is aimed at improving the performance of decision-making for the end users. The core component of DSS is its model library and corresponding method library. The model library reflects the problems that are faced by the decision makers; while the method library provides formats for processing the information and data input. Via this system, the decision maker could simulate the possible scenario in the actual operation, make trials of various schemes and compare the outcomes from different assumption; finally, select the optimal scheme to achieve the auxiliary of decision making.

Besides the classification from functional hierarchies, the varieties of AIS are also divided by application scope, type of organization, or system structure. From its application scope, there are special system and general system; from the organization types, there are industrial enterprise AIS, commercial enterprise AIS, AIS of administrative institutions, AIS of technology trade and service groups, and the AIS of financing institutions; and from the structure, there are single user system, multi-user system, and network system. When an enterprise designs or purchases an AIS, it is better to define the proper variety firstly, based on its own condition.

### 2.2.4 Technology development and application hierarchies

Technology development is one of the main dynamics for the evolution of AIS. From the primary electronics technology to the latter information technology, and even to the most cutting-edge cloud technology, it still encourages new inventions for accounting work. Furthermore, like the previous statement, it even extended the definition of AIS and endowed the AIS more objectives.

**The development of software in accounting**

In 1954, electronics technology was firstly applied into the accounting work through computer-based software by GE Company in their labor payroll processes. This started the electronic data processing accounting. At the beginning, it can be only
applied into the single business processing, like processing labor payroll, and merely be accepted by minority enterprises. After 1965, gradually generate a complete accounting system; which could achieve the general ledger, subsidiary ledgers, financial statements, payroll calculation, and so on.

Since 1970s, decision support systems (DSS) have been emerged. Its appearing helps the predication and decision-making in specific accounting units, for instance, procurement and inventory. In the 1980s, with bringing artificial intelligence into the accounting systems, its function in supporting enterprise’s strategic planning, like sales planning and materials requirement planning.

After 1990s, the concept “network” led the revolution of the integration of the information systems in different functional fields within one single enterprise. Later this requirement was improved to integrate data and information for the internal users and provide required information for the external users. This transformed the traditional isolated AIS into the core component of the MIS, and pursued the invention of relative software like MRP and ERP.3

Models of AIS and application hierarchies

Based on the classification of James A. Hall, there are general five models that represent the five stages in AIS history.

- **Manual process model**

  The manual process model is the most traditional method, which has already been obsolete by the contemporary enterprises, due to its low efficiency and high error rate. Within this model, all accounting tasks are completed by pure manual work, and every process refers to the physical activities. The only possible advantage is its contribution in teaching practice. As to the real business environment, it is apparently not fit any more.

- **Flat-file model**

  The flat-file model emerged in the late 1960s and got popular in 1980s. Now this model is the major representative of the legacy system and tends to be replaced by the database management systems. Its most outstanding character is the isolated environment. Systems with this model provide stand-alone environment to the specific end users. The user can establish files in the independent environment. This shows high file-oriented system feature. As the statement of Boczko (2007: 274), this kind of system “can be extremely cost effective -

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especially if only small amounts of data are stored.” However, because of the isolated environment and file-oriented feature; it can also make constrains in data capture, data processing, data storage, and data integration:

- immense duplications in data capture and data processing procedures;
- serious data redundancy in stored data files;
- higher error possibility in data updating;
- higher risky in data's currency;
- higher cost for satisfying new requirements;
- more limitations in data integration.

These problems limited the flat-file model systems in the 1980s. Data-oriented systems started replacing its place. Now, even the flat-file model is still applied, it can only fit to some small business. If the enterprise did not properly chose the system, this model can even prevent the enterprise from further expanding.

➢ Database model

The database model addresses problems in flat-file model by centralizing the organization's data into a common database, in which information will be available for all authorized users. By pooling the data into a shared platform, there is no need to add additional private data sets. Users will be limited by the access to the data resource, and the special software established for managing the access was named database management system (DBMS). DBMS admits authorized users to achieve the required data from database, and denies those who are not authorized to ensure the security of the organization's data. In this term, the process to assign the authority to users becomes very profound in the data control. Because of its efficiency in data management, data access controlling, data integration; as well as lower possibility in data redundancy, duplicated work and failure/missing operations; the database model was widely accepted by big enterprises.

After the database model, developers move attention from accounting-processing based system into the event based system, and tried to break the traditional accounting method by new information system (IS). Based on this idea, the REA model was proposed, which reveals the next stage of AIS.

➢ The REA model

The REA model was proposed by McCarthy in 1982 in his famous “The REA Accounting Mosel: A Generalized Framework for Accounting Systems in a Shared Data Environment.” However, rather than a physical IS, this model was still kept in concept. This could be reasoned to its challenging to the long-time convention of double-entry bookkeeping method. In spite of the traditional set of
the account data, the REA puts more attention on the economic events and the influence to the enterprise resources, especially the scarce and profound resources. In this term, McCarthy defined the key elements in the REA model:

- resources: scarce objects that are under the control of the enterprise;
- events – the phenomena that affect changes in resources; and
- agents – individuals and departments that participate in an economic event.

Although the REA model couldn’t form a physical AIS; its philosophy was inherited by the ERP, and was accepted by most international big enterprises.

➢ **Enterprise resource planning systems**

Enterprise resource planning (ERP) is an information system model which facilitates the enterprise automating and integrating its key business processes. This system was designed and promoted as commercial products by several major companies like SAP, Baan, and Oracle. They provide a whole ERP package to help company establish the standard processes. Within the system, enterprises’ functional fields can be closely connected via the integrated data management. Because of its stress on the internal resources controlling, the integration of internal control, and the support in decision making; the ERP was currently applied by most big international companies. The competitions in ERP commercial software also become more intense.

**2.2.5 AIS’s status quo in China, especially in Chinese small business**

Although the development of AIS in western countries have exceeded half of a century, its real formation in China is still short. In this section, the author cased the specific situation in China. Besides presenting the emerging and development of AIS in China, the author highlighted the problem faced with the small companies in the application of AIS, as well as the advices from practical prospective.

**Accounting software development and application in China**

Accounting software emerged in China in the late 1970s. Until now, its development in China could be roughly summarized as five stages:

➢ Initiative development stage (1979 ~ 1988)

This is the initial exploration stage, in which enterprises started their cooperation with the high education institutions and relative research centers. The earliest

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research focus on automating the salary calculation processes. However, because of the lack of stable development team, and the accounting personnel’s application level is also limited; most research are ended with failures.

- **Single business processing software stage (1988 ~ 1993)**

  The single business processing software means the accounting software that can only record, calculate and report the individual business unit. Its aim is to reduce the work intensity of accounting personnel and increase the efficiency of accounting work. The first commercial accounting software and the first company who lives on selling commercial accounting software were both born in this period. In 1990, the administration of finance first time approved the accounting software, based on the provisions in the “regulations for the administration of accounting information systems (trial)” that was issued in December, 1989. In the following few years, several software companies, in succession, launched their products which also passed the state inspection; and intensified the competition in the market of accounting software. This marked the commercialization of the accounting software in China.

- **Accounting software stage (1993 ~ 1998)**

  With the commercialization of single business processing software, software companies invested more into the development and accelerated the invention of complete accounting software. This kind of system could conduct the complete accounting treatment and accounting statement output. The modules within this software include salary calculation module, material accounting module, fixed asset accounting module, expenses accounting module, sales module, general accounting treatment module, and accounting statements module. Wherein, the accounting treatment module and accounting statements module are the basis, which can satisfy the general accounting requirements for the small business. However, for large and medium enterprises, it is not sufficient within only these two function modules.

- **Management software phase (1998 - present)**

  Aimed at the limitation of accounting software into the big-and-medium enterprises, management software was promoted. Within this system, enterprise can conduct proactive predication, decision, planning and budget; management and control in processing; and the ex-post facto calculation and analysis. Since this, the function of accounting software was not merely restricted into the field of financial management and accounting operations, but also to reflect and control the physical resources flow in the production and operation.

- **Integration stage of comprehensive enterprise management software (future)**
This is the prospective stage for the AIS development in China. Compared with the AIS in current western counties, such as MRP and ERP, this part is still almost blank in China. However, evidence shows that some big Chinese enterprise has already install the ERP system by purchasing relative commercial packages from the foreign software companies. This shows the needs for the integrated enterprise management software; and infers the development trend of AIS in China.

**AIS application in Chinese small business**

Even though big Chinese enterprises have already paid attention to the application of AIS in the enterprise governance; the situation within Chinese SMEs is not optimistic. The overall application level of AIS in Chinese SMEs is still low. The main function of AIS is still staying in the simple recording, calculation and reporting, which is only used to replace the manual work. The importance of AIS is not recognized by most SMEs. This limits the effect of AIS and prevents the AIS from the deeper application into SMEs. In a study in 2005, the researcher summarizes the underlying problems for this embarrassing situation, from the researches of almost three hundred enterprises which has completely or partially realize the AIS. In his study, he summarized the problems into eight identified items:

- most enterprises have no clear purpose for applying AIS;
- the AIS are simply used for replacing manual work;
- there is no apparent progress in the quantity of processed information simply with the primary AIS
- accounting personnel has no sufficient knowledge about accounting softwares;
- accounting personnel has not been completely liberated from manual habits;
- AIS cannot play full effect in the implementation;
- theoretical research on AIS is divorced from reality
- relative administration and inspection is not valid enough.

Other studies also motioned the limitation, due to the lack of proper accounting software and professionals in system development. However, at root, the low rate of AIS application in Chinese SMEs is a reflection of enterprises’ insufficient attention and understanding on AIS. To positively change this situation, advises were also given by four main fields:

- the purpose of applying AIS
  - clearly indentify the purpose of applying AIS

- the process of application

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- avoid the simple replacement of manual work;
- sufficiently understand the functions of software and fully play the effect;
- enhance the function of finance and accounting department in the enterprise;

➢ the output of AIS
- output from AIS should be more comprehensive than manual system;
- enhance function of accounting statements reporting

➢ regular processing within AIS
- try to reduce the manual work process;
- regular work points should be moved, after realizing the AIS

2.2.6 Motivation

This subchapter is the basis of further illustration. By showing the objective, readers can better know the function of AIS within an enterprise. Through presenting the system framework and variety, readers can have a general idea in system selection. Showing the application of IT within AIS can deepen the understanding of the function of AIS in different levels and the status quo of the AIS’s development in the worldwide. Most important, these form a standard, which can be used to compare the current situation of AIS application in Chinese small enterprises; and provide the understanding of the reason why the performance of AIS is not soundly in real practice from the view of Chinese academic studies.

2.3 AIS viewing model and techniques

In this chapter, the author provides the necessary method for viewing the AIS. This includes one general model in viewing AIS, and a number of techniques in viewing the information flow.

2.3.1 General viewing model and system viewing techniques

Viewing an information system is very complicated. It refers to the identification of variables and corresponding index in the assessment. In practice, no perfect model exists for viewing all ISs. Researchers and designers have to build up the specific model for accurately assessing the performance of the specific IS. In order to allow the non-IT-professionals enter this field within a basic and simple way, a general viewing model was proposed. Regardless the technological architecture of IS, James A. Hall proposed a general model for viewing the AIS applications in his work “Accounting Information Systems” (2008: 10). Figure 2.2 shows this model and the elements in this general model will be extended in the next section.
In addition, to have a deeper insight about the information flows, several techniques can be helpful. They are regularly applied by the system professionals and are applied to make either the physical or the logical connection explicit by interpreting these abstract relations/flows to the visible figures, flowcharts, tables or diagrams. In this term, it is necessary to distinguish the function between different techniques and the unique language used in the visible forms. These are placed in the Chapter 2.3.3.

### 2.3.2 Elements in AIS viewing model

As Figure 2.1 showing, there are nine elements in the viewing model; however, the external sources of data and the internal sources of data can be treated together as sources of data. Similarly, the external end users and the internal end users can together be the one element – end users. Then there are seven elements in total in the viewing model. They are elaborated one by one:

#### End users

As previous states, there are both internal and external end users. The internal users are the managers at different levels and accountants within the organization. Generally, they are concerned about the information in corporate accounting. External users can be further divided into institutional users and trading partners. Each of their requirements is listed in Table 2.1.

<table>
<thead>
<tr>
<th>category</th>
<th>scope user</th>
<th>information form</th>
</tr>
</thead>
<tbody>
<tr>
<td>institutional users</td>
<td>investors</td>
<td>financial statements</td>
</tr>
<tr>
<td></td>
<td>stockholders</td>
<td>tax returns</td>
</tr>
<tr>
<td></td>
<td>potential creditors</td>
<td>other reports that are required by firms’ obligation</td>
</tr>
<tr>
<td></td>
<td>regulatory agencies</td>
<td></td>
</tr>
<tr>
<td></td>
<td>tax authorities</td>
<td></td>
</tr>
</tbody>
</table>
Data sources
As Figure 2.2 presenting, the data resources include both the external sources and the internal sources. They present the financial transactions which should be reported by the AIS.

- External sources – are the economic exchanges with the external business entities or individuals. It covers purchase of materials, sell products or service, receipt of cash and the disbursement of cash (payroll included).
- Internal sources – are the movement or exchange of resources within an organization, for example the movement of the raw materials.

Data collection
Data collection is the first procedure within the information system. It is responsible for guaranteeing the validity and completeness of the data, which is entered into the system, and make them free from material errors. In this term, there are two criteria defined to assess the performance of data collection – the relevance and the efficiency. Efficient data collection can capture and store data by only one time, and then the data could be used to satisfy multiple users’ needs without duplications.

Data processing
This is the second procedure within the AIS, which processes the data that is input in the first procedure to useful information.

Database management
Database management works with the data processing procedure. It mainly completes three functions: storage, retrieval, and deletion.

- Storage – responsible for allocating and storing new records in the proper location in the database. After complete processing, storage also takes charge of restoring and updating the records to the proper place.
- Retrieval – intended to locate and extract existing record from database for processing.
- Deletion – aimed at permanently removing obsolete or redundant records from database.

Information generation
This is the last procedure in the information system. In this process, information will be compiled, arranged, formatted, and finally presented the users. The useful and effective information should own the following features:
✓ Relevance – the presented information must serve for identified purpose. Only relevant information should be in the reports.

✓ Timeliness – the provided information must be in the same period of the action it support, but not older.

✓ Accuracy – information should be free from the material error. However, this is difficult to achieve in the real practice. The accuracy and the timeliness sometimes have a conflict. Well-designed AIS will try to make a balance between the information to make it as accurate as possible, as the same time ensure it is timely enough to be used.

✓ Completeness – all information that is essential for serving the purpose should be presented.

✓ Summarization – generated information should integrated consider the effects from the organizational structure and the managerial level. Users should be supported by the information that fit to their need.

➢ Feedback
Same to the data sources, the feedback also includes both the internal and external. It is a part of the outcome of the IS, which will be sent back to the data sources and used for initiating or altering some process.

Noticeable, at the end, James also mentioned that AIS’s objective as an essential element can be used to view the performance of the AIS. The issue about the objective has already been discussed in the former sections.

2.3.3 System viewing techniques

In order to have a deeper insight of the data processing systems, several techniques were created by the professionals. This includes data flow diagram, flowcharts, entity-relationship diagram, decision table, and so on. In this section, the author focuses on the two most extensively used techniques – data flow diagram and flowcharts. Via comparing their advantage and disadvantage, the author finally chose one as the technique to assess the continuity of the AIS. Besides showing their pros and cons, the symbols within each technique are also introduced in this section. This is necessary to both read and draw the related visual forms.

Data Flow Diagram (DFD)

Broadly speaking, there are two DFD types – logical DFD and physical DFD. The former one stress the content of the data flow, while the latter one focus more on the environment of the data flow. Two of these types use the four same symbols in
presenting the data flow - the terminator/entity, the process, data flow, and data store (see Table 2.2). Commonly, the logical DFD is composed of the diagram in different levels. Based on the detailed degree, the professionals could determine the diagram level. The higher level diagram is composed of several lower level diagrams. It is responsible to show the complete content in the data flow. On the other side, the physical DFD is always only one diagram, which shows the way that data flows.

<table>
<thead>
<tr>
<th>Name</th>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminator</td>
<td>![Terminator Symbol]</td>
<td>Represents sources and destinations of data</td>
</tr>
<tr>
<td>Process</td>
<td>![Process Symbol]</td>
<td>Task or function being done</td>
</tr>
<tr>
<td>Data flow</td>
<td>![Data Flow Symbol]</td>
<td>Communication channel</td>
</tr>
<tr>
<td>Data store</td>
<td>![Data Store Symbol]</td>
<td>A repository of data</td>
</tr>
</tbody>
</table>

Table 2.2 symbols in DFD

As there are only four symbols, the DFD is relative easy and simple to understand. Meanwhile, it is helpful in identifying system boundaries and analyzing the system at different levels of details; and it is based on the prospective of data flow. However, DFD can also be extremely complex, as the details level can always go deeper. This may lead to the time-consumption in designing or improving processes and high difficulties in the revision.

