

The Implementation of CMMI-ACQ into Bank Industries: A Case Study

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ABSTRACT

The services of information department include software development acquisition, development and information service. The information system CMMI[®] for Acquisition (CMMI-ACQ) is introduced to understand the international standard of information system's outsourced acquisition operation flow, which can effectively enhance the quality and effectiveness of planning and the implementation of information outsourced operation, establish fair and reasonable partnership with suppliers, and realize the win-win result for both supplier and buyer. This research analyzed the process of CMMI-ACQ import by the case company in order to improve the outsourced software development, understand the practice, and use it as the basis for popularizing to the delivery system CMMI[®] for Development (hereinafter referred to as CMMI-DEV and CMMI[®] for Services (hereinafter referred to as CMMI-SVC). The case company adopts the implementation procedures of IDEALSM (initial, diagnosis, establishing, acting and learning) to establish improvement plan practice, formulate the conforming standard for acquirer and supplier as reference for the company or the same trade when importing CMMI[®] project. Research findings showed that, standard practice can ensure the project quality of different units or teams even if the implementation method has been changed, improve the possible deficiency, and enable the project to be completed as scheduled. The case company depends on the CMMI-ACQ import experience to establish the optimal development and monitoring management collaboration mode with supplier, thus comprehensively popularizing to all software development operations of this company.

Keywords: CMMI, CMMI-ACQ, case study

1. Introduction

In order to keep competitiveness, financial service dealers establish financial holding companies, compete with the same trade, and set up overseas offices or branches. The application shall be in conformity with regulations and conditions. The safety of customer data and information should be specially highlighted. During application, the internal quality assurance and control is not enough, the application cannot be identified until it gets the

international authentication. During authentication, it will be greatly benefited if improvement and standardization is performed.

In order to protect information from threats and ensure constant operation, the bank hopes reduce the operational risk or loss to the minimum and therefore performs ISO27001:2005 International Standard Authentication for Information Safety Management. Operation shall also be implemented in accordance with laws and specifications. The commodities should be designed according to the operation laws and specifications in order to provide more convenient service. If the customer's trust is obtained, considerable return on investment and commercial opportunity will be achieved.

The case company has the experience of operational loss due to poor software quality and software copyright authorization, so it is found that quality control and management are very important during software development. Excellent software quality can ensure to strengthen commodity competitiveness and customer service satisfaction, decrease manpower, and increase profits and the bank's international competitiveness.

The services of information department include software development acquisition, development and information service. The information system CMMI[®] for Acquisition (hereinafter referred to as CMMI-ACQ) is imported to understand the international standard of information system's outsourced acquisition operation flow, which can effectively enhance the quality and effectiveness of planning and implementation of information outsourced operation, establish fair and reasonable partnership with suppliers, and realize the win-win result for both supplier and buyer.

This research has two purposes: first, analyze the process of CMMI-ACQ import by case company for improving the outsourced software development, understand the practice, and use it as the basis for popularizing to the delivery system CMMI-DEV and CMMI-SVC; second, understand case company's implementation procedures of IDEALSM (initial, diagnosis, establishing, acting and learning) to establish improvement plan practice as reference for the company or the same trade when importing CMMI project.

2. Literature Review

2.1 Management Information System (MIS)

Professor Gordon B. Davis, one of founders of information management subject, Management of Information Systems Research Center, University of Minnesota, defined MIS: "MIS is one man-machine integration system, which provides information to support the organization's routine operation, management and decision-making; this system uses computer hardware, computer software, manual operation program, mode as well as database. The book of Raymond Mcleod, Jr. *Management Information System* defined MIS as one computerized system, which provides information required by the users with similar demand.

MIS means to emphasize how an enterprise effectively plans, organizes, leads and controls the resources, and hope to maximize the utilization rate of the enterprise's manpower, software and hardware, data and network in relation to information system and maximize the return on investment.

One article of the journal *MANAGER* (2011) indicated that, if an organization makes full use of the owned intelligence to judge the market trend and improve information management and analysis method, it can effectively solve the problems.

