Full Length Research Paper

Taxonomy of cost of quality (COQ) across the enterprise resource planning (ERP) implementation phases

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Companies declare that quality or customer satisfaction is their top priority in order to keep and attract more business in an increasingly competitive marketplace. The cost of quality (COQ) is a tool which can help determine the optimal level of quality investment. COQ analysis enables organizations to identify measure and control the consequences of poor quality. This study attempts to identify the COQ elements across the enterprise resource planning (ERP) implementation phases for the ERP implementation services of consultancy companies. The findings provide guidance to project managers on how best to utilize their limited resources. In summary, we suggest that project teams should focus on "value-added" activities and minimize the cost of "non-value-added" activities at each phase of the ERP implementation project.

Key words: Services, ERP implementation services, quality standard, service quality standard, cost of quality, project management, project quality management, project financial management.

INTRODUCTION

Enterprise resource planning (ERP) systems are integrated information systems that are enterprise-wide. These complex pieces of software have become integral to corporate business operations, since they enhance organizational cross-functional efficiency and effectiveness through the seamless integration of all the information flowing through a company (Davenport, 1998a, b).

However, the implementation cost of an ERP system is very high, and it can be hard to justify the costs and benefits of the system. Many ERP implementations have been difficult, lengthy and over budget; consequently, they were terminated before completion, and failed to achieve their business objectives even a year after implementation (Somers and Nelson, 2004; Peterson et al., 2001). According to the project management body of knowledge (PMBOK), there are nine knowledge areas related to project management.

These include project integration, scope, time and cost, project quality, human resources, communications, and project risk and procurement. The definition of "triple constraint" is project scope, time and cost. If any one of the three factors change, at least one other factor will be affected (PMI Standards Committee, 2004). In particular, quality will be affected. Quality is the degree to which a company is able to fulfill customers' requirements. To achieve quality, project managers need to complete customers' stated and implied needs within scope, on

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Abbreviations: COQ, Cost of quality; **ERP,** enterprise resource planning; **PMBOK,** project management body of knowledge; **WBS,** work breakdown structure; **PAF,** prevention-appraisal-failure; **ABC,** activity-based costing.

time, and within budget. It follows that project managers have to balance the competing requirements of quality, scope, time and budget to meet their project management goals. Quality management complements project management. Project quality management processes include quality planning, quality assurance and quality control. Quality control represents an increasingly important concern for project managers, who are responsible for monitoring project results to determine whether they comply with quality standards. Project managers also need to identify ways to eliminate causes of unsatisfactory results, since defects or failures can result in increased costs and delays. In the most severe case, project failures may put a stop to company operations. Good project managers try to ensure that jobs are done right the first time and that no major surprises occur during the project life cycle.

As with cost control, the most important decisions regarding the quality of projects are made during the planning and design stages. The cost of quality (COQ) as an accounting technique was introduced by Juran in 1951. In 1956, quality costing as a quality management technique was introduced by Feigenbaum (1956). Since then, monitoring and controlling COQ have become critical activities of quality improvement programs. Identifying COQ can provide a standard measure used to manage and measure it. It also can build the awareness of the importance of quality and help to identify improvement opportunities. Most companies have set up the processes and procedures that each project needs to follow and many of these procedures are also developed to mitigate risks. There is a wide variety of ways in which an organization can set about collecting and measuring quality cost, and some of these approaches will be introduced later in this article. The purpose of this article is to identify major activities related to COQ in ERP implementation phases. We also describe the financial and quality management of project practice in big consultancy companies. The most important decisions regarding the service quality standards of a project need to be made in the planning (project preparation phase) and design (business blueprint phase) stages. These service quality standards are important in preventing project failures from occurring in subsequent stages.

The remainder of the paper is organized as follows: Subsequently, this study introduces the project life cycle of ERP implementation, after which the concept of quality was defined. Later on, it introduces the concept of COQ and discusses the project financial management practice in big consultancy companies. Furthermore, we explore project quality management practice in big consultancy companies. Finally, the conclusions were presented and suggestions were made for future researches.