**Flowcharts**

Based on the statements of Boczko (2007), flowcharts can be used by system professionals to
- identify the redundancies and/or delays in system and document flows;
- identify the boundary within a system or document flow;
- identify the possible improvement; and
- improve the understanding about a system or document flow.

To satisfy these requirements, symbols are used in flowcharts (see Table 2.3) to represent different meanings. And normally, they are drawn or interpreted from left to right and from top to bottom.
<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Symbols</td>
<td></td>
</tr>
<tr>
<td>Annotation</td>
<td></td>
</tr>
<tr>
<td>Process</td>
<td></td>
</tr>
<tr>
<td>Flowline</td>
<td></td>
</tr>
<tr>
<td>Input/output</td>
<td></td>
</tr>
<tr>
<td>Specialized Input/output Symbols</td>
<td></td>
</tr>
<tr>
<td>Punched card</td>
<td></td>
</tr>
<tr>
<td>Online storage</td>
<td></td>
</tr>
<tr>
<td>Punched tape</td>
<td></td>
</tr>
<tr>
<td>Magnetic tape</td>
<td></td>
</tr>
<tr>
<td>Magnetic disk</td>
<td></td>
</tr>
<tr>
<td>Document</td>
<td></td>
</tr>
<tr>
<td>Manual Input</td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td></td>
</tr>
<tr>
<td>Offline storage</td>
<td></td>
</tr>
<tr>
<td>Communication link</td>
<td></td>
</tr>
<tr>
<td>Specialized Process Symbols</td>
<td></td>
</tr>
<tr>
<td>Decision</td>
<td></td>
</tr>
<tr>
<td>Predefined process</td>
<td></td>
</tr>
<tr>
<td>Preparation</td>
<td></td>
</tr>
<tr>
<td>Manual operation</td>
<td></td>
</tr>
<tr>
<td>Auxiliary operation</td>
<td></td>
</tr>
<tr>
<td>Merge</td>
<td></td>
</tr>
<tr>
<td>Extract</td>
<td></td>
</tr>
<tr>
<td>Sort</td>
<td></td>
</tr>
<tr>
<td>Collate</td>
<td></td>
</tr>
<tr>
<td>Additional Symbols</td>
<td></td>
</tr>
<tr>
<td>Connector</td>
<td></td>
</tr>
<tr>
<td>Off-page connector</td>
<td></td>
</tr>
<tr>
<td>Terminal</td>
<td></td>
</tr>
<tr>
<td>Parallel mode</td>
<td></td>
</tr>
<tr>
<td>Transmission tape</td>
<td></td>
</tr>
</tbody>
</table>

Table 2.3 symbols in flowchart

Differed by the level of detail, there are macro level flowchart, midi level flowchart, and micro level flowchart. Wherein, the macro level flowchart shows the big picture of the system, such as a flowchart that is used to visualize a firm’s transaction processing system; the midi level flowchart focuses on one single component of the macro level flowchart, such as the document flow within the procure cycle; and the micro level flowchart provides very detailed sight of the specific component of a system. Amongst these three levels, the micro level flowcharts are mainly used to assess the internal control within a system by showing every action, flow and decision within the system segment.

From another prospective, the flowchart can be also distinguished by their types. Insofar, the flowcharts can be classified to system flowchart, program flowchart and documents flowchart. While the system flowchart identifies the overall or broad flow of operations in a system; the program flowchart focuses each processing approach; the document flowchart demonstrates the flows of documents and information within a system. Therein, the document flowchart is concentrated on “how the document flow occurs”, “what documents flow”, and “whom the documents flow to-and-from”.

Because of the explicit definition of the symbols, flowcharts remove the needs of additional explanation, and can be drawn without much profession. In addition, the flowchart can be good at defining the record scope, which avoids consuming too much time in much more detailed segments. The most important, the flowchart is very helpful in assessing a system by identifying the information flow, activities and decision making loop within the system. However, it also has some pitfalls. The explicit defined aspects and levels also make the flowchart more suitable for the standard or the dynamic system.

**Choice of technique**

Comparing the above two technique, the author determined to use flowchart to view the system, because of the following considerations:
- the well defined scope can save the research time and remit the time constraints;
- the subject system is the dynamic and standard;
- the author is not professional in system viewing technique;
- a document flowchart with micro level can accurately satisfy the needs of examining the information continuity.

Based on the following aspects, the author decided to apply a document flowchart with micro level in viewing the technique. The viewing segments are the different transaction processes within the grain trade business, as the grain trade is the main business of Qiaofule Company. Based on the instruction in this section, the author drew the flowcharts are supplied them in Chapter 4.
2.3.4 Motivation

This section is about the first point of this research, the evaluation of system performance from the view of itself. Two approaches are mentioned, the general viewing model and system viewing techniques. While the former explains how an organization can generally view its AIS, the latter is more useful in having a deeper insight into the information flow. Readers can also achieve enough knowledge to understand the flowcharts that are used in Chapter 4 (see Appendix M).

2.4 Influences on AIS

Besides the system itself, there are many other influences that impact the AIS’s performance. These factors are discussed in this sub-chapter and parted, based on their natures, to internal influences and external influences.

2.4.1 Internal influences

The internal influences refer to the impact within the enterprise. Relative issues include the size of the company, the structure of the company, the industry that company is involved, available internal resources, features of internal management, the knowledge base and employees’ intellectual capacity, and the complexity of information requirements (Boczko, 2007). Insofar, some are the natures of enterprises, such as the enterprise size and industrial field, which have extensively influences on a variety of aspects within the enterprise. Meanwhile, some elements are management-oriented, like the company structure and, the internal management features, which reflect the soft power of the enterprise. Also, some directly relate to the AIS, like the complexity of the required information and the available resources within the company. Furthermore, personnel are also an important issue which can influence the performance of AIS.

Figure 2.3 Research model for proving the relationship between influence factors and AIS performance

Source from: Journal of Management Information Systems / Spring 1996, Vol. 12, No. 4, pp.221
Jong-min Choe (1996) proved the relationship between the influence factors and the performance of AIS in his article “The Relationships among Performance of Accounting Information Systems, Influence Factors, and Evolution Level of Information Systems”\(^6\). In this article, he enhanced the importance of the system normalization, especially at the stage when company is on process of extending. Moreover, he examined some factors’ influences on AIS’s performance which are shown in Figure 2.3. Within this model, the evolution of IS was treated as the splitting point, due to its impact to the performance of AIS. In his demonstration, top management support has continuous positive impact of the performance of AIS. Formalization of system development is very essential in the primary stage of the AIS. Technical capability of IS personnel, user involvement, user training & education, and organization size has positively increasing impact on the performance of AIS, with the evolution of IS. His study enhanced the influence from the implementation processes and outstoo the function of personnel in improving the performance of AIS.

More resent study outcome from Salehi and Abdoreza in 2011 also proved the influences from middle managers, human resources, organizational structure, environmental factors, financial issues and organizational culture.

### 2.4.2 External influences

When analyze the external environment, it is common to use STEP model. As to the external influences for the AIS, this is also reasonable; and in the real studies, the external influences are indeed defined by the social, technological, economic, and political aspects: (Boczko, 2007)

- Social influence means the requirements from the reporting standard, like the US GAAP or IFRS.
- Technological influence means the hardware or software that applied within AIS.
- Economic influence refers to the requirements from market regulatory, like the requirements for the public companies.
- Political influence refers to the requirements from the company laws.

Besides the technological influence that has been discussed in Chapter 2.2.4, other regulation-related influences are extended in next chapter.

### 2.4.3 Motivation

This section is a supplementary for the last section. By providing the other influences on AIS’s performance, the author can better understand the dominations of AIS’s performance. Differed to the original system design, this section is mainly about the implementation procedures and the influences from the organizational context. This is helpful in defining the underlying root of the not ideal performance.

2.5 Regulations

2.5.1 Accounting rules

Corporate accounting practice are guided and limited by series of accounting rules. As "accounting is a technology which is practiced within varying political, economic and social contexts" (Parker, 2011), accounting regulations can be very national. However, from last century, regulatory authorities in international accounting practice have concentrated on the globalization of accounting rules and practices. The outcomes include International Financial Reporting Standards (IFRS), issued by International Accounting Standards Board (IASB); Directives and Regulations on accounting and financial reporting, issued by European Union (EU); and generally accepted accounting principles (GAAP), issued by American Institute of Certified Public Accountants (AICPA). These provide the most extensively applied accounting rules; however, the detailed applications are still differed from nation to nation.

In 2006, China issued the new accounting regulation and improved its integration of world trade and capital market by adopting a significant number of the accounting standards laid out by the International Accounting Standards Board (IASB). Chinese Accounting Standards (CAS) was largely replaced by the International Financial Reporting Standards (IFRS). The detailed provisions, especially, the requirements are written in law and issued by Chinese Ministry of Finance (MOF) in January 1, 2007.

Chinese accounting standards (CAS)

The MOF has been working to develop a body of Chinese Accounting Standards that are broadly in line with International Accounting Standards (IAS). The MOF issued its first standard in 1997. To date, 16 standards have been adopted and others are under active development. Table 2.4 shows the complete CAS and validity data and the applicability.

<table>
<thead>
<tr>
<th>Accounting Standard</th>
<th>Effective Date</th>
<th>Applicability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Disclosure of Related Party Relationships and Transactions</td>
<td>1 Jan. 1997</td>
<td>Listed enterprises</td>
</tr>
<tr>
<td>2 Cash Flow Statements (minor revision in 2001)</td>
<td>1 Jan. 2001</td>
<td>All enterprises</td>
</tr>
<tr>
<td>3 Events Occurring After the Balance Sheet Date</td>
<td>1 Jan. 1998</td>
<td>Listed enterprises</td>
</tr>
<tr>
<td>4 Debt Restructuring (revised significantly in 2001)</td>
<td>1 Jan. 2001</td>
<td>All enterprises</td>
</tr>
<tr>
<td>5 Revenue</td>
<td>1 Jan. 1999</td>
<td>Listed enterprises</td>
</tr>
</tbody>
</table>
Besides this, the MOF issued “Small Enterprise Accounting System” in 2005, to better fit the characteristics and requirements of the small business in China. Until the year 2012, small companies in China are required to conduct their accounting practices based on this regulation. However, with the bombing number of small business, new situation emerged companied by new problems in small enterprises’ accounting practices. To actively respond the changes, the administration improved the former regulation and promoted a series of new financial and accounting regulations; and then in Jan. 1, 2013, the “Small Enterprises Regulations” was officially effective and replaced the function of “Small Enterprise Accounting System” in monitoring small business accounting practices.

As the provision 1 states:

in order to regulate the behavior of small enterprise accounting recognition, measurement and reporting, and promote the sustainable development of small businesses, play the important role of small enterprises in the national economy and social development, according to the "accounting law of the People's Republic of China" and other relevant laws and regulations, and rules are formulated.

This regulation defines all the standards for small companies’ accounting practices, especially in the accounts setting, main accounting treatments and financial statements reporting. The original accounts regulation and the forms for financial statements are listed in Appendix A & B.
2.5.2 Information quality

Accounting information quality directly influences the quality of financial reporting and other information supports for the enterprise management. In the international business environment, the blank of the systematic information quality control has been improved. Several acts/items were gradually issued, which includes relative provisions in ISO and Sarbanes-Oxley Act. However, these requirements are fit to the big enterprises that have gone public. As to the small business, especially the local non-issued small enterprises, relative requirements at local state are more feasible in the quality control and inspection.

**Chinese accounting regulations**

In “the Accounting Standards for Enterprises” the accounting information quality requirements are listed in one complete chapter (Chapter Two, the Accounting Information Quality Requirements), with eight articles. These requirements focus on the information governance in its objectivity, comparability, relevance, consistency, timeliness, and understandability.

*Article 12* An enterprise shall be based on actual transactions or events in processing the accounting recognition, measurement and reporting, and truthfully reflect the accounting elements and other related information which conform to the requirements of accounting recognition and measurement; ensures the accounting information reliability and the content integrity.

*Article 13* Accounting information provided by enterprises shall be related to the economic decisions of users and the needs in financial reports; in addition, help users of financial reports to understand the enterprise past and make evaluation or forecast for enterprise present or future.

*Article 14* Accounting information provided by enterprises shall be clear and easy to understand and use for the users of financial reports.

*Article 15* Accounting information provided by enterprises shall be comparable.

The same enterprise in different periods shall adopt consistent accounting policies to the same or similar transactions or events; and shall not be arbitrarily changed the policies. For the necessary situations, the changes ought to be added in the notes. Different enterprises shall adopt prescribed accounting policies to the same or similar transactions or events; and ensure that accounting information is comparable and prepared on a consistent basis.

*Article 16* An enterprise shall implement the accounting recognition, measurement and reporting in accordance with the economic substance of transactions or events; but not their legal forms.

*Article 17* Accounting information provided by enterprises shall reflect all the important transactions or events about the enterprise financial position, operating results and cash flow etc.
Article 18 Enterprises accounting for transactions or events recognition, measurement and reporting should keep the due care; and shall not overstate assets or income, understated liabilities or expenses.

Article 19 An enterprise shall carry out the occurred transactions or events in a timely accounting recognition, measurement and reporting; and may not process in advance or delay.

Except these requirements, there is no other authorized standard for information quality control in the AIS in the current effective Chinese regulations.

2.5.3 Motivation

This section shows the regulatory context of AIS. By introducing relative knowledge, readers can understand the influences of these rules to the AIS. This is also used to guide the author case specific regulations that fit to the target company’s situation. This section also provides the basic view of the criteria to assess the reliability.

2.6 Development of AIS

In this part, the author brings concept “SDLC” and shows the elements in this model. As this model is intended to big companies, more methods for SMEs to improve their AIS are also covered in this section. These are necessary to be know in further to give recommendations.

2.6.1 System development life cycle (SDLC)

The system development life cycle is a model used to help organizations improve their systems to make them better satisfy users’ requirement. James A. Hall extended the basic model, in 2008, and split the development into in-house and commercial package, which respectively fit to bigger companies smaller companies. Figure 2.5 presents the extended SDLC which provides an overview of related phases.

Based on this model, enterprise is supposed to do a lot preparation work before initiating the system improvement project. This includes assessing strategic information needs, developing a strategic system plan, and creating an action plan. These analyses should be conducted by professionals or internal personnel and come out reports to steering committee. Even after initiating the system development project, several reports are still required for promoting to next step. Obviously, these complicated procedures are proposed for big enterprise to help them avoid the possible risk in advance; however, it may not be so proper for smaller companies. As to small businesses, there are not sufficient personnel to conduct specific reports for system development. There might not be steering committee, neither. In this term, it is reasonable for smaller enterprises to combine some processes and save time and
labor from too complex procedures. However, the system objective should be clearly defined, which cannot be skipped within any way.

Figure 2.4 systems development life cycle

2.6.2 Commercial packages

Compared with the in-house development, purchasing a commercial package is more proper for small companies. In the mature commercial package market, there are mainly three kinds of commercial package which are elaborated in this section.

**Turnkey systems**

This kind of system is the most completed one, which can be directly applied into the accounting practice after the purchase. However, it also shows low flexibility in satisfying specific needs of information users. Normally, this kind of AIS owns relative lower price than the other two kinds.
**Backbone systems**

This kind of system is somehow like the system “in-processing”. It provides the primary logic, and later designs the interfaces based on the users’ requirements. Thus, it also can be treated as an intermediate of turnkey and vendor-support. Its price is also higher than Turnkey but lower than vendor-support.

**Vendor-support systems**

Commonly this happens in organizations in healthcare and legal services, as their requirement to IS is complex. This is like to outsourcing the in-house system development to vendors. The entire design implementation and maintains of the system will be responsible by the vendor. As this provides the most comprehensive services, it is also the most expensive way.

**2.6.3 Motivation**

As the last part, this section is aimed at providing an overview of the system development. By providing the SDLC, readers can know the regular procedures to improve an AIS; in further, commercial package as the new trend of system improving, provides another choice which is more suitable for small and medium size companies. This guides the data collection in Chapter 4 to show the status of the commercial AIS package in China. By comparing the function, improve duration and budget of each method, the author can provide recommendation in system improving Chapter 6.

**2.7 Chapter summary**

In this chapter, the author tried to provide necessary information in AIS evaluation, main influences on AIS's performance and the approach to improve an AIS. As Figure 2.5 showing, theories in basic concepts, viewing methods & techniques and related regulation are used to determine the viewing elements in the process of evaluating the target AIS. These theories support the evaluation from the system itself. Corresponding to this is the system development method, which assist the improvement of the system itself. Besides the system, there are more considerations that have impact on the AIS’s performance, mainly from the character of the involving industry, the organizational context and the implementation of the system.

Based on these theories, literature-based sub-questions can be answered, as a part of the chapter summary.