Weill (1990) though that, strategic information science and technology can create competitive edge, and the enterprise can create advantages by giving customers new service and achieve different segmentations with the competitors in the market; utilization of information science and technology can reduce operation cost during transaction; if the information science and technology development and application system is provided employees of different departments in the company, it will create different values of work.

Therefore, the important goal of modern companies is to utilize information science and technology to develop application system, transform data and information into knowledge, make service extend and enterprise to realize sustainable operation. Good information system and service can result in sufficient information for judgment and strategic adjustment by the organization.

2.2 Bank Information System

Bank refers to the institution that is organized and registered and operates bank business in accordance with Banking Law. Operation business of bank includes receiving check deposit, receiving other kinds of deposit, getting entrusted with manager trust funds, issuing financial bonds, making loans, handling bill discount and investing negotiable securities.

SU Mingfa and FAN Guoliang (1994) mentioned that, compared with other industries, domestic bank is the earliest and fastest industries in computer application. There were only a few industries used computers in the early stage, computer was very expensive and unable to be popularized. Taiwan banking industry has used large-scale host machine with foreign software since 1980s, and made customized revision and developed bank information management system. In 1982, in order to accelerate promoting the financial business automation in Taiwan, Ministry of Finance formulated the implementation schedule for computer online operation in financial institutions. In April 1983, the bank combined with information center to plan and promote the business automation of financial institutions. The Executive Yuan established Financial Information Planning Design Group of Ministry of Finance in October 1984 in order to deal with planning, designing and establishing of financial information inter-bank system. It is planned to divide into three periods, the first is in-bank online, the second is inter-bank online, and the third is electronic bank era.

We have entered the era of electronic bank; customers are using e-bank, the self-service of electronic bank. Network service mode is constantly innovated as well. The role of bank emphasizes payment service. If you want to increase the customer satisfaction, you must attach equal importance on efficiency, convenience and safety. The core service items of the bank have not changed in fact, but service method is absolutely different from the previous ones, this should contribute to the service and convenience offered by information system.

Therefore, in order to unceasingly provide service, the bank pays great attention to the stability and safety of information system and strictly controls information system management. Software development project must understand demand and plan the operation before planning and implementation, and implement project management and monitoring. Banking industry should also incessantly perform improve software quality program in order to improve software quality and increase working efficiency.

2.3 Capability Maturity Model (CMM)

CMM for software is one research achievement for assessing software bid acceptance and implementation ability of software company when United States Department of Defense entrusted Software Engineering Institute (SEI) of Carnegie Mellon University to undertake software bid outsourced project in 1984. The program aims to establish the project system of software industry for individuals and organizations to get the constantly improved basis during software development; it can used to evaluate and improve software development process and capacity during the development of software company, that is, assist to constantly improve software flow mature framework and software quality, improve quality based on flow and quality, and then enhance the company's software development and management capacity, and realize the developed software with correct functions, shorter development period, lower cost and quality assurance optimization.

SEI published CMMI (Capability Maturity Model - Integrated, CMMI) in December 2000, and provided CMMI for the enterprise's standard model can be effectively improved in software development.

CMMI aims to develop a set of universal integration framework to support system engineering, software engineering, software acquisition, as well as product and flow development, integrate particular CMM of different professional fields, and engage in providing the guideline of system engineering and software engineering.

Goal of CMMI is divided into three parts, respectively including quality, time and cost. Unconventional CMMI is only confined to life cycle of software development, and applied in life cycle of engineering design. CMMI is designed according to the organizations of different types, and divided into three constellations, including CMMI-DEV, CMMI-ACQ and CMMI-SVC.

CMMI-ACQ takes user acquisition product, product assembly and service for core business organization as objects. CMMI-ACQ can increase acquirer's management capacity, and contribute to the success of outsourced

project. The implementation methods are designed according to the selection of suppliers, necessary activities signed in the supplier agreement, standard measurement, acceptance criterion and projects delivered by suppliers to manage acquisition discipline of products and service.