PROJECT LIFE CYCLE OF ERP IMPLEMENTATION

The major activities of ERP system implementation are different from the traditional development activities of system analysis, design and programming. Most consultancy companies have developed their own ERP implementation methodologies for ERP implementation services, and they have gained from experience and make continuous improvement on their methodology (Tsai et al., 2011a,b). This is a proven and successful approach to implementing ERP solutions that can help to deliver a project on time, within budget, and minimize risks. The big ERP system vendors include SAP and Oracle. The SAP company has proposed the ASAP (Accelerated SAP) methodology which has five phases. These are referred to as follows: Project preparation, business blueprint, realization, final preparation, and go live and support.

Project preparation phase

During this phase, the project team goes through the initial planning and preparation for the ERP project. The major activities are to establish the goals and scope of the project, high-level timelines, project charters, the implementation strategy, and the project team, as well as to prepare the office and equipment and to arrange a kick-off meeting.

Business blueprint phase

The purpose of this phase is to achieve a common understanding of how the company intends to run ERP to support their business. The business blueprint is the final result. During this phase, the project team will identify and document business requirements and goals to establish the ground for future stages of the project. All processes must be discussed and documented. A "sign-off" is required at the end of the phase to ensure that an agreement has been reached for the complete scope of the project.

Realization phase

The purpose of this phase is to implement all the business process requirements based on the business blueprint. A "baseline configuration" is established first; then, its functionality is tested with all necessary changes made to the baseline configuration as a result of the testing. This phase will be closed with a "final configuration" indicating that all business processes outlined in the business blueprint documentation have been captured in detail and configured into the new ERP system.

Final preparation phase

The purpose of this phase is to complete the final preparation before the system goes live. It includes making

sure the production system environment is ready, ending user training, carrying out the cut-over plan, etc. All critical open issues should be resolved during this phase.

Go live and support phase

This is the final phase of the project where the newly implemented ERP system is declared as "live" for daily business operations. Production data will now be inputted and processed by users as part of their duties and daily routines. All issues that arise will be documented, supported and resolved.

METHODOLOGY

We list the major activities at each phase of ERP implementation in Appendix Table 1. The data was collected from related books, publica-tions and the opinions of consultancy project managers. Project managers plan the detailed project schedule based on the work breakdown structure (WBS) of their company's ERP implementation methodology. The continuous improvement and proven methodology of the ERP system can make the project activities and cost estimation more accurate and achieve the project's objective on time and within budget.

The business blueprint phase is the most important and critical phase of ERP implementation. Project team members need to make sure all business processes are discussed, and they have to reach a consensus on how an ERP system can support their business operations and ensure jobs are done right the first time.

Quality

The most basic definition of quality is conformance to standards or requirements (PMI Standards Committee, 2004). The British Standard Institute defines quality as the "totality of feature and characteristics of a product or service that bears on its ability to satisfy stated or implied needs" (Ellis, 1993; Wang and Pho, 2009). Customers define the service quality (Wannerburg et al., 2009), while the service quality should fulfill customers' needs and expectations (Tan et al., 2010), and has positive effect on both customers' loyalty and satisfaction (Boshoff and Gray, 2004). Others define it as "doing it right the first time" or "fitness for purpose" and "zero defect" (Deming, 1986).

There are no fixed definitions of quality, but rather concepts of quality. Quality, however, should not be confused with excellence or luxury, which may be costly, but will not necessarily conform to the customer's needs or improve customer satisfaction. True quality means "value added" to the customer. "Quality is free" – if we do things right the first time then we don't have to pay to find or fix the defects (Corsby, 1979). Greater efforts in monitoring and enhancing quality will inevitably incur greater costs.

Quality should be designed into goods or services (Juran, 1992). Most companies know poor quality causes an increase in costs that is significantly higher than the costs required building good quality into the design.

Cost of quality

The concept of quality costs was first described by Feigenbaum (1956), who used this term to refer to the total cost of quality-related efforts and deficiencies. The COQ methodology is introduced in British Standards BS 6143, Parts 1 and 2. Specifically, the process cost model and prevention-appraisal-failure (PAF) model are introduced (BSI, 1990, 1992). However, as stated in the introduction, there are many other ways in which a company can collect and measure quality cost. Regardless of whether the approach is based on the PAF model or another form of categorization, such as the price of conformance and price of nonconformance as advanced by Corsby (1979), it should always be tailored to meet the needs of the organization. This is important, since the losses caused by ERP implementation failure can be considerable and problems cannot be easily eradicated.