First of all, it could be necessary to refresh the two relative questions:

- What are the main elements in viewing the performance of the AIS?
How important are these elements in evaluating the performance of AIS?

Answer for Question 1

According to the general model, the main elements in viewing the AIS include: end users, data sources, data collection, data processing, database management, information generation, and users' feedback.

However, this model was initially designed to evaluate all kinds of IS, which is too general to show the feature of accounting. To make the evaluation more valid, it had better to add more considerations and revise the evaluating elements.

First of all, from the basic definition, any IS should be objective-motivated. No matter
how wide the definition of AIS was improved, it was consistently designed to satisfy the needs in information of different users. In this term, the evaluation should cover the system objective and the status of its achievement; as well as the satisfaction conditions of different users.

Then as a system, its structure should be well-defined and the connection between each subsystem should be logical and continuous. To have an overview of the AIS design and to assess whether the target covers the three dominants of AIS, it is necessary to involve system framework as one of the evaluation elements.

Narrowed down to the micro level, from the pure prospective of IS, data processing procedures should be viewed. As the general model defines, the elements have:

- data collection,
- data processing,
- database management, and
- information generation.

Accompanied with the data processing procedure is the technology for processing data. Then this extracts the IT application hierarchy within the AIS, which also should be considered; as it can show the effect of applying AIS in processing data.

To have a deeper insight into the information delivery, it is necessary to visualize the information flow and examines whether there is some gap in the delivery procedures. Based on the statement in Chapter 2.3, this can be achieved by viewing the information flowcharts.

So far, the elements are mainly about the system itself; however, it is also required to have compliance on relative regulations. In this chapter, the regulation mainly means the accounting standards and the requirement for accounting information. These two are also necessary to be viewed in the evaluation.

In conclusion, there are 11 elements in total:

- system objective;
- users’ feedback;
- system framework;
- data collection;
- data processing;
- database management;
- information generation;
- technology application hierarchy;
- information flow;
- accounting regulation; and
- accounting information requirements.
To conclude the function of these 15 elements in viewing the performance of AIS, a table was prepared.

<table>
<thead>
<tr>
<th>Angles</th>
<th>Elements</th>
<th>Function in evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. regulations</td>
<td>effective accounting regulations</td>
<td>As the premise for all accounting practices’ rationality, it is necessary obey the relative regulations. These two elements are required to evaluate whether the AIS is fully compliant on relative regulations, in order to define the reliability of the evaluated AIS.</td>
</tr>
<tr>
<td></td>
<td>information quality requirements</td>
<td></td>
</tr>
<tr>
<td>2. objectives</td>
<td>AIS objective</td>
<td>As the root of an IS, the system objective is the motivation for all activities related to the system. Through checking whether the AIS’s objectives are achieved and whether the users’ needs are satisfied, the author can define its effectiveness.</td>
</tr>
<tr>
<td></td>
<td>users’ feedback</td>
<td></td>
</tr>
<tr>
<td>4. Macro-view of system</td>
<td>AIS framework</td>
<td>From the prospective of a system, it is necessary to check whether the internal logic is fluent and consistent. By viewing the framework, the author can better understand the initial design of the AIS and then assessed whether the subsystems are sufficient and logical connected. This could be a part of continuity. By viewing the IT application, the author can generally define the effect of the AIS which is for assessing the efficiency</td>
</tr>
<tr>
<td></td>
<td>technology application hierarchy</td>
<td></td>
</tr>
<tr>
<td>5. Micro-view of system</td>
<td>data collection</td>
<td>From more operation level, data processing procedures are also needed to be checked. General viewing model define the relative elements and the criteria to assess their performance. By viewing these elements, the efficiency of data processing within the system is expected to be estimated.</td>
</tr>
<tr>
<td></td>
<td>data processing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>database management</td>
<td></td>
</tr>
<tr>
<td></td>
<td>information generation</td>
<td></td>
</tr>
<tr>
<td>6. information flow</td>
<td>flowchart of information</td>
<td>Information flowcharts can visualize the delivery procedures of the information. This can be useful to discover the possibility and frequency of miss/repeat/distortion of the original data/information in the delivery processes.</td>
</tr>
</tbody>
</table>
Chapter 3 Methodology

3.1 Chapter introduction

In this chapter, the author will show all the content related to the research processes. To make the research hierarchy more visible and provide convenience to readers to fully understand the connection between each research concept, this section was conducted based on Saunders’ research onion (see Figure 3.1). In this term, the main content in this chapter covers the author’s philosophy, the research approach, research methodological choice, research strategy, time horizon, and techniques and procedures of data collection and data analysis. Besides the elements in the research onion, the author also lists the constraints of this research and the corresponding measures for ensuring the research’s quality.

![Figure 3.1 Research onion](image)


3.2 Author’s philosophy

As the way of human beings viewing the world, the philosophy provides one an angle to cognize surroundings and form assumptions. As Johnson and Clark (2006) asserted, its importance was not only at the impact on what we do, but how we understand the things we are investigating.
In the study of Mark Saunders, Philip Lewis and Adrian Thornhill, (2011) one’s philosophy was determined by individuals “particular view of what is acceptable knowledge and the process by which this is developed”. Based on these two standards, there are four type of philosophy defined, which respectively are pragmatism, positivism, realism, and interpretive. Wherein, the author belongs to the realism, and especially the critical realism due to the following identified characteristics; vice versa, these characters influence the choice within research conduction. The relative features include,

- Consider the nature of reality is objective and exists independently; however, the interpretation of the reality is through social conditioning.
- Think both the existing and the sensation it conveys and the mental processing of these sensations is equally important in experiencing the world.
- Treat the knowledge of reality as a result of social conditioning which is impossible to be complete objective.
- Understand the importance to study within diversified levels, and focus on explaining within related contexts.
- Believe the world is constantly changing.

This research was conducted based on such a philosophy. These feathers are further performed on a variety of aspects within research design.

3.3 Research approach

As Figure 3.1 presenting, there are mainly three reasoning methods within conducting a research – deduction, induction, and abduction. And these three approaches can be identified from four aspects – the logic, the generalisability, the use of data, and the theory.

This research applies a deduction reasoning form, as the author generalizes from a series of defined viewing elements to the specific case and apply them to evaluate the performance of the target AIS. This way that is from broad to specific is typically deduction. However, the identification process for the viewing elements is not accurately fit to this reasoning approach. It is more like abduction that involving more elements and judging whether it is fit to be involved. That interacted between the general model and other elements from different angles, to improve the relevance and accuracy of the viewing model.

3.4 Research strategy

Evaluation Research

In the research onion, there is a similar strategy, the action strategy; however, it still cannot exactly fit to the objective of this research. The action strategy stresses on the cycle from evaluating to diagnosing then planning and ended with taking action. It enhances the processes of determining the action. However, this research is merely focus on the evaluation. Of course, recommendation for further improvement is asked; however, this will not be included into the main body of the research. The author will
explore the roots of the weak performance of the AIS, provide different methods to improve the AIS, and then give the advice within different expectations and implementation time. However, the entire research was only scoped on the evaluation of the performance of the target AIS.

In the book *Real World Research* (Robson, 2011), some research with particular purpose was highlighted out. The author provides research strategy design especially for these purpose, and evaluation is one of them. As the book says “The purpose of an evaluation is to assess the effects and effectiveness of something.” (Robson, 2011) This accurately matches the purpose of this research, to evaluate the performance of the current accounting information system of a company. In the book, the author also mentions that an evaluation research is always connected with the further improvement. This again exactly matches the left part of the main research question. In addition, because of the flexibility of design and execution of the case study, evaluation research appreciates a case study method (Robson, 2011). Then we will continue the discuss about the other strategy – single case study.

**Single case study**

Against with the traditional dividing of the research strategies, Dr. Yin proposed a new view to distinguish research strategy to inclusive and pluralistic one. Each strategy could be used for all three purposes: exploratory, descriptive, or explanatory.

In the book *Case Study Research Design and Methods*, he claims that case study is one of the primary research strategy, but not only a form of record keeping. He later distinguished the case study method to other research strategies with listing three indicators. The following figure shows the criteria and the corresponding appropriate research strategy.


In this research, the questions are mainly about “how”; and there is no need to control the behavioral events; and it focus on the current AIS. Based on the criteria in Figure4, a case study strategy fits these requirements. As the research will only be conducted in single company, and the data collected is also merely related to the unique company; this research will apply a single case study. In his book, Dr. Yin also
mentioned, regularly an evaluation research will appreciate the single case study as the basic research strategy.

### 3.5 Methodology choice

**Mixed method**

Based on the statement in *Research Design* (Creswell, 2009), there are three research method – the qualitative, the quantitative and the mixed methods. This research will apply a mixed method, because of the following consideration.

To an evaluation research, the core is to identify the viewing elements and the corresponding standards for the performance evaluation. In this case, to make the standards more critical, the researcher would like to define the viewing elements from different prospectives. Besides the general viewing model, which shows the efficiency within the operational level of the AIS, the author also involved the system objective, a macro-view of the system, compliance on the external influences and the information flow. There is only comparative matured model to provide a general way of viewing the performance of AIS; however, this model is merely defined generally. In order to have a specific evaluation for the AIS applied by the target company, the researcher need to clearly define the model that applied to evaluate the performance. As there is no one existing model can satisfy the author’s requirement, the process to define the criteria is open. Then the well-defined model will instruct the close-ended evaluation. In this term, the research mixed open and close structure.

Meanwhile, the process of the research combines a desk research and an empirical observation of the company. First of all the determination of the benchmark to evaluate the performance of AIS is from both the theoretical data and the empirical data. Then, the conduction of the research is based on the instruction of the theories, however, will actually be completed by series of practice around the research objective. In addition, the research questions are also defined both in theories-based and practice-based. Finally, the conclusion and recommendation are also proposed, based on both the existing theories and the real situation of the company, such as the organization context and the assumption for different expectations. With these considerations, a combined method of theoretical-based and empirical-based will be applied throughout the research processing.

### 3.6 Time horizon

Because of the time limitation, this research is likely to be cross-sectional. The researcher started the data collection before the complete defining of the evolution criteria. However, it cannot prevent the research from involving longitudinal elements. Even though the evaluation criteria were kept on improvement, the existing part can somehow guide the data collection. This is quite necessary to the contemporary research, as the massive and immense amount of information.
3.7 Techniques and procedures for data collection and analysis

3.7.1 Research units

**Unit of analysis**

As this research is an evaluation research for assessing the performance of Qiaofule Company’s AIS, the unit of analysis will be the performance of the current AIS employed by Qiaofule Company and the new requirements to the current AIS. The performance will be examined basically by the elements defined in the general model; combined by the comparison with the standard AIS framework, the compliance to accounting principles and information quality requirements, the AIS models in history, and the examination of the system objectives’ achievement situation. The performance in its effectiveness, efficiency, continuity and reliability will be evaluated. These four dimensions will be defined and applied as the analysis units.

**Unit of observation**

In order to know the AIS model, functional situation, its framework, information quality and the new challenges which will be brought by the further business strategy; related information is necessary. First of all, external influences could be achieved from the field’s practitioners and professionals. Internal information about the company could be achieved from the employees in Qiaofule Company. The model and framework of AIS could be known by interviews with the employees and the internal observation. Wherein, the most important unit is the users of AIS, who work with the system and accounting activities daily. In one word, the unit of observation in this research is supposed to be the manager and employees in Qiaofule Company and relative practitioners and professionals in accounting practice.

3.7.2 Techniques for data collection

In order to complement the mixed method research, relative research activities and the necessary data should be designed. In this research, two kinds of data will be collected via four methods.

The data includes primary data and secondary data. Wherein, primary data will be collected by interviews and observation. And the secondary data will be collected from relative documentation like the internal data (includes bookkeeping journals and computer records) and the public information.

The following table lists the details of the necessary data & information, and the corresponded questions, as well as the method to collect the data.
## Table 3.1 Necessary data and related activities

<table>
<thead>
<tr>
<th>Data &amp; Information</th>
<th>Resolved question(s)</th>
<th>Collect method(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>accounting principles</td>
<td>Question 1,2</td>
<td>Desk research</td>
</tr>
<tr>
<td>AIS models, connection with IT</td>
<td>Question 1,2</td>
<td>Desk research</td>
</tr>
<tr>
<td>AIS viewing model</td>
<td>Question 1,2</td>
<td>Desk research</td>
</tr>
<tr>
<td>ISO, Sarbanes-Oxley Act</td>
<td>Question 1,2</td>
<td>Desk research</td>
</tr>
<tr>
<td>AIS framework and viewing techniques</td>
<td>Question 1,2,8</td>
<td>Desk research</td>
</tr>
<tr>
<td>AIS architecture</td>
<td>Question 1,2</td>
<td>Desk research</td>
</tr>
<tr>
<td>AIS objectives/functions</td>
<td>Question 1,2</td>
<td>Desk research</td>
</tr>
<tr>
<td>SDLC model</td>
<td></td>
<td>Desk research</td>
</tr>
<tr>
<td>AIS improvement technique</td>
<td></td>
<td>Desk research</td>
</tr>
<tr>
<td>general budget for different methods</td>
<td></td>
<td>Online research, calculate</td>
</tr>
<tr>
<td>target AIS’s IT application situation and data process methods</td>
<td>Question 5</td>
<td>Interview (top manager)</td>
</tr>
<tr>
<td>external users’ feedback</td>
<td>Question 4</td>
<td>Interview (practitioners)</td>
</tr>
<tr>
<td>company’s economic events and the corresponding transaction processes both for current situation &amp; scenario based on the further business strategy</td>
<td>Question 3,6,7</td>
<td>Interview (employees)</td>
</tr>
<tr>
<td>target AIS objectives both current &amp; new requirements for next plan</td>
<td>Question 3,4,6</td>
<td>Interview (manager)</td>
</tr>
<tr>
<td>bottlenecks, redundant operations and error rate</td>
<td>Question 5</td>
<td>Interview (employees)</td>
</tr>
<tr>
<td>the task segmentation &amp; internal communication</td>
<td>Question 3,5,7</td>
<td>Interview (employees)</td>
</tr>
<tr>
<td>data management situation of target AIS (input, output and process)</td>
<td>Question 5</td>
<td>Interview (employees)</td>
</tr>
<tr>
<td>internal users’ feedback</td>
<td>Question 3,5</td>
<td>Interview (employees)</td>
</tr>
<tr>
<td>data recording, bookkeeping method, the other accounting activities</td>
<td>Question 3,6</td>
<td>Interview, Observation &amp; Documentation</td>
</tr>
<tr>
<td>data and information quality</td>
<td>Question 3,</td>
<td>Interview, Observation &amp; Documentation</td>
</tr>
<tr>
<td>data flows (movement of documents, reports, cash and so on)</td>
<td>Question 3,7</td>
<td>Interview, Observation &amp; Documentation</td>
</tr>
</tbody>
</table>

Insofar, all empirical findings will be collected from three approaches - interviews, observation, and documentation.

### Interviews

The author will apply semi-structured to the interviews with the top manager,
employee and related practitioners like the staff in bank and tax authority. Classified by the respondent, the interviews have three categories, respectively shown below:

 allotted

### Interview with top manager/owner

Interview with the top manager is necessary before the research, for initially understanding the research task and the company information. This includes the business running condition, company structure, its current employees, its business strategy, the plan for next step, and the expected outcome after initiating the business plan. Then the author also wants to know the historical context of the current AIS, its previous objective and new requirements to the AIS from the view of the top manager.

During the observation in the company, the researcher needs to achieve information in its business operations, transaction processes, physical flow of cash and other resources, and the value chain both in the current situation and the scenario of the further position. From the internal communication aspect, the researcher also wants to understand the task segmentation and the methods for internal communication from the view of the top manager.

After the observation, the researcher needs to confirm the understanding with the top manager and ask for the budget and time planning for improving the current AIS.

### Interview with employees

During the observation in the company the author will interview the employees to identify the flows of information, the flow of cash, the regular accounting activities and current accounting system, the feedback of the internal users about the AIS, and the task segmentations from the employees' perspectives. The author also wants to accurately understand the outcome of the AIS from the interviews. The collected information will be rechecked and compared by the evidence from the observation and the interviews with the top manager.

### Interview with the practitioners in relative field

The researcher would like to interview some accounting-related professional to better know the effective accounting regulations in China. If there is a chance, the researcher even wants to interview some expertise who is doing or has done some research in the status of accounting practice in small Chinese enterprises. Meanwhile, to get the feedback from external users of the AIS, the researcher will interview the staffs in related bank and tax authority.

### Observation

In addition, this research will apply an external observation to understand the daily operation and the relative relationship with the AIS within the company. Through this
external observation, the author can compare the information achieved from interviews with the real operation conditions. By passively watching the transaction processes, the researcher can better imagine the possible influence from initiating its business plan.