CMMI-DEV takes product development organization as main object, which is also used as the standard for purchaser to evaluate supplier (developer)'s flow capacity and organization maturity. It specifies thinking flow as development mode at developer's angle in order to assist the organization to improve the development and maintenance flow of the products and service.

CMMI-SVC focuses on the organizations that mainly provide information technology service for customers. CMMI-SVC covers IT service management, which is prepared by fully utilizing the characteristics of CMMI common model framework, concept and flow fields. CMMI-SVC improvement can provide customers and users with service quality and performance, and can be used to evaluate related service flow and provided as reference for the organizations devote to flow improvement activity.

2.4 Effectiveness of CMM

CMMI contributes to flow improvement mode, which is widely used to improve the development flow of software manufacturer, and used as one technology for software outsourced development acquirer to appraise and elect software development manufacturers. In addition to promotion and application of American national defense industry, some countries have even taken CMMI as national standard.

Table 1 Effectiveness for Importing CMMI

Data Source	Effectiveness Introduction
SEI Analysis Report	<ul style="list-style-type: none"> - Average effectiveness of importing CMMI manufacturer <ul style="list-style-type: none"> • Productivity rose by 35% • Product listing time shortened by 19% • Miss rate after the product is issued decreased by 39% • Proportion between the saved cost and the invested software flow improvement cost is 5:1
Mainland China	<ul style="list-style-type: none"> - Mainland China thought that importing of CMMI international standard is <ul style="list-style-type: none"> • The key to long-term sound development of software industry • The pass of software that participates in international competition • The best way to increasing competitiveness • Able to enhance software quality and productivity and enter the international market - Take Beijing Motorola R&D Center in Mainland China as example: <ul style="list-style-type: none"> • Passed CMM Level 5 Evaluation in 2000 • From 1997 to 2000 • Average productivity per person increased by 6 times • Miss rate of development process decreased by 15 times • Miss rate after software is issued decreased by 24 times
India	<ul style="list-style-type: none"> - Introduced CMMI technology in 1991 to encourage manufacturers to achieve evaluation qualification. - Highlight software development program and quality control, acquire the trust of international customers, build competitive edge, and become the second largest software producing country second only to America. - From 1999 to 2004, about 16% of global software development projects could be completed as planned. Over 95% of the projects completed in large-scale software enterprises of India can be completed under the contract, indicating that control ability implementation of the Indian software companies concerning time, quality and cost is effective. - Indian software industries increased by 50% per year. The total production output in 2000 is US\$8.3 billion, 2.8 times of Taiwan.

Summarize SEI Analysis Report, Analysis Report of Beijing Motorola R&D Center in Mainland China (passed CMM Level 5 Evaluation in 2000) and Actual Situation Research Program Report of CMMI Promotion in India of Institute for Information Industry, and explain the effectiveness of CMMI importing in Table 1.

Considering the present domestic enterprises that have passed CMMI Authentication and received instructions in the Improvement Program of Industrial Development Bureau, Ministry of Business Affairs Productivity, China Information Software Association analyzed in the aspects of customer, cost, project and organization, and judged CMMI has positive effect on the enterprise's flow improvement and sense of identity of quality assurance after CMMI is imported.

Based on the above statement as well as the effectiveness analysis that is from SEI Institution, internationally authenticated and from Taiwan, we can understand that, the development capacity maturity capacity of CMMI organized and developed in the company will generate positive effect on the enterprise's flow improvement and sense of identity of quality assurance. For example, project development that can be completed according to the required time limit and quality, quality that can be improved, customers and employees satisfaction that can be increased and cost that can be reduced due to increase of flow efficiency and quality will get the self-identity of the international market, and will be regarded as the pass for entering the international market.