From the project view, COQ is the total cost required to produce a product or service that meets the service quality standards defined for the project. Therefore, the quality costs are the total costs incurred by: investing in the prevention of nonconformance to requirements, appraising a product or service for conformance to requirements, and failing to meet requirements (PMI Standards Committee, 2004). If organizations manage quality costs properly, they will achieve an optimum reduction in quality costs (Ishikawa, 1985).

Most companies categorize financial transactions into revenues, expenses, and changes in shareholder equity in their cost accounting. If they can classify quality-related entries from a company's general ledger, then the management team and quality practitioners can evaluate quality related investments based on cost improvement and profit enhancement. Quality costs are related to either the costs of control (for example prevention costs and appraisal costs) or the costs of a lack of control (for example internal failure costs and external failure costs) (Feigenbaum, 1983). There are four categories of COQ thus discussed.

Prevention costs

The costs of all activities specifically designed to prevent poor quality in products or services, reduce defects and minimize the cost of appraisal and failure. These total costs include quality planning, quality improvement team meetings, quality education and training, process reviews and new product review. The cost of prevention is normally much less than the cost of fixing problems.

Appraisal costs

The costs incurred while performing measuring, evalua-ting, or auditing a product or service to assure confor-mance to quality standards and requirements. These

costs include the cost of design reviews, drawing check on parts, specification reviews, peer reviews, the first time inspection, checking, testing, process or service audits, the calibration of measuring and test equipment, supplier surveillance, receipt inspection, in-process inspection and final inspection. Performing appraisal activities cannot prevent defects from reoccurring; thus, managers know that excessive inspection efforts are costly and ineffective.

Internal failure costs

Failure costs resulting from poor quality of products or services. Failure costs are divided into internal and external failure categories. Internal failure costs are those occurring prior to the delivery of a product, or the furnishing of a service, to the customer. These costs include: Scrap, rework, re-design, re-inspection, re-testing, corrective action, vendor defects, and other similar defects.

External failure costs

External failure costs are those occurring after the delivery or shipment of a product to the customer. These costs include processing the complaints, returns, dissatisfaction and defection of customers, as well as product recalls, compensation and replacement under warranty. They also include the cost of lost customers and markets, repair costs, time spent on corrections, waste time resulting from inefficient activities, liability claims, legal expenses, and so on.

As shown above, the total cost of quality is the sum of four categories of costs:

Prevention costs + appraisal costs + internal failure costs + external failure costs.

Crosby's "price of conformance" includes prevention costs and appraisal costs, whereas the "price of nonconformance" includes internal failure costs and external failure costs (Shank and Govindarajan, 1994; Tsai, 1998). Juran identified quality costs as including tangible factory costs (for example, rework, additional inspection, additional testing), tangible sales costs (for example, warranty costs, customer claims) and intangible costs (for example, loss of customer reputation, loss of sales, loss of market) (Juran et al., 1975). Based on the PAF approach, the activity-based costing (ABC) perspective identifies two categories of cost: value-added (prevention costs) and non-value-added (appraisal cost, internal failure costs and external failure costs) (Ostrenga, 1991; Tsai, 1998). Companies are often reluctant to invest in adequate prevention costs because they rarely have a quantifiable way to evaluate what their failure costs really are. By investing in appropriate systems

systems to prevent defects and appraise quality performance, a company will experience lower overall costs associated with both internal and external failure and, at the same time, improve or maintain customer satisfaction across the board. We list the examples of quality costs associated with ERP implementation in Table 1 and the major activities related to COQ at each phase of ERP implementation in Table 2. The data was collected from interviews and archival sources. In Table 2, we exclude the activities for weekly review, monthly review and quality manager review.

From this table, we find the activities related to COQ in the project preparation and business blueprint phases are prevention activities, and those in the Realization and Final preparation phase are appraisal activities. If the activities require more time than originally planned, then internal failure costs will result. The costs of activities related to COQ in the Go live and support phase are external failure costs. For tangible products, the time point used to distinguish between internal and external failure costs is the time of delivery or shipment of the product to the customer.

Similarly, for the ERP implementation service, the time point used to distinguish between internal and external failure costs is the time of "go live," which is the time when the tested ERP systems are delivered to clients. Defects or failures can increase costs and may cause project delay. The most severe case of failure occurs when company operations stop. To prevent this from happening, project managers need to make every effort to ensure jobs are done right the first time and that no major surprises occur during the project life cycle.