**Documentation**

The documentation mainly means the internal data of this company, which relates to the conveying of relative information and the outcome used for making decisions and enhancing the internal management. This includes:

- organizational charts
- job description
- accounting records,
- charts of accounts,
- policy statements,
- description of procedures,
- financial statements,
- source documents,
- transaction listings,
- budgets,
- forecasts, and
- any other standard form that is used in the daily operation.

**3.8 Validity and Reliability**

Validity and reliability of resources is a big issue in a research, as they directly influence the quality of the outcome of the research. Generally, there are three kinds of threats on the validity – internal validity threats, external validity threats and constructs validity threats. Because of the feature of a single case study, the external validity is not necessary to be considered; however validity of internal and construct adversely influence the accuracy.

**3.8.1 Validity**

Types of threat to internal validity cover issues like history, maturation, regression, selection, mortality, diffusion of treatment, compensatory demoralization, compensatory rivalry, testing and instruction. While constructive validity focuses more on the possible inadequate definitions and measurements of variables. In order to avoid the lack of definition of the variables, the author integrated main studies about the AIS since 21st century, and defined the evaluation criteria from different dimensions. Finally the author picked up the most relevant, assessable, and systematic elements which are also feasible in the evaluation processes. Based on
the outcome of AIS evaluation, recommendation will be given to Qiaofule Company as another part of the outcome of this research thesis.

3.8.2 Reliability

The data used in analysis is from the professional databases or authorized websites. This increases the reliability of the empirical findings. Meanwhile, literature basis are from the authority publishers published books in the latest version, which are widely admitted and applied as the study textbook in international academic area. In this term, both the theoretical and the practical basis are reliable. In case of misusage and distortion of the sources, the researcher will check the effective scope of each piece of information before apply it into the research.

3.9 Delimitation

3.9.1 Relationship between company owner and the researcher

The owner of Qiaofule Company is the researcher’s father, and the sponsor company is researcher’s family business. This might influence the objectivity of the research result. To avoid this problem, the researcher will promise to response show the research evidence faithfully, and all relative data will be collected under strict literature and regulation guidelines. In addition, an audit practitioner will also be invited to help so the research and confirm the reliability of the data and information provided. She can help the researcher evaluate the accuracy of the information from the owner.

3.9.2 Time

Time constrains is possible to be the biggest problem in the research. There are only five months for all the procedures of the thesis conducting, including the writing of proposal and thesis, and the whole process of the research. In order to make a tight time control, the researcher will make a time plan for each procedure. However, it is still possible to be late. In this case, the researcher will process the planned activities and the laggard task together, to confirm no more delay for the next step.

3.9.3 Help

As the owner and the employees need to complete their work daily. It is very possible that they have no time to systematically provide all necessary information. The blocks in communication will also influence the quality of the collected information. The author needs to confirm the information quality and sufficiency by comparing the information that achieved from different channels. In addition, the help from expertise or practitioner is hard to get.
3.10 Chapter summary

In this chapter the author presented the research design in different levels. By reviewing the research onion, the author showed the reasons and detailed content of the research designing. At last, the author also shows the approach to guarantee the quality of the collected data and the access to achieve the data; as well the underlying risk and constrains in the research processes.

In this section, the author will conclude the research elements that applied into this research by a defined research onion (see Figure 3.3).

![Figure 3.3 Identifications for the research elements](image)

Based on the above instruction, empirical findings will be collected and analyzed to answer the empirical-based questions in Chapter 5. Next chapter, the author will present these findings with the same frame that applied in the literature.
Chapter 4 Findings

4.1 Chapter introduction

In this chapter, the author will present all related evidence that were collected from research activities. These evidences mainly cover three directions, the viewing elements, the other influences on AIS’s performance and the system improvement. Wherein, the findings of viewing elements are presented within the same structure which is defined in the answer of Sub-question 2. In another words, there are 7 parts of the empirical findings, five for evaluation, one for other influences besides the system itself, and one for the AIS development.

4.2 Findings in accounting standards for Chinese SMEs

4.2.1 Findings in effective accounting regulations

New accounting principles for SMEs were issued on October 18, 2011 by the People's Republic of China Ministry of Finance to accounting [2011] of the 17; and were effective from Jan 1, 2013. The principles are composed of general, assets, liabilities, owners’ equity, revenues, expenses, profit and profit distribution, foreign currency business, financial statements, supplementary provisions of ninety articles in ten chapters.

Article 2 in “General” defines the scope of the small enterprise that available to this regulation:
This regulation applies to lawfully establish small enterprises within the territory of the People's Republic of China, which conform to the Small and Medium-sized Enterprises (SMEs) Type Standard prescribed standards. Except for the following three situations:
(1) stocks or bonds publicly traded in the market of small businesses.
(2) financial institutions or other financial properties of small businesses.
(3) within the enterprise group's parent company and subsidiaries.

While the Article 3 further explains the selection of accounting principles for small enterprises:
Small businesses to meet the requirements of article 2 can choose performing these standards or “the Accounting Standards for Enterprises “.
(a) For those performing this code, transactions or events occurred without specification in the present standards, can consult relevant provisions in “the Accounting Standards for Enterprises” for processing.
(2) The small businesses choose performing “the Accounting Standards for Enterprises” shall not be in the implementation of the related provisions of this code.
(3) The small business who executes this code, should not longer implement this code, when it till start
offering public stocks or bonds; because the changes of operation scale or business nature will lead to violation of the Article 2. Based on the Article 2, these enterprises should perform “the Accounting Standards for Enterprises” from the next year on January 1.

(4) The listed companies, large and medium-sized, and small enterprises, who have been performing “the Accounting Standards for Enterprises”, should not implement this standard.

On the other hand, “the Accounting Standards for Enterprises” is mainly composed of two parts – the general principles and the specific standards. The general principles defines the basic concepts six – asset, liability, equity, revenue, expense and profit; as well as the scope of application, the accounting measurements, financial report, and accounting information quality in ten chapters with fifty articles in total. While the specific standards are composed of 38 specific principles in inventory, long-term equity investment, investment real estate, fixed assets, and so on.

Based on the interview with the accountant, Qiaofule Company has been performing “the Accounting Standards for Enterprises” from 2007. The accounting processing was based on the standards in “the Accounting Standards for Enterprises”. And finally report the financial situation and declare the tax to the tax authorities.

However, the AIS is continuously apply the standard which abolished in 1999, and only set the basic accounts within the AIS (see Appendix C) that includes cash (1101), bank account (1111), AR (1141), prepaid payment (1171), inventory (11AA), current asset (11DD), package (1411), fixed asset (1601), total assets (11CC), short-term debt (2101), AP (2121), advanced received sale revenue (2123), salary payable (2131), current liability (22AA), net profit (3101), annual profit (3301), equity 33AA), sales (5101), management cost (5141), other income (5501) and total equity and liability (55AA). The business about freight team is not accurately recorded into the system. Furthermore, the sales ledger was not the real income from the sales, but the income after deducted the COGS. On the other hand, this is to say that there is also problem in the expenses recorded within the system.

4.2.2 Findings in information quality requirements

The financial reports of Qiaofule Company fully obey the requirements in accounting information quality; however, these reports are from the purchased accounting service. Within the AIS, accounting information was also recorded by the double-entry bookkeeping method, and could satisfy the principle in the five primary accounting titles. However, the detailed accounting vouchers establishment and classification of these vouchers are not fully compliance on the requirements. Until now, the outcome from the current AIS was only used for the internal management; therefore, its recording method is hard for external users to fully understand about the accurate economic events happened in reality. It is obvious that the requirement was proposed to regulate the financial reporting; while the sponsor company only applied the AIS in reporting the internal resources situation. This formed a gap between the regulated
reporting standard and its own reporting system.

In this term, the current outcome from the AIS cannot be used for externally financial reporting; if the system was not normalized based on the effective accounting standards, especially the financial reporting standards.

4.3 Findings in AIS objective

4.3.1 Objectives for the initial design

Based on the interview with the top manager, the current AIS was designed for a big national trade company in 1991. The initial objectives included computerizing the traditional accounting practices, providing accounting information, and assisting the budget planning. This reversely means that the initially designed AIS has the function:

- to automate the entire accounting processes,
- to generate financial reports,
- to save time in locking and browsing accounting information, and
- to provide information to manage its budget and investment.

However, after the system was applied by Qiaofule, it was applied only for internal management. Based on the interview content with top manager and the definition in Chapter 2.2.2, the primary objectives of the AIS applied by Qiaofule Company are

- provide information to help manage the AR, and
- provide information to help check and control the internal resources of inventory, cash, the bank account, expenditures in various fields and the labor payroll.

To fix the blank in financial reporting, the top manager employed professional accounting agent to generate the reports, but not by employing his own accountant.

4.3.2 Users’ feedback

Qiaofule is an individual-owned small company without long-time loan. In this term, it has no investor, no stockholders, and no creditors. The user of its accounting information may include

- tax authority – tax declaration documents, financial statements, general ledger, journals, and original vouchers.
- Agricultural Bank of China – financial statements, electronic transfer records, and online bank records.
- customers – invoice, billing statements, and shipping documents
- suppliers – bidding documents and purchase orders,
- top manager -data of cash flow, AR condition, inventory number and variety,
annual sales, earnings and profit, and the expenditure condition,
- secretary – data about electronic transfer, AR, inventory, and expenditure
- bookkeeper – data of cash flow, AR and inventory data.

They could be further divided into internal users and external users. Internal users include the top manager, the secretary and the bookkeeper; while the left are external users. Wherein, the tax authorities and the bank of account ask for the financial reports. Because of the financial reports of Qiaofule Company are generated from the outsourced service, but not the AIS; feedback relates to this part are not directly related. Thus, the feedback here will only focus on the feedback to the information that generated from the target AIS.

Based on the content of interviews, their feedbacks and required information are summarized in the following table.

<table>
<thead>
<tr>
<th>Users</th>
<th>Required information</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>External users</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tax authority</strong></td>
<td>original vouchers, transaction documents</td>
<td>The additional original vouchers and transaction documents that were asked to resolve the questions in financial reports and tax declaration documents can help address those problems.</td>
</tr>
<tr>
<td><strong>Bank</strong></td>
<td>electronic transfer records, online bank records</td>
<td>satisfied</td>
</tr>
<tr>
<td><strong>Supplier</strong></td>
<td>bidding documents, purchase orders</td>
<td>no problem in the documents delivery</td>
</tr>
<tr>
<td><strong>Customer</strong></td>
<td>invoice, billing statements, and shipping documents</td>
<td>Sometime invoices were not delivered on time with the goods. Some goods have no billing statement.</td>
</tr>
<tr>
<td><strong>Internal users</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Top manager</strong></td>
<td>cash flow, AR condition, inventory number &amp; variety annual sales, earnings and profit, and the expenditure</td>
<td>pride of the current AIS, as one of the designers; not satisfied with the time to retrieve the information</td>
</tr>
<tr>
<td><strong>Secretary</strong></td>
<td>cash flow, AR condition, inventory number &amp; variety</td>
<td>The system is too big for the current business. Only partly functions were used, like the transaction data recording, the establishment of journal vouchers, and providing information about a few specific items. It should be designed well and could complete all accounting tasks. If there is problem, may be the lack in showing the specific performance; as it only focuses the inventory, profit and expenditure conditions.</td>
</tr>
</tbody>
</table>
4.3.3 Changes on objectives

During the interview, the top manager shows high willingness in establishing his own brand image and bringing a new concept in Chinese grain market. This will extend the existing business and force the improvement of its accounting function and internal management and audit. He and his team needs a normalized accounting information system, which could help his company successfully transform to a medium company with a sound brand image. To come this true, several objectives should be achieved by the AIS:

- Normalize accounting system based on the related regulations.
- Generate financial reports with compliance on the effective accounting standards.
- Enhance the function in monitoring working capital by generating relative ratios.
- Add the function in long-term assets controlling.
- Enhance the ability in the customer relationship management.
- Establish the management of suppliers to organize the new suppliers of grains.
- Provide sufficient information for decision making in budget.
- Integrate the function in procurement, production and sales, by integrating the information within the system.

4.4 Findings within the system

4.4.1 From the macro-view

*AIS framework*

Based on the observation on the AIS, the framework of the target AIS is made up by four subsystems – account setting and maintenance system, vouchers management system, customer and business plan management system, and general ledger/financial reporting system (see Figure 4.1). However, only three of them were used. The customer and business plan management system was not applied into the accounting practice in Qiaofule Company.
As the figure showing, the real structure of the system is not accurately fit to the conceptual framework of AIS; however, it still dominant by the three aspects – GL/FRS, TPS, and MRS. The last subsystem apparently match the GL/FRS dominant; and then the 3rd subsystem is to satisfy the requirement that is conceptually achieved in MRS; while the first two subsystems complete the function of TPS. As the figure showing, there are no more branches under the first two subsystems, only different options for supporting the operations about vouchers establishing, processing, and management. Data input is achieved within the first subsystem, and this subsystem generates different files based on the designed code also within this subsystem (see Chapter 4.2.1 or the original photo in Appendix C). In the file, original vouchers are stored in the way of the double-entry bookkeeping. If the number in the debit-side and credit-side cannot be balanced, the system will refuse the continue processing.

The distributed and stored data will be later exported and imported into the vouchers management system by click the option “机器转总账” (see Appendix D, Photo 1). Then the processing will be automatic. The confirmed data in the second subsystem is exported into the last system, the GL system. This processing is also well-defined and automatically completed. The logic within the each subsystem is reasonable and continuous; however, the 3rd subsystem was neglected within the real implementation.

Technology application hierarchy and status in Chinese small businesses

Based on the new issued subsidy policy, enterprises who established before 2011 and started applying relative software to improve the internal management level can apply government subsidy (see Appendix N). This policy is aimed at guiding the IS application in different levels’ enterprises. Actually, since the issuing of the 12th Five Development Planning, the government has enhances the development, monitoring, and normalization of small enterprises. It defines the objective of developing small enterprises in the next five years, as:

- Maintain steady and rapid growth. …
- Significantly enhance its capability of technological innovation. …
- Industry structure optimized obviously. …
- The application level of informationization has increased dramatically.
- Business personnel quality and management level improved significantly. …

There is no accurate figure for the current application of AIS in enterprises; however, from the objective “enterprise management, and production control reached 45%; the proportion of using electronic commerce to carry out the procurement, sales and other business reached 40%” for the next five years (from 2011), the level of the current level can be assumed as around 15%-25%.

Reviewing the studies in small enterprises AIS application in Chapter 2.2.5, most small enterprises have no AIS within the company; even there is an AIS, its function is commonly to merely automatic the calculation by using computer and replace the traditional manual work.

During the period of observation, the author visited some partner companies of Qiaofule. These companies are also small and lack of systematic integrated management within the company. All of the visited companies have no AIS, and the personnel's educational level was not achieved the higher education level; some even just have primary level. This makes the application impossible in the small enterprises in grain trading field. This kind of environment makes the top manager proud of the current employed AIS.

Have a deeper view of the target AIS, it is a time generation of Chinese accounting software in mid 1990. As the demonstration in Chapter 2.2, China had developed into the accounting software stage (1993-1998) in 1994. The AIS in this time can support different functional models in accounting filed, which is already sufficient for managing the small enterprises daily operations and generating financial reports. From the big background in the worldwide, it was mainly designed with the flat-file model. The data establishment, storage and usage are isolated by the different terminals. There is still some distance between this kind of software and the integrated internal management system. However, as far as the current business, this is enough. In long-term, this kind of AIS will limit the data processing efficiency and then influence the ability in dealing bigger business volume; furthermore limits the expansion of an enterprise in the current business environment.

4.4.2 From the micro-view

Data collection

Data collection was implemented by manual work. The bookkeeper recorded the business transactions daily into the internal standard recording form. The recording form and method was designed by the top manager and trained to the bookkeeper.
Every morning, she recorded the inventory situation from the team leader in the warehouse, as well as the information about the operating expenditure. Monthly received the data about labor payroll from the leader in warehouse and the leader in freight station. The cash movement refers to both cash and the bank account transfer. The bookkeeper recorded the flow-in cash via her and the top manager; while the bank account transfers were recorded by the secretary, manually.

The documents with external data are all under the charge of the top manager. These documents will later be sent to the delegated accountant by the bookkeeper monthly. The bookkeeper, based on the purchase and sales invoices, recorded the cost and income situation. The accounting agency generated financial reports for Qiaofule Company monthly.

Based on the criteria defined for assessing data collection procedures in Chapter 2.3.2, the data relevance and collection efficiency are also important. As to this AIS,

- data relevance is not fully proper
  As it was designed for a big company, who owns bigger volume, more diversified transaction situations, more complicated financial situation, and more requirements in resources control; there are some unnecessary designing, which reduce the relevancy of data input.

- low efficiency in multiple users conditions
  In Chapter 4.4.1, the author has identified the target AIS as a flat-file model, which is known by the stand-alone environment and the needs to repeatedly input the data in different terminals. To avoid the duplication, the bookkeeper and the secretary shared one single terminal. Indeed this resolved the problem in the condition of multiple users; however, it increased the possibility in miss/double input and decreases the efficiency of data collection in another way.