3. Research Method

Case study is the detailed inspection for one field, single individual, document and data repository or one particular event. - R.C. Bogdan (2002). Case study refers to the method of collecting effect and complete data by all means and making meticulous and profound research for single individual, event or social unit. Therefore, case study lays particular stress on discussing current events or problems, especially emphasizing the profound and specific discussion on truth of event and problem's formation reason. The research usually focuses on understanding event or phenomenon process instead of consequence, and paying attention to understand event or phenomenon's details rather than special variables with the overall viewpoint.

Case study discusses the activity peculiarity of one case under particular circumstance, and the process of case study has purposes at deep level, such as finding out the problem reasons, proposing problem solutions, providing prevention measures, enhancing the performance of organization and institution, providing specific cases, assisting case development potential and offering the hypothesis source.

This paper will use the case analysis in qualitative research as research method, and the discussion is to deeply understand CMMI importing course of case company, the discovered problems and solutions. Case study approach is used to depend on CMMI importing course of case company and the effect after case company imports CMMI to propose effect solutions for the future potential problems, and increase the performance of organization.

4. Case Analysis

4.1 Brief Introduction of Case Company and Information Application System

The case company was established in 1919, which was transformed into financial holding company in 2001 for the purpose of coordinating with the governmental financial reform policy, suiting for financial environment change and reaching the goal of conglomerate operation effect.

The case company mainly handles business scope stipulated in Banking Law and coordinates the policies issued by authority. In order to simplify the operation of business unit and decrease manual processing, nearly all businesses have been put into computer system management. Since 1970s, large-scale IBM host machine has been used, and information application system began developing. The core systems contain deposit account system, loan account system, accounting account system, gold business, safe deposit box, funds system, online central log-in bonds business of Central Bank, national treasury incoming and outgoing business and same-capital system, and online business of financial information service company including inter-bank correspondent, chip financial card, salary distribution and payment of water fee, electricity fee, income tax, financial EDI, financial

XML, national tax payment platform and Unionpay, and collection bill of clearing house, ACH distribution and deduction operation, and online clearing bank of Taiwan Securities Central Depository Company that plays a role of online clearing bank and transaction bank and provides short-term ticket.

Due to the development of information and communication, bank service channel is equipped with self-service on customer end, transferring counter transaction to network bank or mobile bank end. In order to reduce manpower operation cost, decrease information data error and risk, increase efficiency of employee service and customer satisfaction, the case company must rely on information system service to provide diversified service. Therefore, senior officers also pay great attention to information software quality.

Information application system has outsourcing mode and independent establishing mode. After the application has been developed, it should be confirmed, and then it will officially put online for providing service. Financial service is related to benefits of customers, so software quality is very important, the result must be correct and real-time. Software Development Department highlights software quality, which has developed quality improve program since 2009, and established framework group and software quality management group. Organization framework group will formulate program and provide project reference activity documents for the existing software development flow. When formulating software development, software quality group should submit demand analysis report, system design report, system design specification, program design specification and test plan and online plan. Key elements in the document should be confirmed in order to assist organization documents to be simultaneous, and able to establish the template and monitoring mode of the future new application system for project development and improvement when providing future new system planning for template of organization members.

4.1 Case Company Imports CMMI with IDEALSM Method

When the case company decides to use CMMI mode, the case company will use IDEALSM mode for the imported plan, and formulate objectives according to the organization demand to perform the internal improvement program, and pursue constant improvement strategy.

4.1.1 Initiating of the case company when importing CMMI

In recent years, based on the operation demand, the establishment conditions for overseas branch banks and banks shall be in conformity with the policy, domestic laws and local laws, and the banks shall be opened up after the application is reviewed and approved. The common phenomenon discovered during establishment application is great attention on system information safety in different countries.

However, when applying for setting up overseas branch banks, the preparation of relevant application documents must be in conformity with the constraints and requirements of the local law, such as some explanations proposed concerning the management method of customer data management. Therefore, we should understand that, in order to meet the demand of all countries for information system management and information safety, the international standard must be follows as implementation basis, and the common standard can be formulated for communication when entering the international market in the future.