Most quality costs are tangible and can be quantified, but some are quite difficult to quantify. External failure costs are especially difficult to quantify. They include loss of goodwill, legal expense, customer dissatisfaction and defection. Unfortunately, many companies ignore these external failure costs when calculating their cost-benefit tradeoffs. As a result, not only do consultancy companies suffer quality-related costs, but so also does the customer suffer through the loss of data, the cost of recovery, rework and retest, stopped operations, and the cost of technical support.

PROJECT FINANCIAL MANAGEMENT PRACTICE IN BIG CONSULTANCY COMPANIES

Financial management is not just an administration and control function; it is critical to project success. Project financial management is a process which brings together planning, budgeting, financial accounting, financial reporting, internal control and auditing, and the performance of the project. Right project financial management can help companies to manage project resources properly and achieve the objectives of the project. Consultancy companies derive their revenue primarily by performing

Table 1. Examples of quality costs associated with ERP implementation.

Prevention	Appraisal
Requirement analysis	Design review
Blueprint design verification	Code inspection
Early prototyping	Program test
Clear specification	Unit test by module
Accurate and detailed documentation	Integration test across module
Quality planning	User acceptance test
Quality training	Volume stress test
Customization projects development and management	Data conversion test
	Quality audit (perform quality assurance and quality control)
	Process audit
Internal failure	**External failure**
Debug errors	Technical support calls
Bug fixes	Loss of sales
Re-design	Loss of markets
Rewrite document or specification	Loss of goodwill
Direct cost of late delivery	Compensation and replacement under warranty
Re-testing	Legal expense
Rework	Customer dissatisfaction
Repair	Customer defection
Analysis of the root cause of defects	Settling customer complaints
Recovering or re-entering effort for data errors	Failure to get acceptance and billing to customer
Opportunity cost of late delivery	

projects. For these companies, project financial management is very critical for business operations and decisions. The customer relation management process in big consultancy companies includes validating opportunity, managing/qualifying opportunity, designing solutions and creating proposals, initiating projects, executing projects, and closing projects. They manage the financial aspects of the project on an opportunity basis.

The plan cost needs to be requested for each opportunity through a formal approval process. Before submitting the final contract to the customer, there needs to be a formal review and an approval process for bids. The bid packages include a project statement of work, the project financial data such as the plan revenue, plan cost and plan of gross profit, a resources plan, a document of the work with the subcontractor, a project schedule, and a risk assessment and mitigation plan, etc. Big consultancy companies also develop related project financial systems such as a resource demand system, labor claim system, expense re-imbursement system, and project financial information system, etc. For each project, they can obtain the monthly and overall project financial data from the contract start to the end of the contract for the following items: the plan revenue, plan cost and plan of gross profit, and the ledger revenue, ledger cost and ledger of gross profit. The Administration team of the consultancy

company sends the cost data to project managers by the month and provides a warning message to the project managers when the actual cost reaches 80% of the plan cost. Project managers can review their project financial data and take necessary actions immediately.

Resource demand system

If any change occurs, project manages need to update the consultants' plan hours during the project period. The initial version is from the resource plan of the bid package for the project.

Labor claim system

Consultants need to claim their actual activity hours for each opportunity, project, or unrelated activity by Friday of each week. The activity classifications for an opportunity or project code include general billable, travel billable, cost-non-billable, travel-non-billable, etc. Other activities not related to an opportunity or project include vacation, illness, personal business, support, administration, holidays, meeting attendance, internal staff work, training, etc. Consultants are requested to fully claim all actual expenses.

Table 2. Major activities related to COQ at each phase of ERP implementation.

