



## **Why IT Projects fail - an Omani Experience**

### **Summary of the Paper**

This paper analyses the reasons for failure of IT projects based on the experience in audit of public sector undertakings by State Audit Institution, Sultanate of Oman. The results of audit indicated that while outright failure of IT Projects was rare, failure to achieve all objectives of the IT Project within the envisaged time and cost and underperformance had been more frequent. The paper also outlines the risks unique to 'brownfield migration IT projects'.

In the context of globalization and liberalization, a new risk faced by IT projects emanates from change of ownership of enterprises. Since IT strategy has to be dovetailed to the business strategy and since the business strategy may change with change of ownership, the IT projects are also exposed to risk of termination or shorter life span. SAI Oman observed that in one such case, the data security concerns of the new owner resulted in abandonment of an IT project. In another case, the need to conform to the requirements of the IT system of the new parent company led to development of a new system. Freezing of the new projects till clarity on business/IT strategy of new owner is received is a limited method of minimizing the risk.

The fast pace of technological advancement in IT field dictates quick response by management in decisions affecting the project. Delay in one such case led to the project becoming obsolete by the time it was rolled out. Fast track decision making and execution may lead to longer life spans for IT systems.

The global shortage and resultant high turnover of IT professionals have negatively influenced IT project schedules. Proper documentation and penalty/incentive clauses in the contract with the vendor can limit the damage from this risk to a reasonable degree.

The 'brownfield migration projects' which are more common in the Sultanate face unique risks arising from inadequate gap analysis and from deficiencies in migration of data from legacy system to new systems. In one such case, the failure to properly assess the



state of readiness of existing technology to embrace a new billing system led to its abandonment pointing to the need for rigorous gap analysis studies before deciding on a project.

Data migration to the new system can be streamlined through the medium of a data clean up application to which the data from the legacy system are initially transferred through interfaces. Data editing can then be carried out by in-house experts before green signal for its acceptance is given. A systematic and target driven plan, forming part the anchoring phase of a project to implement SAP in an oil & gas major, in the Sultanate paid rich dividends underscoring the need for proper data migration plans.



## **1.0 Introduction**

IT projects like all other projects are prone to risk of failure. The inherent risks of IT projects include both underperformance of the project and abandonment of the project. The project failure may arise from a number of factors ranging from poor project conception to inefficient project management. This paper analyses the reasons for failure of IT Projects, observed during audits of public sector undertakings of the Sultanate, by State Audit Institution (SAI), Sultanate of Oman. The results of audit indicated that outright failure of IT Projects was rare but failure to achieve all objectives of the IT Project within the envisaged time and cost had been more frequent. The conclusions drawn are therefore primarily based on instances of underperformance of IT Projects noticed in audit. SAI Oman also observed certain unique risks of failure which 'Brownfield Migration IT Projects' were subject to. The identity of the auditee is being withheld in the paper in view of confidentiality requirements under the State Audit Law governing the functioning of the State Audit Institution. The reasons of failure are discussed below:

## **2.0 Risks to the IT project from change of ownership of enterprise**

The IT strategy of an organization has to be synchronized with its Business strategy for its success. No IT strategy/project can succeed unless business imperatives exist for its use and such strategy/project dovetails with the business strategy. Business strategies are dynamic and are influenced by changes in both the external and internal environment of the enterprise. A change in ownership of the enterprise does therefore result in a review of the existing business strategy. This in turn will have implications on the existing IT strategy of the enterprise as well as the IT applications in use or under development. Privatization of government owned entities and acquisitions of business having increased as a result of globalization and liberalization process, occasions to revise the IT strategy are on the increase. Enterprises have now got to factor in the risk of impending and potential takeovers on the IT strategy while deciding on investment in new IT projects.

SAI Oman has observed that the success and lifespan of IT projects are affected by the change in ownership of the enterprise. A financial software application under



development in an oil exploration company had to be abandoned when the pattern of ownership of the company was changed with the entry of a new shareholder with significant stakes in the equity. The new entrant was averse to continuing with the application under development without significant modifications on account of possible data security concerns. The abandoned of the project after securing necessary licenses for supporting software, resulted not only in loss of returns from the project but also in continuation of inefficiencies of the existing system particularly with regard to the authorization of payments.

Takeovers of business enterprises have also resulted in the need to fine tune an existing application with that of the new entrant. In one such case involving a company managing a port, the lifespan of the existing application had to be reduced since a new system conforming to the requirements of the IT application in use at the parent company had to be developed. The takeover of the parent company abroad by a new owner resulted in the need for integrating the IT systems of the subsidiaries with that of the new owner for operational reasons. In the process the existing application had to be terminated.

While predicting change of ownership is not always possible in a business environment, it may be prudent policy to freeze all further activities on an IT project yet to commence at least until clarity on the new ownership and their views on business and IT strategies are made clear.

### **3.0 Risk to IT projects from inefficient management practices**

Commitment of top management is critical for the success of any IT project. The commitment of top management translates to enterprise-wide consensus and commitment affecting the speed and quality of execution of an IT project. With the IT technology undergoing rapid changes, the need for timely execution of IT projects can never be overemphasized.

SAI observed during the course of audit of an IT project with the objective of introducing a new form of broadband communication technology, that delayed responses by the management in decision making coupled with lack of coordination between various departments responsible for implementing the project, resulted in the technology



becoming obsolete by the time it was rolled out. The project was eventually cannibalized by a new one based on superior technology soon after it was launched after inordinate delay.