Software development program contains software development, hardware establishment and maintenance, and operation management and adjustment. The case company has carried out ISO27001 Evaluation recently for intensifying internal control and risk management, and software development acquisition is imported with CMMI-ACQ ML3 mode in conformity with the international standard. During importing and evaluation, this aspect of knowledge is established for organization members, and the management can be standardized, enabling the case company to understand the international standard specifications and improve the existing flow management for improvement.

The experience of independently developed software is insufficient, new system or new function had mistakes when it was online, possibly because the demand was not clear or the program quality or software quality was unfavorable, and online management flow has errors and suffered from loss. It usually took more time to recover when the errors happen.

When importing CMMI, because it is necessary to change the current situation and take the suggestions and standard as scope proposed in CMMI, the organization members are bound to resist, the support and insistence

of higher management must be needed during development to authorize and provide relevant resources for smoothly completing.

4.1.2 Diagnosing

The main focus of CMMI importing is on the improvement of organization flow. Flow improvement must be helpful for organization and business, and improvement is often the long-term and strategic work. The advantages of flow improvement include increasing the forecast capacity of period and budgeting, improving product or service design period, enhancing productivity, improving quality, increasing customer satisfaction, reinforcing the morale of employees, increasing return on investment and decreasing cost caused by quality.

Selecting appropriate model is the essential condition for the successful flow improvement program, CMMI-ACQ model mainly focuses on initiating and managing the management acquisition activity. When selecting to import the model, the organization's proper project and necessary course should be considered to satisfy the main focus of business objectives.

The case company will decide to apply for CMMI evaluation, flow improvement procedures are main tasks of information planning department, outsource the business of project acquirer, select CMMI-ACQ capacity maturity, make stage presentation of LEVEL 3 as improvement objective, select one pilot project and invite domestic experts to assist import in the initiating stage.

Information operation development of the case company is different from outsourced and self-control methods, which provides software service, and analyzes according to the current situation of case company in using software development and maintenance management operation flow.

According to the analysis of practical flow, after business unit proposes the operation demand, information unit (acquirer) will perform acquisition, after project manager understands the demand, the project manager will analyze the review for acquisition planning, RFP, supplier solicitation, supplier selection, project leading, management and monitoring until the system is transferred to be online, and this part belongs to CMMI-ACQ. From supplier selection to system acceptance, the outsourced software manufacturer must be led, managed and monitored by acquirer. The activities in this period contain Project Planning (PP), system analysis, system design, software development, test and delivery, and this part belongs to CMMI-DEV; when the product is delivered to the acquirer's system environment maintenance and transport unit for service resource management and service level management, this period includes service planning, service demand analysis, service management system, service transfer and issuance management, and this part belongs to CMMI-SVC.

4.1.3 Establishing

After getting the support of officers in the organization, project group was established. This group can provide the resources for promoting CMMI import, and assist to eliminate the potential troubles impacting the promotion of this project. Regularly hold meetings to understand this project's promotion schedule, coordinate with department staff to implement the plans of this project. Initial objective is to select one pilot project that is outsourced for development and import in CMMI model, and formulate the objective of 6 flow fields, including PP, Project Monitor and Control (PMC), Solicitation and Supplier Agreement Development (SSAD), Acquisition Validation (AVER), Configuration Management (CM) and Measurement and Analysis (MA). Except SSAD, the remaining 5 flow fields will refer to the implementation requirements of CMMI-DEV and CMMI-ACQ constellations in the same time and promote implementation steering. In this stage, the case company decides to use the current situation of pilot project import as evaluation and improvement standard.

The consulting firm shall assist import process, implement the pilot project as an expert and reviewer, look for proper solutions, take "the measurable general flow improvement objective defined in the initiating stage" as project objective, hope to generate the monitoring standard principle and document in the organization, establish the common view of organization staff on the basis of this standard in the future, finally approve software flow improvement strategy program, and deploy the resources and action plan for the action. Therefore, the implementation in this stage is the third stage of IDEALSM - establishing.