ERP implementation phase	Major activity	Activity related to COQ	PAF classification (activity is planned in the original plan)	PAF classification (redo the activity)
Project preparation phase	Initiate and create project plan			
	Define and set up the project organization			
	Prepare the development environment			
	Prepare and hold project kick-off meeting			
	Prepare quality management plan (quality planning)	Yes	Prevention cost	
	Conduct quality management training to project team	Yes	Prevention cost	
	As-is study			
	Sign off project preparation phase			
Business blueprint phase	Conduct project team weekly meeting	Yes	Appraisal cost	
	Conduct Steering committee monthly meeting	Yes	Appraisal cost	
	Prepare two weeks rolling schedule			
	Conduct requirement deciding meeting			
	Requirement analysis	Yes	Prevention cost	Internal failure cost
	Prepare Business blueprint report			
	Prepare gap analysis report			
	Data mapping between old system and new system			
	Blueprint design verification and confirmation	Yes	Prevention cost	Internal failure cost
	Conduct quality review	Yes	Appraisal cost	
	Sign off Business blueprint phase			
Realization phase	Conduct project team weekly meeting	Yes	Appraisal cost	
	Conduct Steering committee monthly meeting	Yes	Appraisal cost	
	Prepare and set up testing environment	Yes	Appraisal cost	
	Configure system			
	Develop customized programs			
	Execute data cleansing plan			
	Prepare and conduct unit test	Yes	Appraisal cost	Internal failure cost
	Prepare and conduct integration test	Yes	Appraisal cost	Internal failure cost
	Prepare key user training material			
	Conduct key user training			
	Test data conversion programs	Yes	Appraisal cost	Internal failure cost
	Prepare and perform 1st data conversion test	Yes	Appraisal cost	Internal failure cost
	Prepare and perform 2nd data conversion test	Yes	Appraisal cost	Internal failure cost
	Set up printer			

Table 2. Contd.

	Test printer	Yes	Appraisal cost	Internal failure cost
	Conduct user acceptance test	Yes	Appraisal cost	Internal failure cost
	Conduct volume stress test	Yes	Appraisal cost	Internal failure cost
	Prepare cut-over plan			
	Review and confirm cut-over plan	Yes	Appraisal cost	
	Perform quality check	Yes	Appraisal cost	
	Sign off realization phase			
Final preparation phase	Conduct project team weekly meeting	Yes	Appraisal cost	
	Conduct Steering committee monthly meeting	Yes	Appraisal cost	
	Conduct end user training			
	Prepare and set up background job			
	Set up user environment			
	Test user environment	Yes	Appraisal cost	Internal failure cost
	Execute cut over plan			
	Set up background job			
Go live and support phase	Provide go-live support			
	Manage and resolve issues and problems	Yes	External Failure cost	External failure cost
	Project closure			

*Note: PAF – Prevention, appraisal, failure.

Expense reimbursement system

Consultants need to submit their travel and miscellaneous business expenses on time. The expense items include mileage, business meals, car rental, education-related costs, hotels, taxis, telecom/mobile usage, tolls, visa expenses, agency transaction fees, air travel, etc. The expenses must be charged using the department, opportunity or project code.

Project financial information system

This system can provide overall project information to project managers such as consultants' plan hours and actual hours, labor costs, travel and miscellaneous expenses, sub-contractors' costs, plan revenues, plan costs and the plan of gross profit, as well as ledger revenue, ledger cost and the ledger of gross profit, etc.

The systems are ready; however, the systems rely on related persons to enter the actual and complete data, and to do this on time.

Timely and precise financial data are crucial to effective decision-making and appropriate corrective action by project managers, since they enhance the prospects of timely completion within the planned project budget and scope of deliverables. It is also be necessary for the management team to take certain actions, such as arrange for the assignment of consultants.

The financial transactions in the cost accounting system of consultancy companies can be categorized into revenues, expenses and changes in shareholder equity. Quality costs are not categorized. If a company can classify quality-related entries in their system, it can help the management team and practitioners to evaluate investment in quality based on cost improvement and profit enhancement.

PROJECT QUALITY MANAGEMENT PRACTICE IN BIG CONSULTANCY COMPANIES

Projects are temporary and unique. The purpose of a project is to attain its objective and then

terminate (PMI Standards Committee, 2004). According to the project scope and schedule, the project team is set up based on the availability and skills of consultants. To make sure that different project teams can deliver the standard level of quality service, consultancy companies rely on standard procedures such as an implementation methodology, project management plan, quality management plan, communication plan, procurement procedure, and project change request procedure. They also produce the templates of project documents. These documents include an issue log, project financial worksheet, project change request form and project plan, etc. Consultancy companies make every effort to introduce quality planning into the organization, and to motivate practitioners to strive toward continuous quality improvement.

Most project managers are very focused on managing the "triple constraint." However, only a few project managers know the importance of project quality management and how to apply it in their daily life. Quality management is the process of ensuring that all project activities are effective and efficient, and that there is no last minute surprise in the project deliverable. The project quality management processes include quality planning, quality assurance and quality control.