Moreover, some evidence has shown that single one environment is not sufficient enough to satisfy the extended business volume and more complicated customers and supplier’s situation. To resolve this problem, they simplify the recording of original vouchers. This, in reverse, influenced the information quality within the financial reporting. After initiated the business plan, the market would be expected to be largely expanded. At that time, more internal users will be required to work with the system. Then the pitfall in duplicated input will stand out and further restrict the collection efficiency.

**Data processing**

Like other flat-file model AIS, several problems happened in its data process:
- waste of labor and time from duplicated data storage for different function,
- waste of labor and time from duplicated data updating in different terminal,
- questioned information currency because of the problem in data updating,
• higher cost in data management because of the redundant data,
• big constraint in integrating data from different departments.

To reduce the influence of these problems, the top manager asked related employees shared the same environment with the same computer. By this method, above problems were resolved; however, other problems were emerged, like the growth of the company, the more requirement in communication between the related employees, etc. More diversified and complicated business condition tends to lead more tasks in data process, as well as more employees to process these data. The single terminal is not the way to address the problems in data processing from the root.

**Database management**

Although the AIS is file-oriented, it can satisfy specific operations to manage the data input in the system. Based on the explanation about the elements in viewing model in Chapter 2.3.2, three basic functions should be provided – data storage, retrieval, and deletion.

These functions can be implemented within the target AIS. Appendix D shows some similar options under different subsystems with characters “查询”, “浏览”, “处理”, “维护”. They respectively mean “data query”, “data browse”, “data processing”, and “system maintenance”. Wherein, options with “data query” can support the function in data retrieval; and options with “data processing” can automatically store the data based on the defined code and help remove improper data. In this term, the three main functions in database management can be completed. As to the data im-and-export between different files and subsystems, it has already been examined in last section.

**Information output**

Based on the internal standards, the AIS generates report in the cash condition, account receivable, account payable, inventory, income and cost, labor payroll and subsidiaries ledgers.

Based on the characteristics of the useful information, the generated information are assessed within five aspects (see Table 4.2).

<table>
<thead>
<tr>
<th>Relevance</th>
<th>Internal control system</th>
<th>outsourced outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timeliness</td>
<td>so-so, influenced by original voucher input</td>
<td>high, tightly obey the accounting period</td>
</tr>
<tr>
<td>Accuracy</td>
<td>low, influenced by the original documents and the time of keying</td>
<td>so-so, influenced by the documents provided by Qiaofule</td>
</tr>
<tr>
<td>Completeness</td>
<td>so-so, also influenced by the validity of keying the data into the system</td>
<td>high in generating financial report</td>
</tr>
<tr>
<td>Summarization</td>
<td>high summarization for the past business environment</td>
<td>no influence to company’s operation &amp; management</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
</tbody>
</table>

Table 4.2 Generated information quality  
Source from: researchers’ interpretation @ 2013

From the table, we can see the information from these two channels have differences from the basic. AIS was applied for internal control, which is closely related to the enterprise management; while the outsourced outcome was only for financial reporting and tax declaring. From the internal management aspect, there is no need to procure this service; however, the AIS also cannot fully subject the requirement in financial reporting, but very useful to provide information to assist operation or decision making.

4.5 Findings in information flow

The data flows of Qiaofule Company include the grain trade business and the freight team business. However, the freight team business was recorded as other income and other cost. This is to say the business about the freight business was not accurately recorded and reflected by the accounting information. Here only presents the flowchart about main activities in grain trade. This is composed of three flowcharts respectively showing the revenue cycle, purchase cycle and the operations via its bank account (see Appendix M).

From the flowcharts, we can find there are 5 connecters in total. Amongst them, 2 are connected by manual process, 3 are connected by documents. The two worked by connected by manual work will increase the possibility of data distortion or missing.

Then data collections between different functional fields are based manual reporting or informing via phone calls. This restricts the integration of the information continuity and increase the possibility of data distortion and missing.

The data flow within the AIS can be guaranteed by double checking and automatic data processing. However, the outcome information cannot be directly connected to other system, like the tax declaring system. The connection between the outcomes of the AIS will also need to complete by manual work.

Besides the high proportion of manual work, the task segmentation sometimes is also unclear. Based on the flowcharts, task segmentations in manual work were summarized in the Table 4.3. However, this is the idea condition. Problems always happened to the tasks that accomplished by the top manager. Sometimes he forgot leave note for the cash he received or cost, and then there is a gap between the bookkeeping figure and the real amount. Sometimes he forgot to prepare invoice for customers on time, and make the voucher recoding postponed. As the procurement cycle showing, there should be a purchase order that is sent to the vendor; however, in reality, this order is always skip. The inventory management is a traditional problem.
<table>
<thead>
<tr>
<th>Personnel</th>
<th>Task segmentation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue Cycle</strong></td>
<td></td>
</tr>
</tbody>
</table>
| top manager   | • receive customers orders and prepare sales invoice;  
|               | • inform warehouse picking goods;                
|               | • collect bill of order from warehouses leaders and make a copy;  
|               | • send the original BOL to account agency and stored the copy;  
|               | • certificate customer invoice based on the BOL and make two copies, one stored in file and one sent to account agency;  
| bookkeeper    | • record inventory, cash, AR, labor payroll and the fuel cost based on the reported figure;  
|               | • prepare cash journal, cost journal, inventory journal, AR journal, and labor payroll journal,  
|               | • establish vouchers in AIS based on the prepared journals  
| warehouses leaders | • pick goods, arrange deliver team and record stock release;  
|                 | • load goods and prepare bill of order;          
|                 | • deliver goods, collect sales in cash from customers and record operations on notes about the cash receive, labor payroll and fuel  
|                 | • phone bookkeeper and report the note in stock, cash, labor payroll and fuel cost;  
| account agency | • update subsidiary ledgers;                     
|               | • prepare general ledger and financial reports   |
| **Purchase Cycle** |                                              |
| top manager   | • order goods from vendors;                     
|               | • arrange freight team and deliver team;        
|               | • receive invoice from vendors, make a copy, and inform the bookkeeper the cost of purchase;  
|               | • store invoice copies and send original invoice to account agency;  
|               | • collect bill of godown entry, make and store a BGE copy, and send the original to account agency  
| bookkeeper    | • record inventory, freight, purchase cost, labor payroll and the fuel cost based on the reported figure;  
|               | • prepare AP journal, cost journal, inventory journal, labor payroll journal,  
|               | • establish vouchers in AIS based on the prepared journals  
| warehouses leaders | • review and check inventory records;  
|                 | • ship goods to warehouse and prepare godown entry bill, labor for delivery and fuel cost notes  
|                 | • phone bookkeeper and report notes & AP  
| freight team  | • load goods from train cars and record operations;  

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In addition, we could see from the table that the tasks are mainly loaded on top manager and the bookkeeper. Actually, there is a lack in implicitly divided functional departments internal the company. The manager takes charge of the purchase and sales function. This is impossible for more extended volume or more diversified economic events. Actually the long time procurement problem is also related to the lack of relative personnel. Furthermore, if the company wants to initiate the business plan, the function in market or sales department and the function in purchase department are necessary to be enhanced. The current task segmentation seriously limited and will keep constraint the development of the company.

As to the internal communication, they applied the most traditional method - phone calls, to convey most information. This increases the possibility to distort data. To standardize the internal information communicating, standard forms were designed and allocated to bookkeeper and warehouses leaders, which was presented as “note” in the flowcharts. With the application of the notes, specific resources were focused, like cash, AR, AP, inventory, labor payroll and fuel cost. However, even with the standardized information recording method, largely manual work involving still increases the possibility of error. On the other hand, the bank account information was recorded by both the bookkeeper and the secretary. This leaves space for duplication or misses of data input.
4.6 Findings in internal influences

Based on the theories in Chapter 2.4.1, several fields are considering having influence on the performance of AIS. These factors are grouped by the author in the following three aspects.

4.6.1 From the natures of enterprise

Company size

Qiaofule Company is preparing for its expanding, which means the manager expected the company business apparently extended by the new business plan. This requires more employees in the daily operations. The company will welcome a bigger size, and bigger amounts of information that is necessary to be processed. Then the AIS is needed to increase the efficiency to adapt the changing environment.

Now, as the company size is limited, the AIS is somehow enough for the current business volume. Actually, in another term, it also can be seen as the restriction from the current AIS limits the growth of the company.

Industry involved

Traditional grain trading business cannot be apparently distinguished, as the added-value is not sufficient for classifying the grains quality. It was only recognized as the grains from the current year and the ones from past year. For the fresh grains, the price will be a little higher; because more water is saved in the grains, and this leads to higher level of tasty. As Qiaofule Company wants to promote a new concept into the Chinese grain consuming market, this might brings a tide of high-class grain business. This might influence the traditional way for selling grains in China.

As to the company, the production and packaging function tend to be enhanced, which are required to provide higher quality of products. This will increase the transaction processes and more internal management aspects; furthermore, propose new requirement to AIS. More assets are also involved, especially in the long-term. This also influences the company in its resource management.

It is very possible to have more influences on AIS, because of this revolution within the company. However, now, it is hard to predicate; more clear evidences should be again collected after the initiation of its transformation.
4.6.2 From the internal management

Company structure

As the manager is more interested in increasing sales and reducing expenditures, the internal management was not sufficiently. This is common in small enterprises; however, this is one of the main problems to prevent the small enterprises from expanding. The following figure shows the structure of Qiaofule Company.

There are some interesting within the company structure.

- No independent procurement department
  All the purchase of original grains was conducted by the owner. In the past situation, this might be possible, due to the requirement of the variety of materials is very limited. However, if the company want to promote its new products and continuous this series, more suppliers are necessary. At that time, the top manager cannot individually complete the procurement.

- Blank in sales, marketing, and accounting departments
  As the table showing in the Chapter 4.6.3, these tasks are shared by the top manager, the bookkeeper and the secretary. Except some team leaders in operational level (warehouse and delivery), there is no higher level managers to support the internal management. The tasks in these three functions also lack clear segmenting. As a result, the bookkeeper and the secretary often suffer some embarrassing situation that they have no idea what they should do,
nevertheless why they should do.

In the observation period, the company showed obvious weakness, and this is only a part of its quite limited soft power. As the research is relatively part of the preparation for the business transforming, the author felt that the company’s internal organization is not prepared sufficiently for welcoming the expected extending and transforming. Much worse, the top manager had no awareness about the importance of the internal organization, as well as other issues like the personnel training and internal communication. The way that he held all the attention on promoting the new products to occupy the market might provide his idea to other competitors, and finally obsolete this company.

**Management features**

The management within the company shows high centralization. This is presented in the limitation of employees’ power and the needs for the top manager to decide almost all decisions.

The management between different functional departments lacks sufficient and effective communication, especially the communication between the production department and others. Because now the procure function was wholly completed by the top manager; however, once the company started expanding, an independent department for purchasing is required. Then the communication between the purchase and production, and the entire planning of the internal resources are very probably to be challenged; because until the observation finished, there is still no measures that was taken to improve this weakness.

Comprehensively, its internal management shows low-level of integration. This is partially related to the lack of inter communication between each department, as well as the unclear defined functional structure. Whatever, the lack of integrated planning has been influencing the performance of the company; as well as the performance of the AIS, because the requirement for the information lacks identification and leads to unclear objective of the AIS. Then the outcome of the AIS might be useless. Even the outcome is timely and effective, it is still possible to be neglected or misused in the real implementation. In this term, it also relates to the quality of the employees, and this will be discussed in next part.

4.6.3 From personnel issues

**Top manager support**

Top manager has less interest in those that cannot directly generate profit. The application of the current AIS is a coincidence. The system was not especially designed for small enterprises, nevertheless the specific needs of Qiaofule Company. After the long-time developed, the internal user, accurately the secretary, asked for
improving the system; because she thought this is necessary to formalize the accounting function internal the company and make it could support the growth of the company. As the AIS is available, she thought it is better to improve the existing one, rather than going back to the manual work.

As to the top manager, there is a very confusing paradox. One side, he satisfied with the current AIS that he designed; on the other side, he asked to prepare the AIS for the expected transforming. In the author’s opinion, there is a big gap between the functions of current system and the required functions. At least, the top manager would like to improve the AIS, now; but he still wants to control the budget. The specific number was not mentioned in the conversation. The top manager would like to have a general idea about improving expenses firstly, and then make the decision.

*Technical capability of AIS personnel*

There is no professional in AIS within the company. The top manager designed the program; however, his knowledge about accounting is not sufficient enough to support the maintenance and improvement of the AIS. As a result, in the past few years, only the accounts are improved for twice. Except this, there was no more improvement within the system.

*User training and education*

There is almost no training or education for the users of the AIS. The two directly related personnel were not trained systematically within a professional way.

*4.6.4 Some additional considerations*

*Complexity of the required information*

The complexity of the required information will increase. As both the volume and the variety of the grain business are expected to increase, the data that is required to be processed will be increasing, too. To better manage a bigger company, the generated information is supposed to support improving the control efficiency and effectiveness by selecting and summarizing the relative and validity information.

In another term, more functions are or will be established. Then the cohesion between each department tends to be required. This could be achieved by integrating the data/information between different functional departments within a single system, like an ERP or MIS. However, these AISs are reversely too big and complex to Qiaofule.

*Internal resources*

The internal resources influence the performance of AIS from two aspects – the
convenience it supports and requirements that challenge to the internal management. In the first aspect, the available resources in Qiaofule are quite limited. Top manager can provide limited technological support on the legacy system which is also the currently applied AIS, and the system that was evaluated in this research. Budget for improving has no accurate figure, but apparently will not be too much. The time for implementing the improvement is also limited, as the top manager expects to initiate his business plan in this year (2013). As to the requirement, materials’ variety will be diversified, as well as the increasing fixed assets and the investment in production department. More complicated and diversified resources tend to require more specific management in the specific item and a clear view of its specific performance.

4.7 Findings in AIS improvement

4.7.1 About in-house development

The available resources for in-house improvement are limited. First of all, there is no independent IT department, who can provide technology supports. However, the top manager can somehow revise and correct the problem within the current AIS. Then, there is also no enough time for in-house improvement. As to the small enterprise like Qiaofule Company, in-house improvement is not fit. As the comparison table in Chapter 2.6.2, this method is more suitable for big enterprises, who own sufficient information technology support.

4.7.2 About commercial AIS packages

Current commercial AIS packages in China have three kinds, accurately corresponding to the classification in Chapter 2.6.2. The cheapest is the turnkey system which can be directly used. However, its flexibility is the lowest, and users can only use the function within the existing system. It is hard to revise the system or satisfy some specific information requirements. The turnkey systems have different varieties that designed for different industries or enterprises with different sizes; meanwhile it also covers different levels application of IS from single business processing software to integrated enterprise management software (see details in Chapter 2.2.5).

The backbone system are more flexible than the turnkey systems, but also more expensive. Within this kind of system, customers can choose functional modules based on their needs, for instance, the model of labor payroll. The charge of this kind of systems depends on the selected module. Representative IS designers and developers of this kind of system include “YongYou” and “JinDie”. These are the two main companies produce commercial IS packages. Some smaller has “HeZhi”, who is
the new popular in accounting practitioners; because of its convenient, simple and handy design.

Last, the vendor-support system is the most expensive one; however, it is also the one most close to the in-house developing method. By this means, the delegated company will be responsible for the completely designing and possibly the further maintenance of the AIS. This is always used by big companies, who have more unique requirements in information; and only big companies are necessary to invest much on its AIS. The pioneer in ERP designing in China is “YongYou” and “JinDie”. Some international enterprises’ Chinese center also applied the internal ERP, like SAP.

As the illustration in Chapter 2.2.5, “YongYou” is the first AIS software developer in China who stimulate the AIS commercialization and unconsciously lead a revolution in AIS application in China. Until now, there is only one can compete with it – “JinDie”. From the term of the price, “JinDie” is relative cheaper than “YongYou”. Both of them provide diversified products to satisfy different customers’ needs. However, as they are more focus on the development of management software, and the products for big companies; its products for small enterprises exist an apparent problem that the operation is too complicated and not easy handy.

Following, the author will compare some typically designed AIS for small enterprises, which are accepted by many practitioners.