4.1.4 Acting

Acting means that pilot project members of the case company implement project pilot activities according to the practice methods and requirements of the selected 6 flow fields for implementation.

The case company shall select pilot project, and entrust the development manufacturer that has passed CMMI-DEV ML 3 Evaluation, and then invite consultant to assist the case company to import CMMI-ACQ ML3. The consulting company shall provide SEI CMMI consulting service, and define the time limit for staff training, flow pilot and project settlement operation.

The pilot project operation management group is separated into project leader, project manager, technological framework, group state management group quality assurance group, technological demand, VER and acceptance test groups. The project members of the groups shall cooperate and implement according to roles and work division. After project organization confirms and appoints responsibility, the members should have project knowledge and skills.

The activities in implementation period are divided into 7 parts. First, prepare pilot operation, before implementation of pilot project, establish Management Steering Group (MSG) consisted of management layer, in charge of deciding steering tasks of different departments, regularly holding pilot project meetings, managing steering implementation state, and assisting to solve steering problems. Second, plan for steering, establish pilot project implementation program, and provide the resources for project program activities. Third, perform staff training that includes CMMI concept and practice method. In order to understand CMMI's specification for software development program specification and requirements for outsourced service, the members shall receive the educational training operation, form files used in the explanation session, methods and implementation steering. Fourth, implement steering and pilot activities to develop with low grade or without the operation program. The development includes establishing estimated project scale, period, project management program, RFP standard template, monitoring supplier's activities, producing project state report, reviewing documents delivered by supplier, and establishing project documents and record management mechanism. Fifth, settle the pilot project, sort out pilot project records, specification document data, and configure Flow Asset Library (PAL) of management system. Sixth, promotion implementation: try and adjust operation program and methods, and finally evaluate implementation effect, and decrease losses.

Difference analysis contrast shall be made between difference analysis implementation method, program documents, instructions or methods defined according to Article CMMI-ACQ ML3, form documents and the case company's application software development and maintenance management operation flow, instructions or methods, and form documents. If it is found not to reach CMMI-ACQ Article ML3, the specific operation requirements or methods have not been formulated in the technical description of software development life period, lacking program and form document standard. Part of operation lacks activity record, without providing the actual documents, records or system operation process, lacking technical description documents in the existing software development life period, therefore, the same project activity implementation result is not same and not stable, generation description is not same or lack activity evidence, lacking the methods, evidence and other results required for project management.

Start with project management program, establish measurement analysis according to the pilot project, refer to the consultant to provide the standard documents in conformity with CMMI, formulate measurement projects for completion as scheduled, documents and program quality, demand change, problem management, risk management and other projects; regularly hold project management meetings, including management review meeting (2 months), review point meeting, business meeting (monthly), project weekly meeting, manufacturer review point meeting and manufacturer project monthly meeting.

Considering engineering management program, perform document VER management, change management, system analysis management, system design management, application software development test management and acceptance transfer management; adopt VER or confirm review method, distinguish document missing, and correct before passing.

Regarding support management program, make sure to carry out data management, configuration management system and access right management. Data management includes configuration project coding, record coding, convenient for managing the configuration project and working records generated from projects. Structure of

configuration management contents include version management area, standard management area, record safeguarding area, work management area, document review area and test implementation area. In addition, establish self-review mechanism, implement external review operation for the outsourcing manufacturers, make the review results into analysis report, report to project group, and project group will determine the requirements of corrective measures, and trace the management in project monthly meeting until the end.

4.1.5 Learning

When implementing project activities according to CMMI requirements, if the operator is unfamiliar with CMMI implementation method, process and requirements will cause significant impact on human resource allocation, project period and labor division, as well as project period extension. The members are unfamiliar with the requirements of some software engineering methods, manpower and time for implementing pilot project activities that is more than the estimate, and it is unable to effectively use CMMI implementation method to reach the expected results. The relatively unfamiliar methods and technology include project scale and period estimate, risk management, AVAL, PP and measurement analysis.