Quality planning

As stated previously, quality is the degree to which customer's requirements and expectations are fulfilled. Since project managers have to balance quality, scope, time, and cost, quality planning needs to take into account cost-benefit tradeoffs (PMI Standards Committee, 2004). For cost control, the most important decisions regarding the quality of the project need to be made at the beginning of the project. Project managers have to come out with a project quality management plan that includes identifying the service quality standards of the project and determining how to satisfy them. Thus, the quality management plan is part of the project management plan. Service quality standards include the naming rule and basic content of each document pertaining to the project deliverable, the naming rule and coding rule of the program, the mechanism of data conversion, the testing procedure, etc. Project managers also have to provide quality management training to the project team and ensure team members agree and comply with the project quality management plan.

Perform quality assurance

Quality assurance is the systematic monitoring and evaluation of the various aspects of a project to ensure the minimum quality standards are being attained and that things are done right the first time. The project management process is designed to ensure that quality is built in at each phase of the project.

This is the best way to ensure the results meet the agreed quality standards. Conducting a quality review on each project deliverable at the end of each phase of the project is the other ingredient in building quality into the project outputs. The quality assurance department often handles quality assurance activities in big consultancy companies. Depending on the project's size, complexity and issues, most projects will be reviewed periodically with the quality assurance staff. An added benefit of quality assurance is that it provides continuous process improvement, which can reduce non-value-added activities and ensure the processes operate at an increasing level of efficiency and effectiveness.

Perform quality control

Quality control encompasses a group of activities designed to ensure the quality standards of the project have been attained. A major project failure can totally destroy a business. Thus, quality control should be performed throughout the project to identify ways of eliminating the causes of unsatisfactory results. Successful project managers have to regularly review the project's progress against the scope, schedule, budget and quality elements of the project. They need to identify problems or issues and risks early, so that corrective actions can be taken to keep the project on track, minimize negative impacts to the project and mitigate the project risks.

Conclusions

"Triple constraint" of project management is project scope, time and cost. If any one of the three factors changes, at least one other factor will be affected. In particular, quality will be affected. Project managers have to balance the competing requirements of quality, scope, time and budget to meet their project management goals. To achieve quality, project managers need to complete customers' stated and implied needs within scope, on time, and within budget. If we cannot define the quality standards of a project then we cannot manage and measure it. As with project cost control, project managers should determine an acceptable level of service quality that is needed to optimize customer satisfaction and service efficiency. They also need to ensure the project team is adequately informed and working from the same page. The COQ can help a company to focus on improving their business performance and reduce wasted resources and the departure of best talents. The costs of customer dissatisfaction, product performance, and rework negatively affect project budgets, schedules, and overall enterprise revenue. It is very important to establish good quality control for projects to improve process enhancements and overall project effectiveness and efficiency.

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APPENDIX

Table 1. Major activities at each ERP implementation phase.

ERP implementation phase	Major activity
Project preparation phase	Initiate and create project plan
	Define and set up the project organization
	Prepare the development environment
	Prepare and hold project kick-off meeting
	Prepare quality management plan (quality planning)
	Conduct quality management training to project team
	As-is study
	Sign off Project preparation phase
Business blueprint phase	Conduct project team weekly meeting
	Conduct steering committee monthly meeting
	Prepare two weeks rolling schedule
	Conduct requirement deciding meeting
	Requirement analysis
	Prepare business blueprint report
	Prepare gap analysis report
	Data mapping between old system and new system
	Review and confirm the Business blueprint and gap
	Conduct quality review
	Sign off Business blueprint phase
Realization phase	Conduct project team meeting by weekly
	Conduct Steering committee meeting by monthly
	Prepare and set up testing environment
	Configure system
	Develop customized programs
	Execute data cleansing plan
	Prepare and conduct unit test
	Prepare and conduct integration test
	Prepare key user training material
	Conduct key user training
	Test data conversion programs
	Prepare and perform 1st data conversion test
	Prepare and perform 2nd data conversion test
	Set up printer
	Test printer
	Conduct user acceptance test
	Conduct volume stress test
	Prepare cut-over plan
	Review and confirm cut-over plan
	Perform quality check
	Sign off Realization phase
Final preparation phase	Conduct project team meeting by weekly
	Conduct Steering committee meeting by monthly
	Conduct end user training
	Prepare and set up background job
	Set up user environment
	Test user environment
	Execute cut over plan

Table 1. Contd.

	Set up background job
Go live and support phase	Provide go-live support
	Manage and resolve issues and problems
	Project closure