<table>
<thead>
<tr>
<th>Commercial AIS packages</th>
<th>Functions</th>
<th>Price scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>eAccounting</td>
<td>• automatically generates depreciation credentials</td>
<td>free download</td>
</tr>
<tr>
<td></td>
<td>• presets 13 industry templates which cover mainly industries and corresponding sets of accounting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• automatically record vouchers and support fuzzy search shortcut</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• automatically generate the subsidiary ledger, general ledger, and reports only by filling vouchers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• module for account checking clearly records flow of cash in each period</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• automatically generate annual account</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• automatically carry forward the profit and loss</td>
<td></td>
</tr>
<tr>
<td>HeZhi</td>
<td>• automatically achieve vouchers input, review, registration, invoicing etc; and provides a general ledger, subsidiary ledger, journal and cash flow statistics, schedule and so on for convenient querying.</td>
<td>free download, 980-1280</td>
</tr>
<tr>
<td></td>
<td>• provide the required information from multiple perspectives, and automatically perform a</td>
<td></td>
</tr>
</tbody>
</table>
statistical analysis of cash flow
• enhance function in accounting management, cash and bank management, financial reporting, special report generating, and system access monitoring.
• fit to SMEs and any extending small enterprises.

| JinDie       | • provide a variety of functional module that can meet the personalized requirements  
|             | • provide cloud communication for aftercare services  
|             | • enhance function in cash management and financing control  
|             | • fit to production enterprises who also involves procure, sale, and inventory  
|             | 1500-4500 (3-month free trial period) |

| YongYou     | • modules of purchase management, sales management, inventory management, money management, reporting center, stores management;  
|             | • accounting data processes and management; variety kinds of report generating  
|             | • provide managers with a large number of management, decision-making information  
|             | • fit to the extending enterprise integrating the income, expenses, inventory and financing.  
|             | 3000+ (maximum 3-month free trial period) |

Table 4.4 Comparison of four most extensively used small enterprise AIS  
Source from: researchers' interpretation @ 2013

4.9 Chapter summary

In this chapter, the author narrows down to the specific situation within the sponsor company and present the empirical evidence based on the instruction of the conclusion from literatures. These evidences will used to answer the empirical-based sub-questions, and in further assist answering the main research question. The following table is prepared to have a brief review of the findings relates to evaluation.

<table>
<thead>
<tr>
<th>Angels</th>
<th>Elements</th>
<th>Empirical Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>regulations</td>
<td>effective accounting regulations</td>
<td>Qiaofule implement accounting practice based on “the Accounting Standards for Enterprises”, effective from 2007; while the AIS design program based on the previous principle which was abolished in 1999.</td>
</tr>
<tr>
<td></td>
<td>information quality requirement</td>
<td>double-entry bookkeeping, compliance the principles in five basic account titles, detailed accounts are not totally fit to requirements; cannot be used for external reporting immediately</td>
</tr>
<tr>
<td>objectives</td>
<td>AIS objective</td>
<td>original objective + new requirements</td>
</tr>
<tr>
<td>------------</td>
<td>---------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td>users' feedback</td>
<td>external users generally be satisfied, the secretary wants to normalize and fully apply the AIS</td>
<td></td>
</tr>
<tr>
<td>macro-view of system</td>
<td>AIS framework</td>
<td>four subsystems – account setting &amp; maintenance system, transaction processing system, customer &amp; business plan management system, and general ledger/financial reporting system; customer &amp; business plan management system was not used in the accounting practice</td>
</tr>
<tr>
<td>IT application hierarchy</td>
<td></td>
<td>the initial complete accounting software as a generation in mid-1990, China fit to small enterprises, but also limits the growth</td>
</tr>
<tr>
<td>micro-view of system</td>
<td>data collection</td>
<td>high proportion of manual work, redundant account design decrease data relevancy, and low collection efficiency in multiple-user conditions</td>
</tr>
<tr>
<td>data processing</td>
<td>batch processing and support account maintenance; relative high efficiency for the single environment; exist underlying problems in expanded business;</td>
<td></td>
</tr>
<tr>
<td>database management</td>
<td>able to support the function in data storage, data retrieval and data deletion</td>
<td></td>
</tr>
<tr>
<td>information generation</td>
<td>functions of internal control and financial reporting were spilt; the information output from each single channel is relative good</td>
<td></td>
</tr>
<tr>
<td>information flow</td>
<td>flowchart of data</td>
<td>flowchart of revenue cycle in grain trade business; flowchart of purchase cycle in grain trade business; flowchart of bank account operations in grain trade business;</td>
</tr>
</tbody>
</table>

Table 4.5 Brief summary for empirical findings

Findings in the second direction show the other influences on the AIS’s performance. It relates to the feature of the company, the internal management and issue of personnel. These findings reveal the problem in the company’s internal communication and management, as well as the possible impact on its current AIS due to the company transformation.

Last direction of the empirical findings provides a general view of the current account commercial packages in the Chinese market. These packages can support different functions and charge for different prices. This will be used for giving recommendation for the improvement plan.
Chapter 5 Discussion

5.1 Chapter introduction

In this chapter, the findings collected in the former chapters will be implemented to answering the research questions by showing the connection between these findings and the questions. After resolve all sub-questions, the main research question can be answered naturally.

5.2 Relationship between findings and research problems

At the beginning of the literature review, four evaluation dimensions were defined. The further theories and empirical findings are all collected to support the evaluation in these four dimensions—effectiveness, efficiency, reliability, and continuity.

Literature part concentrates on the defining of viewing elements and their function in the assessment. Besides answering the literature-based research questions, this also supports explaining the empirical findings demonstrated in Chapter 4. Meanwhile, theories about organizational influences on AIS and AIS development methods are provided in Chapter 2 to guide the author giving recommendation to make the system better prepared for the enterprise’s expansion and transformation.

Based on the defined viewing elements in the literature, empirical findings were sorted and summarized in Chapter 4. As Table 2.6 “viewing elements functions” listing:

- Angel 1 “regulations” is used to assess the reliability of the AIS, which could answer Question 6;
- Angel 2 “objective” provide standard to assess the effectiveness, which answer the Question 4;
- Angel 3 “technology application hierarchy” and the entire “micro-view of the system” help answering Question 5, by assessing its efficiency from macro to micro;
- Angel 4 “flow of information” and “system framework” in Angel 3 provide findings to answer Question 5, by viewing the possible gap/distortion in the entire flow.

As the research was motivated by the plan to promote new business plan, the evaluation will be processed based on the requirement to well prepare for the coming changes. To make the change more assessable and specific, Question 3 was proposed firstly. Evidences for answering this question are originally from the conversation between the author and the top manager (see Appendix E) and some evidences separately appeared in Chapter 4.
5.3 Answer for empirical-based questions

5.3.1 Question 3

What are the main influences to Qiaofule Company’s AIS?

Based on the empirical findings, the main influences include:

1. enterprise extending will intense increase the business volume and ask for more information processing work (based on subchapter 4.3.3);
2. enterprise extending will diversify the economic events and relates to new subsidiary accounts to truthfully reflect the important transactions (based on subchapter 4.3.3);
3. enterprise extending tends to require improvement the internal management and propose new requirements to the current AIS (based on subchapter 4.3.3, 4.3.2, 4.7.1, and 4.7.2);
4. enterprise transforming requires normalization within the company, including the normalization of its accounting function (based on subchapter 4.3.3, 4.3.2);
5. enterprise transforming requires more effective, reliable and valid internal communication between different functional departments (based on subchapter 4.6.2, 4.6.3, 4.7.1 & 4.7.2).

5.3.2 Question 4

How is the effectiveness of Qiaofule Company’s AIS?

The effectiveness of the AIS will be assessed pre-and-post considering the new requirements on its objectives in figure 5.1. Wherein, “√” means the ability to satisfy corresponding objective’s requirement; while blank means inability. Each item has the same weight in the grading, as they will all required in the further accounting practice.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>ability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide information to help manage AR.</td>
<td>√</td>
</tr>
<tr>
<td>Provide information to help check and control internal resources.</td>
<td>√</td>
</tr>
<tr>
<td>Normalize accounting system and integrate the accounting processes within one complete system.</td>
<td>√</td>
</tr>
<tr>
<td>Generate financial statements and other financial reports which conform to the current effective accounting standards.</td>
<td>√</td>
</tr>
<tr>
<td>Enhance the function of assessing the specific performance (e.g. working capital or even the financial leverage).</td>
<td>×</td>
</tr>
<tr>
<td>Enhance the function in internal resources management (e.g. equipment).</td>
<td>√</td>
</tr>
</tbody>
</table>
Enhance the ability in the customer service management because of the assumed rapidly increasing customer numbers. ✓

Establish the management of suppliers to organize the new suppliers of grains. ×

Provide sufficient information for decision making in the budget and investing plan. ✓

Be prepared for the integration with the sales and market function, which is expected to be achieved by the information integration. ×

Because external users’ feedback is about the outcome from purchased service, their feedback will not be used to assess the effectiveness. However, this can help normalize the AIS account setting, as the external users are generally satisfied with the current financial reports. The feedback from internal users is not valid, as the users have no sufficient knowledge to make a subject judgment. Then combined the weight and score of objectives, its final grade for effectiveness is 7 (10 in total), relative effective.

5.3.3 Question 5

How is the efficiency of Qiaofule Company’s AIS?

The efficiency was assessed from two directions, macro and micro. The micro direction includes each data management procedures within the AIS, which can be assessed by comparing the current performance with the standard efficient processing. On the other side, the macro view defines the AIS within the accounting software development stages in China. By comparing its information application hierarchy with the peer’s condition, the author can have an overview assessment with its efficiency with the standard of peer’s condition.

Each item in the data processing procedures will be equally weighted; and occupies 50% of the total (10). Figure 5.2 shows these performances; wherein, “√” shows positive performance and “×” shows insufficient performance. Then the score for the first half can be achieved. The other half will be got from the macro comparison. The benchmark is the peers’ condition.

<table>
<thead>
<tr>
<th>DATA PROCESSING PROCEDURES</th>
<th>Efficient processing</th>
<th>Actual processing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data collection</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>automatically captured</td>
<td>manual record on note</td>
<td>×</td>
</tr>
<tr>
<td>one time capture for single data</td>
<td>duplicated recorded</td>
<td>×</td>
</tr>
<tr>
<td>proper designed options (high data relevance)</td>
<td>redundant options cost more time in selecting</td>
<td>×</td>
</tr>
<tr>
<td>one time capture for single</td>
<td>one time input in single terminal</td>
<td>√</td>
</tr>
</tbody>
</table>
There are 14 items in total; amongst which, eight are positive and six are negative. In this term, the positive performance occupies 57.143 percentages, which is from the calculation \((8 / 14) \times 100\%\). Combine its weight (50%), the score for this part is 2.86 (from 5.7143 / 2).

Based on the findings in Chapter 4.4.1, the other small companies in the same industry and same geographic field have no one apply AIS within the internal resources control. Even in the whole country, the proportion of the small business applying AIS is also quite limited. Based on the assumption, this figure could be around 20% now. The general level is still stayed in the level of primary complete accounting software. If we only use the former one as the standard, then the score for this part can be as high as 5 (5 in total).

Then add the scores from two parts, the final score for the efficiency is 7.86, comparably high.

5.3.4 Question 6

How is the reliability of Qiaofule Company’s AIS?

Reliability will be assessed by accounting standards, which includes accounting principles and information quality. Six scores will for the six main accounts defined in “the Accounting Standards for Enterprises”, while the other 4 scores will for the defined 8 accounting information requirements. As to accounting principles, only the liability was recorded accurately; thus, get 1 point. Then the information from AIS can
only fit to the Article 13 & 19, which brings 1 more point. Then the score is only 2 in its reliability, which means the reports are not possible to be used by the external users.

5.3.5 Question 7

*How is the continuity of Qiaofule Company’s AIS?*

The system framework and information flowcharts are used as the determination for grading the system continuity.

Based on the findings in Chapter 4.4.1, the subsystems within the AIS are logically connected. Vouchers are required to be established in balance and the information could be automatically sorted and stored based on the account number. Different files for different accounts can be both processed into the GL system. However, there’s no module for connecting the production with the accounting system. Theoretically there should be five functional chunks connected within the system – procurement, sales, production, logistic, and the accounting. In this term, the score of continuity will be deducted 20%, because of missing one of the five, and then only achieves 8 in 10. Also allocate same weights to the framework and information flow, and then there will be 4 scores for this part.

On the other hand, the flowcharts shows that there are 10 functional fields in the grain trading transaction processes, wherein problems always happened in the customer invoice preparation, inventory control, send purchase order, collect cash and record activities via bank transfer. In this term, there are four parts questionable. With equal weight for each functional part, the score occupies 60% (from 6 / 10). However, another business - the delivery services business - of the company was not viewed, as it was not accurately recorded. Weight these tow business equally, then each of them owns 2.5. One missed and the other one achieved. Therefore, the score for this part is 2.5 × 60% = 1.5

Add the former score; the final grade for the continuity is 5.5.

5.4 Answer for the main question

Based on the answers of the empirical questions, the performance could be graded as the table showing.

<table>
<thead>
<tr>
<th>Total</th>
<th>Effectiveness</th>
<th>Efficiency</th>
<th>Reliability</th>
<th>Continuity</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>7</td>
<td>7.86</td>
<td>2</td>
<td>5.5</td>
<td>21.86</td>
</tr>
<tr>
<td>100</td>
<td>17.5</td>
<td>19.65</td>
<td>5</td>
<td>13.75</td>
<td>55.9</td>
</tr>
</tbody>
</table>

Table 5.1 Brief summary for empirical findings

Therefore, the final grade for the AIS is 55.9 (100 in total). Generally speaking, this
AIS is not fit to be continued applied. If the company wants to well prepare for its expansion plan, it is necessary to improve or change its current AIS.
Chapter 6 Conclusions & recommendations

6.1 Chapter introduction

Previously, all research questions have been answered. The performance of the currently employed AIS by Qiaofule Company was evaluated and shown as insufficient for initiating the business plan. However, the evaluation outcome is merely about showing the superficial appearance of the system problem; and it doesn't reveal the root of these problems. In this chapter, the author would like to go deeper from the system weakness to the roots that caused these problems. By this way and only by this way, recommendation could be proposed effectively to help the company well prepare its AIS to welcome the expected changes.

6.2 Conclusions

Conclusion 1: Underlying problems were exposed by the business plan.

Based on the empirical findings in Chapter 4.3.3 and the answer for Question 3 in Chapter 5.3.1, the initiation of the business plan is expected to bring influences on company’s accounting function from the increasing in both the variety and the volume of the economic event.

➢ Variety
  - To improve the package technique, money was consumed on the equipment and the employment of the package technology professionals; and this adds the management activities in its long-time assets and budget plan on R&D.
  - Sales and purchase function will be enhanced, these involve more labor and more complicated situation in customer and supplier management.
  - Products will be diversified as well as the market channels, which will ask for integration of the production planning and better cooperation between different departments.

➢ Volume
  - More customers are involved to extend the marketing channels.
  - More suppliers are involved to support the new products requirement.
  - More products will be produced within the company.

These assumed changes will lead to more complicated conditions in account recognition, measurement and reporting; soaring information volume; and higher requirement in internal communication between each functional department and integrated planning of the complete internal resources. Obviously, these changes will
ask for more efficient data processing method. From the evaluation outcome, we can see that the score for efficiency is 7.86. This score is good; however, if we carefully examine the criteria, we can see this high score is mainly from the terrible conditions within the peer small companies. In reality, the top manager avoids the biggest problem of the system by only using one single environment. Indeed, this resolved the problem in the repeated operations within different environments for different users. However, within the single environment, different users have to wait for using the system, as the environment can only be used for one at the same time. The communication between different users is also required more frequently, as one change the content in the environment will influence others’ operation.

Until now, there are only two users with this environment. It is still manageable. Once the data volume soared, it tends to have more users within this system. Then one single environment must be forced to bankruptcy.

Actually, the root of this problem is that the file-based model is not so fit to the contemporary business environment like its once was in the history. Data processes based on the databases can support much higher efficiency. Although the top manager tries to avoid the system problem, it in reverse somehow limited the growth of the company. The need of expanding and transforming the business is just a turnkey-key to expose this problem. To completely resolve this problem, Qiaofule Company has to do some changes from the basic system design.

Furthermore, based on Jong-min Choe’s study (see Chapter 4.7.2), impact from the company size tends to be positively increasing. This means that if the company expanded as it was expected, then there would be more influence on the AIS than it was in the past business environment. The current AIS might soon expose more problems and restrict the effect of the business plan. In this term, Qiaofule Company is supposed to cautiously review the system problem and the problem that could be revealed by initiating the business plan.

**Conclusion 2: The application of the AIS was restricted from the basis by the lack of normalization within the enterprise.**

From the outcome of reliability assessment, we can see that the information generated from the current AIS cannot be used for the external financial reporting at all. Based on the effective regulation and the requirements for accounting information, its score is only 2 (10 in total). However, it is really useful in the internal control, as the system was applied fully based on the top manager’s needs of information.

On the other hand, the financial reporting function was manually split and delegated to the accounting agency. However, its outcome was never used for internal management or assist decision making. It is only required by external users.
The way to split the function of accounting both in internal management and external reporting is very abnormal. Actually, this is just a little part of the informal behaviors of the top manager, but it has already strongly influence on the formalization of the complete accounting function within the company.

Based on the empirical finding, we know that the current applied AIS can support the function in financial reporting, and it also provides function in maintain the accounts setting and the system setting. This is to say that the current system can fully satisfy the needs of generating financial reports for the external users. It only needs to normalize its accounts within the system based on the currently effective accounting standards.