Through document VER and AVAL, document quality management can assist to discover and distinguish document missing in an earlier time, reducing the possibility of program revision and change in the acceptance online stage due to unclear demand or wrong description, and more effectively control project period and program quality.

The members who participate in pilot projects are limited. The pilot project implementation results should be transformed into internal implementation consensus, and project members should hold internal meeting to explain pilot project implementation process and achievements for related personnel and authority, and acquire most extensive support.

4.1.6 Collect import explanation

CMMI-ACQ module flow is complicated, so it is suggested to use flow management system for management, and establish application software outsourced development and maintenance service operation according to the program. After the results of program and form document standard, activity record and activities are generated, they are in conformity with management of documents in all stages, and they are miscellaneous and complicated, the consultant suggested establishing project management knowledge library to standardize the program and properly safeguard the documents, and even become project management knowledge library in the future. The organization can make knowledge transfer for the project development program or implement educational training system.

Therefore, during practical operation, flow management was really found to be complicated and full of documents, the colleagues reflected it was truly unable to practise according to the project flow, thus the document management knowledge library was purchased. Project leader shall establish particular project knowledge library, and shall be able preserve version, transaction document log and retrieve record, so as to remind colleagues performing flow operation.

Difference analysis of program indicated that, organization interior lacks program, form document standard and activity record at present, and the activity results are not same. In order to solve these problems, the case company has implemented research and discussion for operation programs in different stages, formulated standardized operation program and document form according to the CMMI requirements, established review group, unified the format of the delivered documents, set up version control for the documents, and established the sharing knowledge library.

After difference analysis contrast results are generated, the case company will start on difference improvement activity like Acting in IDEALSM, project members will raise problems according to the consultant, propose improvement program, and hope to make pilot operation after announcement. After the solution is proposed and before it is implemented, make announcement and know whether it is proper through the reply of each unit, then revise the template before popularization and implementation. After trying the possible solutions, pick them up and popularize the approved solutions to the whole organization.

5. Discussion

The case company shall gradually implement CMMI-ACQ program according to the preferential projects, and take the following steps for improvement:

- (1) Establish project RFP, and let it become the supplementary attachment of RFP according to project management and operation demand, and use it as the implementation and management reference for project implementation.
- (2) Establish project configuration management mechanism and system, establish management method and configuration management system generated from projects, manage project documents and records, including the documents, records and programs delivered by project supplier.
- (3) Establish project measurement and collection mechanism, set up project management objective, select measurement project, and determine measurement data collection method.
- (4) Use CMMI PMC method to monitor pilot projects, and adopt PMC method to review project supplier to regularly provide weekly pilot project state report. The report should include PMC requirements. Use PMC implementation requirement process to understand how to use PMC implementation requirement to manage software development and the outsourced projects.
- (5) Use CMMI AVAL method to implement confirmation and review operation. Use AVAL review method to review the important documents submitted by project supplier, including AVAL planning, implementation, record and analysis.
- (6) Compile project RFP, establish software outsourced development RFP standard template according to CMMI SSAD implementation requirements as the standard document for the follow-up software outsourced development and maintenance service.
- (7) Compile project management program, collect the experience and information of all projects, and establish software development project management program and software outsourced project management program standard template according to CMMI PP implementation requirements.
- (8) Collect project data, sort out project data, establish project PAL, provide follow-up project for reference.
- (9) Establish project settlement report. The project will provide CMMI practice experience. After these experiences are settled, they can become the precious assets for constant application of CMMI in the future.

Use CMMI PMC implementation method to carry out project schedule monitoring. The actual schedule lags behind program schedule and the effect of project management is not as good as the expected state. If the project is unable to be completed before demand confirmation and system analysis during software development, the backward state of project period cannot be improved, and the possibility of the project realizing the object when the program completion time expires will reduce, so the project manager should submit this problem to the higher management to look for the solution or change project implementation program.

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