If the solution can be as simple as this, why they did not implement it? The answer is surprising that the top manager is not willing. As the current standard was established based on his understanding about each accounts, he can fully understand the meaning of the reports from the current system. If the accounts were revised on the public financial reporting standards, the top manager has to repeat the studying about accounts. He thought this is unnecessary and would like to pay to the agency only for fixing the blank in external reporting. If the top manager doesn’t normalize the system for his own convenience, the system will not be possible to be used for generating financial reports, even it owns this function.

On another side, the lack of normalization also refers to its functional structure (shown in Chapter 4.6.2) and the internal communication (shown in Chapter 4.5). Within the company, sales and purchase department are blank. The top manager played the role in both salesman and procurement personnel. Too much work lead to mistake. One side he optimize the internal communication between the bookkeeper and operational teams, by standardizing the record forms and processes to delivery information. On the other side, he did not standardize his own operation as a part of entire chain of the information chain. Evidences showed that mistakes always happened to the task he completed, as he forgot to "note" his behavior. As his expectation for the further business, it is necessary to split his current load in sales and purchase by employing 1-2 more persons. This can complete the enterprise functional structure and make it convention from the internal management. More important, this can support normalizing the internal communication by reducing the proportion of the direct involvement of the top manager in the operational level. He can also have more time to monitor and plan for the company from a higher level.

**Conclusion 3:** Internal environment of the enterprise determines the poor performance of its AIS.

Except the system problem and the restriction from the lack of normalization, the
studies in Chapter 2.4.1 also shows that there are other influences from the organizational context and the implementation procedures on the performance of AIS. Previously, the impact from extending company size was analyzed. However, based on the study of Boczko, which is shown in Chapter 2.4.1, dominants for improving the AIS performance also include the internal management and personnel issue. Specifying to this case, the poor performance of the AIS can be derived back into the intercompany. Based on the instruction of the literature in Chapter 2.4.1 and the empirical findings in Chapter 4.6.1, the author extracted three main dominations that have more impact on the performance of the AIS. They are respectively insufficient support from the top manager, weakness in the internal management and limited capability and insufficient educational level of the relative personnel.

**Insufficient support from the top manager**

- Too much attention was put on increasing sales and reduce expenses, the top manager ignored the importance of improving the internal management, including the AIS application and improvement.
- The top manager has no knowledge in business management, and this prevents him from clearly understanding the importance of the internal management and the sufficient application of information system.
- Top manager has no awareness in the importance of the educational level of the employees and their ability in learning.

**Weakness in the internal management, lack of integrated planning**

- Lacks of clear defined functional departments, especially in the function of procurement, sales, and accounting.
- Lack of internal communication between the technology personnel and the others.
- Lack of integrated business planning and platform for sharing information within the company.
- Lack of diversified management level to distinguish the operations in different levels and support the management in different levels.
- The development of the company lacks normalization and systematic plan.
- The weakness in soft power has already been limited the company growth for several years.

**Limited capability and insufficient educational level of the relative personnel**

- There is no certified accountant, who is familiar with the accounting principles and qualified to generate financial reports within the company.
- The educational level of the bookkeeper is too limited to quickly acquire new knowledge or skills and make it into the real application.
- The top manager is responsible for too much operational work.
- More employees are necessary to support the sales and procure function.
- The task segmentation should be more logical, integrated, and specific; based on clearly defined functional departments.

**Conclusion 4: The application of AIS in Chinese small business is still limited; however, the prospect for developing AIS in small businesses is perfect.**

As the findings in Chapter 4.4.1 present that the Chinese government has been enhancing the development and monitoring of small enterprises. More subsidies are provided to small enterprises and stimulating the informationization within the enterprises of different levels. Meanwhile, government encourages the enterprises transforming to optimize the enterprise structure and internal control.

On the other hand, based on the study in Chapter 2.2.5 and the real investigation of the author in the commercial IS packages market, which can be found in Chapter 4.7.2; the accounting software as well as the enterprise management software has achieved obvious development. Although the functional capability still cannot be compared with the western countries, it is enough to effectively support variety kinds of SMEs’ business needs.

Furthermore, Qiaofule Company has had almost 20 years history, but is still a small company. This is mainly root at its weakness in the internal management. The top manager has shoulder too much loads and made himself have no sufficient time to really make those important decisions for the company. This is common in Chinese small business. As the evidence shown in the literature part, the application of AIS in Chinese small business is quite limited. Even those who applied an AIS, are always have no sufficient ability to fully use the system.

Take the advantage of this business plan; it is time to increase the power of this company from internally. Reversely, this is also necessary to successfully achieve the expected effect in promoting new products series and more important to make the success sustainable.

**Conclusion 5: Qualified personnel are required to fully play the role of the system.**

As early as in the literature part, the author has already shown the influence of relative personnel’s quality on the performance of the AIS; and repeated its importance respectively in Chapter 4 and the former conclusion. Again, because they are the person who directly operate the system and use the system generate required information; their quality largely decides the implementation quality of the system. In china, it is common to have a well designed system, but no one internal the company can fully apply its function, or even just effective apply the system. This happened to
enterprises in any size. Case to the small businesses, this problem might be worse, as their ability to support the expenses of high quality employees is more limited.

Logically, if a new system was applied into the internal management, it is necessary to train the operators to fully play its role; or hire some professional who is handy on the operations within the system. Without these, the system can be only a beautiful appearance without real function.

In this case, similar issue exists. It is hard to train the existing employees to learn a new system; as the individual knowledge and skills cannot afford this. The average age of the existing employees is also too old to learn new things. Qiaofule needs young employees who can adapt to new business environment and has willingness to learn new things. This can be the premise to resolve the implementation problem.

6.3 Recommendations

Recommendations are given based on the conclusions in last section.

*System problems should be reviewed again.*

The problem of the system cannot be simply avoided, if the company wants to be prepared for its extension and transformation. It is necessary for them to review the impact of the duplicated operations on its efficiency, as the single terminal cannot support the huge data volume any more. Then they can be prepared in advance of its AIS, and decided whether a new system is necessary. On the author’s opinion, a new system could be the best way to resolve the system problems. However, the change of enterprise system can be a big issue and trigger more problems. That is why the author only left the recommendation in systematically reviewing the influences of the system problem in the further business life. On the other side, based on the author’s opinion, the advice about changing AIS goes deeper in the latter recommendation.

*It is necessary to normalize its accounting system and functional structure.*

To resolve the problem in the splitting function of internal management and financial reporting, the account system within the AIS should be normalized based on the effective accounting standards and accounting information requirements. This might require inviting a professional or experienced accountant to look over the current account definition, and then help to normalize together. If the top manager would like to hire an accountant within the company, there will be no further problem in establishing account vouchers. However, if the accounting system was only normalized by inviting some professional once or twice, there will still be problem in data imputing; as relative personnel needs to be trained to input the data based on the
new normalized account system. This actually is time-consuming at the beginning. Nevertheless, the bookkeeper has no willing to learn more; and her age doesn’t allow her learn new things quickly. As the time is limited, the author would advise the company hire an accountant within the company. It can also benefit from enhancing the accounting function and make the bookkeeper free to handle other tasks.

Not only should the accounting function be enhanced, as well as the sales and procurement. As the Conclusion 2 mentioned, this is from the needs of the new business and saving the top manager from too much operational works. As the author recommended that an accountant might be necessary. Then the bookkeeper can be free from these massive tiny things. As she has assisted the top manager do the sales already, she can in further fully focus on the sales. On the other side, the accountant will take charge of all tasks in collecting original voucher, operating with the AIS, generating financial reports both for external users and internal users, and check the number of inventory and cash. If the top manager wants to go further, he can also hire one to assist the procurement. However, this one is optional and the author would advice to have a look first. If it was indeed needed, it is also not too late to hire one. The purpose of normalizing these functions is to make the task segmentation more clear and logical, as well as to make the internal communication more efficient and effective. Another expected effect is to splitting the loads of the top manager, and make him have more time to lead the company from a higher level.

*The top manager could consider to have education in business/organization management to assist the sustainable development of the company.*

In Conclusion 3, the author showed the extracted influences from the intercompany view. As to their influences on AIS, it is necessary to optimize these aspects. First and also the most difficult problem is the awareness of the top manager. If the former advices were accepted, then the top manger would be assumed to have free time. Then the author would like to advice the top manager to have some education in business management. The improvement of the top manager, especially in the business management can also assist he convention of the company. He was also expected to learn that how can a leader control and lead the company from a higher level. In term of the enterprise long-time development, the knowledge and skills development of the top manager in business/organization management can also benefit the integration of different functional fields, the coherence within the company, and the management level identification and the task segmentation. At last, the entire soft power of the company can apparently increase.

Following the previous recommendations, the problems in another two aspects can be naturally resolved.
Replace the current system by commercial package.

Indeed, changing enterprise management system is a big issue, and its can relate to many other fields and influence much on the conventional operation methods. However, this is just like a patient with cancer. He might be used to live with the cancer which will kill him at the end. Or he can choose to make operation to cut it. Of course, the operation has risk and changes the way he lived in the past decades; but he can survive and be healthy. The company is the patient, and the system might be a cancer (at least in the author’s opinion). The current system has serious problem in its efficiency in multiple environments situation. However, the single environment will in reverse restrict the company growth. The best way is to bring a new AIS within the company, especially in the current China.

Evidence in Chapter 4.7.2 shows those relative products of commercial information system package are under intense competition in the current Chinese market. The price is much adorable; moreover, most of them provide a trial period from one month to three months. Merely all these products provide standard accounting system within the AIS, and this can save the time to improve the account setting in the current AIS. In addition, the Chinese government is encouraging the informalization in the enterprise management. Based on the evidence shown in Chapter 4.4.1, Qiaofule is fit to the requirement in applying the subsidy from government, if it installed new AIS to replace the current and report its financial situation with the new AIS.

Hire more young and educated workers and establish training/learning system within the company.

As the previous advice stated, that the company needs new bloods to bring energy, efficiency, and new concept in the contemporary business environment into the company. Young and educated workers will be the most precious resources in the company. Simultaneously, a kindly learning environment could also be beneficial, as a way to retain talents; and a well-defined training system can standardize the initial employee training efficient and effective and make the new employees quickly participate to daily operations. However, this advice goes a little too long and can be considered after the company really grow to their expected size and complete the transformation. Keep an eye on the current problem, at least one accountant is advised to be hire within the company, like what has been said in the 1st recommendation. This can help set off much labor and improve the internal communication and task segmentation.

6.4 Limitations

This research is conducted by the western business reasoning logic. However, the
reality in China could be much more flexible and lack of standard. This is especially for the SMEs in China. In this term, when there is no apparent clue to show that enhance the internal accounting function and make it standardized could benefit the company in short-term, the owner may stop implementing the development. Secondly, the owner is eager to promote his new product to the market; he might have no enough patience to wait the establishment of the new AIS. In addition, the budget and implement time could also be tightly restricted in the implementing.

6.5 Implementation

Now there are two things on going. One is the trial of commercial product of AIS, and the other one is to help Qiaofule Company define the account recording in its logistic business.
After compare the commercial product from “e-accounting”, “JinDie”, and “YongYou”, the author recommended “JinDie AIS standard version for SMEs”; because of its reasonable price, sufficient function, and simple operational interface.
The business in logistic is also easy to define. Its sales recorded as sales from logistic services, while the cost of labor and fuel recorded as cost. There is only one problem is about the long-term assets. As the forklifts are not recorded as a part of the long-term assets, it was not depreciated in the past reports. The way to depreciate is still on discuss.

6.6 Reflection

From this research experience, I learnt the importance to clearly define the research scope. This can influence the research conduction very much. For example, what is the AIS that was meant in the research. Now we know it is only about the accounting software that was currently applied by Qiaofule Company. However, during the research processing, as there is a miss in defining well of the AIS, the part of the procured services were covered as a part of the AIS. This distorted the objective of the research and made confusions in understanding the accurate research subject. Furthermore, it is also necessary to clearly define the direction(s) of the research. As to this case, I might define three central research questions and the further sub-questions, if I do it again. One is for the performance evaluation, one for the determinations of the AIS’s performance and the last one for the system improvement. Actually, these three are independent three directions. Although they have inter-connection, it is still better to define them independently. Then the clues can be clearer and the illustration also can be more logical.

In addition, the author also suffered problems in communication. Although said by the same words, the understanding can be quite different. It is better to confirm the understanding again and again with different contexts. This is the best way to misunderstand others. In the research processes, a little misunderstanding can lead to big difference in the final outcome, especially in the initial stage of the research.
the author can do the research again, the communication with the top manager will be improved.

Last, because of too much other work that is not so relevant to the research objective, the time for this research is quite restricted. If the author can do it again, she would like to only focus on the research subjects; however, this also needs to better negotiate with the sponsor.
Bibliography


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郑志伟, 2013. 实施粮食产业化经营战略 推进国有粮食企业集团化发展. 中国粮食经济, 1.

Appendix

Appendix A: Account regulation in “Small Enterprises Regulations”

一、会计科目

会计科目和主要账户处理依据小企业会计准则中确认和计量的规定制定，涵盖了各类小企业的交易和事项。企业在不违反会计准则中确认、计量和报告规定的前提下，可以根据本企业的实际情况自行增设、分拆、合并会计科目。小企业不存在的交易或者事项，可不设置相关会计科目。对于明细科目，小企业可以比照本附录中的规定自行设置。会计科目编号供小企业编制会计凭证、登记会计账簿、查阅会计账目、采用会计软件系统参考，小企业可结合本企业的实际情况自行确定其他会计科目的编号。

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| 46 | 3002 | 长期应付款 |
| 47 | 3101 | 长期借款 |
| 48 | 3102 | 长期待摊费用 |
| 49 | 3104 | 利润分配 |

三、所有者权益类

| 50 | 4001 | 生产成本 |
| 51 | 4101 | 制造费用 |
| 52 | 4201 | 研发费用 |
| 53 | 4401 | 工程施工 |
| 54 | 4403 | 管理费用 |

五、收入类

| 55 | 5001 | 主营业务收入 |
| 56 | 5002 | 其他业务收入 |
| 57 | 5111 | 投资收益 |
| 58 | 5301 | 营业外收入 |
| 59 | 5401 | 主营业务成本 |
| 60 | 5402 | 其他业务成本 |
| 61 | 5403 | 营业税金及附加 |
| 62 | 5601 | 销售费用 |
| 63 | 5602 | 管理费用 |
| 64 | 5603 | 财务费用 |
| 65 | 5711 | 营业外支出 |
| 66 | 5801 | 所得税费用 |
Appendix B: Financial reports form in “Small Enterprises Regulations”

**Financial Statement:**

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减：所得税费用 31

四、净利润（净亏损以“-”号填列） 32
Statement of cash flow:

### 现金流量表

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Appendix C: Ledgers in target AIS

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Appendix D: Subsystems of target AIS

Photo 1 Account setting & maintenance
Photo 2 Vouchers management system
Master in Finance and Accounting
Accounting Information System evaluation and improvement

Photo 3 Customer & business plan
Photo 4 GL & Financial reporting system
Appendix E: Interview 1

Date: 27/05/2013
Objective: Mr. ZHAO Dehe – the top manager and the owner of Qiaofule

Records:

- Could you please briefly describe the business of Qiaofule Company?

I started with my younger brother, who is responsible for purchasing grains from the famers in Heilongjiang Province (HP). I focus on the sales of the grains stored in HP to Huabei Area market (includes Beijing, Tianjin, Hebei Province, Henan Province, Shandong Province, and Shanxi Province), and take charge of the delivery from HP to Tianjin. From 2007, the business in Tianjin got independent by establishing the current company. My younger brother now is my biggest supplier, occupies nearly 80% of the entire goods purchased. About 3 or 4 years age, I started bid the national stored grain; until now this part has been occupied the other 15%. Left are some new suppliers, who I connected since I start thinking the current business plan. We sales them to detailers and the big institutions like school, university, government organizations and enterprises. Besides the grain business, we are also running delivery business. It started from 2006, when we established our first freight team. Now we have contracted the whole freight business from the Nancang Freight Station. We also have our own delivery team. However, normally it is only responsible for the internal work, sending goods to the customers and moving goods from station to the warehouses.

- You mentioned you have a business plan, could you please explain more; and what are expected from this plan?

Every market in China is over supplied. Only those who have new ideas can survive. People have money and want to enjoy higher-qualified life. My business plan is to make the grain products with higher quality. To come this true, we researched the nature and taste of grain, and have been conquering the problem in package technique. You know, this package will assist keep the taste of grains by holding the moisture in the rice. The rice sold in Japan can have very distinguished price, because of the difference in variety and producing area. We want to bring this idea into the Chinese market. We have compared more than twenty kinds of rice, which is most frequently sold in the market; each variety can be also distinguished by the producing area and sub-kinds. Different rice has different taste. This will be defined in our products. Next step we need to find more suppliers to provide sufficient kinds and volume of grain. Meanwhile choose the proper sales channels to promote our new products. As my imagining, this will bring a revolution in the grain market. Especially, after the “Against Waste” police from the central government in last year, only the grain goods are allowed to be sent as gifts within the organizations at the end of the
year. This tends to increase the market needs of the high-elite grain products. We expect to have sharply increased sales, particularly at the end of the year; and apparently increasing in our profit. I hope I could establish my brand image via this time. This may be my last chance to make my company big.

- Ah, I see. Let’s talk something about your AIS. Last time you told me this system was applied from 1995. It is so early, why would you think to apply this system at that time?

I was a computer technique practitioner, before I started my own business. This system was designed for the company I was working for. When I quitted, I was allowed to use this system; however not for the commercial purpose. Then I applied this within my company to help managing the data. This system can be used to automatic the complete accounting system. Based on the documents, vouchers can be established and be compulsory in a double-entry method. Then all data can be automatically summarized and be sorted by the designed account item number. The account number is also fit to the regulations within the accounting standards at that time. The data files can be lead into “GL” system and generate the financial statements. This system supports quickly locking accounting information and management of customers and business plan, by importing and exporting relative accounts data; however, we didn’t use the latter function. At the beginning, it is only a waste of time. However, with the business expanding and the more complicated customer situation, I would like to execute this function; however, the bookkeeper is too slow to learn new things and she has already had many works. Then I gave up this thought. To avoid the risk related to the customers, sometimes I have to control the customer amount into a certain level, and keep obsoleting those with lower credit. This system, in the past, is only for helping my sorting and storing the business information. I want to have the entire control of my assets; so I want this system could show clearly the situation of the money that I should collect, the inventory, the cash flows, the cost and labor I paid annually. Then I could know, which customer I can trust more, which goods are better sold, what cost could be save, and so on. Through this way, I kept my company with profit. However, this also makes me very tired. There are lots of works I need to check and manage. I also cannot use this system generate financial statements. As my knowledge in accounting is also limited, and I could only trained the secretary to input the data based on my understanding; some of data input was not so fit to the accounting standards. The second and more detailed level accounts are also partly neglected within our implementation. Furthermore, I have no certificated accountant, who is qualified to generate financial statements. Thus, I have to hire one accounting agency to help me come out financial reports. Weekly, I sent the original documents to the accountant in this agency; and monthly she assists me in the financial reporting and tax declaration.

- So, what would you want from the AIS after the improvement?
The secretary has been advising me to normalize the account function for a long time. I think it might be the time to do this. You know, to prepare for launching new products into the market. I don’t want to allocate too much budget on the improvement. The current AIS actually can implement all the needs about accounting. I want to initiate the function in information reporting and the management in customers. The most important is to support my activities in the coming extending. I might need the performance evaluation and more information to support the budget decision, inventory control and the production of the finished produced. If it is possible, I want to extend business to e-commerce. I am not sure whether the online data could be directly imported into the system, and the possible cost to establish some interface or other channels within the AIS. Anyway, the point is beneficial for the execution of the business plan.

- I understand. Thank you for your time.
Appendix F: Interview 2

Date: 04/06/2013
Objective: Mrs. FENG – accountant in account agency

Records:

- What task are you responsible?

I was delegated to generate the financial reports of Qiaofle Company, and assist the manager declare the tax within the tax declaration system.

- Will you operate the AIS of Qiaofule Company?

No, I just make the subsidiary ledgers, the general ledger and the financial reports; based on the original evidences sent to me, like the invoice, BOL, bank statement and so on.

- Thank you for your help.

You are welcome.
Appendix G: Interview 3

Date: 06/06/2013
Objective: Miss YAN – staff of Agricultural Bank of China, H District branch of T city

Records:

- What information would you ask from Qiaofule Company?

We check the transfer statements and the records of the bank account. At the beginning, we also asked for the financial statements and some certification about the company. Now, it is so necessary; as we have cooperated with Mr. ZHAO for several years and he is one of our VIP customers. Weekly or longer, we certifies the bank statement by stamping on the printed statement.

- Are you satisfied with the information?

Yes, very satisfied.

- Thank you for your help.

My pleasure.
Appendix H: Interview 4

Date: 06/06/2013
Objective: Miss DONG Jie – officer in tax authority

Records:

- What information would you ask from Qiaofule Company?

We need the financial reports, the tax declaration form, and the proof document for paying the additional charges of VAT.

- Are you satisfied with the information that Qiaofule Company provided?

Yes, commonly there is no problem in the financial reports, as well as the tax declaration documents. One time there is some problem with tax, but it finally was addressed by providing the original invoice.

- Thank you for your help.

You are welcome.
Appendix I: Interview 5

Date: 28/06/2013
Objective: Miss CAI Xuewei – the tax auditor in PwC, Tianjin branch

Records:

- Could you please tell the current situation of the accounting practice of SMEs?

We are not concentrated on the audition of SMEs, actually. As far as know, the situation is still very mass. The tax authority prefers collecting the tax, rather than evaluate their performance. Anyway, it is also infeasible to evaluate the SMEs in deeper; as there are too many SMEs in China. Now, the government encourages people invested into the industry. More Chinese people would like to have their own business.

- How is about the regulation in SMEs’ accounting practice?

From this year, the new document which is intended to the SME accounting practice started be implemented. This accounting standard have defined the six main aspects; and show the government start stressing on the management of the SMEs. However, the thoroughly implementation and normalization of the SMEs’ accounting practice with the international standards still needs a long period.

- Thanks for your opinion.

You are welcome.
Appendix J: Interview 6

Date: 04/07/2013
Objective: Mr. YUAN Xinhui – one of the customers

Records:

- Could you please tell about the feeling of the AIS of Qiaofule Company?

Sorry, I don’t know the AIS.

- Could you please list the information that you required from Qiaofule Company?

I am only interested in the time when my purchased goods can be delivered to my warehouse, and when I can get the invoice.

- Could you be informed the time timely?

Most time yes. However, sometime there is no informing. And the invoice is always not sent together with the goods.

- Do you satisfy with these, I mean the time informing and the documents arrival time?

Generally, yes. Anything else?

- No, thank you.
Appendix K: Interview 7

Date: 06/07/2013
Objective: Mrs. XU Guiying – Bookkeeper of Qiaofule

Records:

- Could you please describe the work you are responsible?

Every morning, from 7.30, the leaders in warehouses and the freight team will report me their operations separately. They make a phone call and tell me the content on their note.

- What is the note?

It is just a form that was asked for record the data of the operation. They were asked to use the standard form to record those data. After report to me, these notes will be kept and stored; in case of the need to check in the future.

- Are you asked to use the same form?

No. As to me, the form is different. Mine form is designed to distinguish the operation in different department. This is the form for Nancang Warehouse (with showing a filled form), and this is the form for New Warehouse (with showing another form).

- So, every morning, you are responsible for recording the data into the form?

Emm, yes; but actually, I will record it on a paper and then recognize the data into different files; and then based on the files, I fill the forms.

- Sorry, could you please explain more detail?

Of course. Every morning, before I receive the phone call, I prepared a blank paper to record the detailed subscription of the operation, for example, (showed a paper) 5th July deliver 500 bags 20kg rice to WCC Wang from Nancang Warehouse, received the cash. I recorded this item on the paper, and then interpreted this into the notebook (show a notebook with different labels). [Within the notebook, there are several account files defined.] You can see, this is the book to record the inventory. [One notebook records the flow in-and-out of different grains, in different date.] This one is especially for recording the account receivable (show another notebook which was labeled by different customers’ names), and I need to collect the cash from the customers. Sometime, the manager will collect the money and inform me; however, most time this is my task. After I collect the money, I will tick the item to show this money was collected and recorded the flow-in cash into the AIS. Then there are also
two notebooks, one is for recording the labor payroll, and the other one is for recording the fuel cost of each container truck.

- Oh, I see. Then you put all data into the AIS?

Yes, previously the secretary is responsible for imputing the data into the system. Then I was trained to input. However, the data what you are seeing now is not the complete. The data related to the electronic bank account transfer is still input by the secretary. She will also responsible for checking the complete data input into the system by the documents that later be sent to her. I only input the cash saving or withdraw.

- So, how long have you used this AIS?

Around four years, maybe a little longer. I think it should start from 2008 or 2009.

- What do you think about the AIS? Do you think it perform well, designed well and provide the information you need?

Let me see. I think it’s good. I have no idea about this. I was just trained to input the data in the way that I was trained. It should be well. At least, when the manager asked me to find some historical figure, I can find it quickly from the system. You know, it looks very complicated. I believe it is good.

- Thank you for your help.

No thanks.
Appendix L: Interview 8

Date: 06/07/2013
Objective: Mrs. WANG Zongyi – the secretary of Qiaofule

Records:

- Thanks for showing me the operation with the AIS.

You are welcome. As you can see, after access into the main page, there are four subsystems support the working of this AIS (point the four options on the operation page). We only use three of them; the “Plan” was never used. Most frequently used is the transaction processing system; wherein, I and Mrs. XU establish the original vouchers for all economic events. The subsystem was designed with the double-entry bookkeeping method; which means the vouchers must be established in couple, one in debt and on in credit to make the figures balance. If two sides cannot be balanced, then the vouchers will be rejected; and we need to re-input the data with the admitted way. The second frequently used function is the general ledger system. You can see from the options in this subsystem, not only the GL, other subsidiaries ledgers are also stored as file into this subsystem. The data input via the TPS can automatically sorted into the corresponding files based on the account item number. We use this subsystem to check the historical data and confirm the quality of the internal resources. The first subsystem (account setting and maintenance system) is also used; however, not so frequently. This helps better defining the account; as the business extended, and the former accounts are not sufficient to accurately show the transactions happened in reality.

- So, what about the neglected subsystem, could you please explain the function of that?

I am also not clear about that. I was never trained to operate that system. Anyway based on the name, it seems to be a subsystem that assists managing the customer and business plan.

- I know the bookkeeper have taken charge of the data input, and the system was operated by both you and the bookkeeper. Could you please elaborate the work you responsible for?

Now I only input the data about the electronic bank account, like the bank account transfer. I will be informed by the top manager to check the returned fund in and the fund to transfer money to the suppliers. Record my operations on note and then input it into the AIS.

- It sounds like that there will not be doubled work between you and Mrs. XU, right?
Actually, we have. Sometime, the top manager’s expense is via the electronic bank account. He will record this on a note; however, sometime he forget recording and then we need to cost huge time in checking where the money went. On the other hand, when Mrs. XU saw the note, she will input it into the system; and I will input it again, when I saw the same note. So weekly, I will print the bank statement and get stamped from the Agricultural bank. Then check each item in the bank account ledger.

- Ah, I see. The last question, what do you think about the AIS?

I think it is nice. You know the system design was designed for a big grain company. All the order and program was based on the accounting standards at that time. It has the complete function to implement the entire accounting procedure. However, this system is too big for our business. Our operations are only referred to the six main accounts and limited number of second level accounts. You see here in the subsidiary ledgers (show the subsidiary ledger list in the AIS).

- Yes, I can understand. Sorry, wait one moment. Why there is no cost of goods sold in the expenses?

Ah, to simplify the operation, we have already deducted the purchase cost for the material out of the revenue. You see the accurate operation need to establish four vouchers, now only two are required. Also to the income and cost with the freight team. That was recorded as “other”, also from the considering of simplifying the data recording. Where did we stop?

- The AIS is too big.

Ah, yes. As to other parts, may be the generated information for evaluating the specific performance is not enough. Now, we have to evaluate the performance based on the basic account figures. And the focus was only placed on the limited aspects, like cash, inventory, profit, blablabl. I am not sure whether it is possible. However, I think maybe I should learn more to make other function working; you see, like the customer management and the business planning. Maybe there are more function could be helpful. It should be interesting; anyway, if I have sufficient time (stress the “if” and smile).

- Thank you for your help.

Anytime.
Appendix M: Flowcharts of information in grain business part
Figure 3: Flowchart of bank account operations in grain trade business.
## Appendix N: Application requirements of special enterprises for government subsidy

<table>
<thead>
<tr>
<th>序号</th>
<th>项目类型</th>
<th>支持范围</th>
<th>申报基本条件</th>
<th>其他条件</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>制造水平提升项目</td>
<td>中小企业采用新技术、新工艺、新材料，开发新产品的技术改造项目</td>
<td>1、具有独立的法人资格；2、成立1年以上（含1年）；3、财务管理制度健全、规范，及时向财政部门报送企业财务会计报告和有关信息；4、生产经营或业务开展情况良好；5、会计信用、纳税信用和银行信用良好；6、申报项目符合专项资金年度支持重点；7、近3年没有因财政、财务及其他违法、违规行为受到县级以上财政部门及相关监管部门的处理处罚。</td>
<td>企业采用与项目相关的有效期内的国家专利（其中购买技术应提供相关购买证明），或者具有2010年以来国家和省级新产品证书。</td>
</tr>
<tr>
<td>2</td>
<td>研发能力提升项目</td>
<td>中小企业购置研发设备、仪器、软件，改造相关场地及设施项目</td>
<td>1、企业采用与项目相关的有效期内的国家专利（其中购买技术应提供相关购买证明）, 或者具有2010年以来国家重点新产品证书、省级新产品鉴定证书。</td>
<td>技术人员占企业总人数比例不低于15%，连续三年研发投入不低于企业销售收入的2%，新产品销售收入不低于企业全部销售收入20%。</td>
</tr>
<tr>
<td>3</td>
<td>专业化发展项目</td>
<td>中小企业为符合国家产业政策的行业龙头企业协作配套，提高专业化发展水平的技术改造项目</td>
<td>1、企业2012年提供协作配套产品的销售额占企业全部销售收50%以上。</td>
<td>企业2011年底前建成，2012年运行良好。</td>
</tr>
<tr>
<td>4</td>
<td>新兴产业项目</td>
<td>中小企业发展节能环保、新一代信息技术、集成电路设计等新兴产业项目</td>
<td>1、企业2011年底前建成，2012年运行良好。</td>
<td>其中的节能环保项目是指列入《国家重点节能技术推广目录》、《工业领域节能减排电子信息应用技术导向目录》，且已进入推广应用阶段的技术和产品。</td>
</tr>
<tr>
<td>5</td>
<td>节能减排项目</td>
<td>中小企业应用节能减排技术和产品的技术改造项目</td>
<td>1、企业应有明显的节能减排效果。</td>
<td>企业应有明显的节能减排效果。</td>
</tr>
<tr>
<td>6</td>
<td>安全生产项目</td>
<td>中小企业改善安全生产条件的技术改造，以及提升食品药品安全水平的技术改造项目</td>
<td>1、企业应有明显的安全生产效果。</td>
<td>企业应有明显的安全生产效果。</td>
</tr>
<tr>
<td>7</td>
<td>信息化应用项目</td>
<td>中小企业应用安全可靠软件和信息技术提高研发设计、生产加工、管理水平，以及软件和信息技术应用服务的项目</td>
<td>1、企业应有明显的节能减排效果。</td>
<td>企业应有明显的节能减排效果。</td>
</tr>
</tbody>
</table>
专利补助项目

中小企业创造和运用专利技术。

企业在2010年至2012年期间获得国家知识产权局授权的专利个数在6项以上（其中发明专利在2项以上），且50%以上的专利已在生产中应用。

小企业创业基地建设项目

为满足小企业创业发展需求，改造现有场地以及相应的公用工程、公共服务设施，新建扩建小企业创业标准厂房项目。

申报项目符合专项资金年度支持重点；7、近3年没有因财政、财务及其他违法、违规行为受到县级以上财政部门及相关监管部门的处理处罚。

服务企业和机构改扩建项目

为中小企业提供技术、质量、信息、集中治污减排等服务的生产性服务企业和机构的技术改选项目，主要为中小企业提供服务的物流仓储条件和物流信息平台改造项目，食品、药品质量安全和诚信平台建设项目。

4、生产经营情况良好；5、会计信用、纳税信用和银行信用良好；6、申报项目符合专项资金年度支持重点；7、近3年没有因财政、财务及其他违法、违规行为受到县级以上财政部门及相关监管部门的处理处罚。

创新、创业服务项目

为小型微型企业提供工业设计、技术开发、技术推广、技术咨询、信息化服务、检测检验、质量控制、设备共享等创新服务项目；为初创小型微型企业提供的创业咨询、创业场地及设施等创业服务项目。

创新服务项目申报单位需为国家和省级认定的示范平台，年服务小型微型企业100家以上，用户满意度在90%以上，对小型微型企业提供的公益性服务或低收费服务要占到总服务量的20%以上。创业服务项目需要年服务注册三年内的初创小微企业不少于30家，对小型微型企业提供的公益性服务或低收费服务要占到总服务量的20%以上。

Figure 4 Flowchart of bank account operations in grain trade business