The learning point from the failed project is that proper survey of technological alternatives is imperative in taking capital expenditure decisions in IT sector. Since the pace of change in IT industry is extremely high, the risk of technology becoming obsolete is also correspondingly high. Selection of technology with proper level of maturity is therefore of paramount importance to avoid short lifespan for IT Projects.

#### **4.0 Risk of turnover of key IT professionals**

Continuity of key personnel of the vendor earmarked for the project is of paramount importance for the timely completion of the project. Change of personnel midway through the project apart from adversely affecting the project schedule also results in increased demands on the staff of the organization entrusted with task of familiarizing the vendor's personnel with the project requirements.

SAI has observed that the issue of high turnover of personnel affecting the IT industry in the Indian subcontinent has negatively influenced the project schedule in some of the projects under implementation in the Sultanate. The growth of Indian IT companies has created a demand supply gap in the IT industry. With the IT sector in the Sultanate, like several other countries of the world, engaging a large number of IT professionals from India directly and indirectly, IT projects in the Sultanate are also exposed to the risk of turnover of key professionals.

Theoretically, proper documentation can reduce the impact of the change of personnel. However in practice, it is observed that the change adversely affects the learning curve of the vendor/developer of the software application or the consultant. The practice of identifying key personnel and levy of penalties for failure to man them throughout the required period of the project, normally included in all construction project contracts in the Sultanate may reduce the impact to an acceptable level.



## **5.0 Unique risks of IT Migration Projects:**

A dominant characteristic of IT projects initiated in the new millennium in the Sultanate is that most such projects are upgradation projects for migration from the existing system to a more advanced system. This trend is driven by the incessant development of new technologies in the IT sector and the fact that migration from manual systems to computerized systems had already taken place in the previous decade. Not surprisingly therefore, majority of the underperformance noticed in audit by SAI, related primarily to issues of migration from one system to another. The experience of SAI shows that ‘Brownfield Migration Projects’ while sharing the general risks of any IT project, have peculiar set of risks different from those faced by ‘Greenfield IT projects’. Some of these risks are the following:

### **5.1 Risks from ‘gaps’ in gap analysis**

Migration projects necessarily involve proper ‘gap identification studies’ and generation of ‘gap resolution alternatives’. The gap analysis should identify the changes required to migrate from ‘as is’ state of the existing software and hardware architecture to the ‘to be’ state of the proposed architecture. Inadequate appreciation of the system leads to design issues which are a sure recipe for project failure. Interdependencies and integration issues require to be identified clearly in the migration project study.

SAI has in its audit of a provider of services in the telecommunications sector noticed a case of failure of an IT project attributed to late appreciation of the state of readiness of the existing technology to absorb the proposed technology. The service provider decided to develop a new convergent billing solution for its mobile and fixed line network in place of the existing stand-alone applications. Considering the enormous efforts and resource requirements, a phased approach was adopted in implementing the convergent system with priority for the fixed line network. The licenses required for implementation of billing solutions for both fixed line and mobile services were provided by the vendor. It was subsequently observed in the gap analysis carried out that the fixed line network was not mature for automated service provisioning and for moving from the existing switch-based reading to billing-based reading. The fixed line portion of the project had to



be subsequently cancelled to be taken up after upgradation of the fixed line infrastructure. The midcourse decision to accord priority to mobile service over the originally planned fixed line network apparently also strained the existing mobile hardware at the time of testing and development resulting in mission critical defects at the time of 'go live operations'. The organization was compelled to shift back and forth between the two systems at considerable embarrassment and inconvenience to customers.

Gap analysis has therefore got to be carried out early in project life and subjected to a rigorous process of challenging to ensure that the project is successful on launching. Failure in this segment can also lead to de-scoping of services and/or disruption of services as noted in the case discussed. The resultant embarrassment and loss of business reputation are adequate threats to ensure quality in the gap analysis carried out.

## **5.2 Risks from strategy for migration of data from legacy systems to new system**

A critical activity affecting the success of migration project noticed by SAI is the process of populating the new system with vital data from the existing system. Deficiencies in migration of either master data or transaction data to the new system directly affect the utility of the new system and results in its underperformance. The timely completion of the project is often seen to be heavily dependent on promptness and quality of data migration. Migration of data is therefore an important risk factor affecting the success of an IT project.

SAI Oman has observed that one of the major reasons for time over run of IT projects in the Sultanate is delay experienced at this stage of the project. The delay oftentimes arises from shortages in manpower deployed for data capture and/or integrity of the existing data. The existing data having been collected on the basis of a framework that existed prior to the new project, they are often insufficient for operation of the enhanced system in the new framework. This makes data population activity a 'mission critical activity' needing monitoring by the top management.

Traditionally, organizations have been populating data in the new system both manually and by the medium of software programs. In case of transfer through the medium of software applications, problems arising from mismatches of data have been observed in



isolated cases. A practical and successful solution ensuring quick and complete migration of data is developing a simple software program with appropriate screens for capturing data and training the concerned personnel in the use of it. This method is recommended when the quality of data is not of good order necessitating subjective judgment before its acceptance in the new system. It is also recommended when the size of data to be captured is huge requiring engagement of large team to capture it. The existing data, with basic modifications as can be easily done, can first be migrated to the new 'data clean-up' application where it can be reviewed by the trained users through the more user friendly data interface (primarily data editing/viewing screens). This becomes important as most users who have knowledge about the attributes of data which determine its quality and adequacy for the new system, may not be able to appreciate data correctness when seen at the SQL layer. If the application additionally has the facility of capturing new transactions from a cut off date in the new format required, it will also facilitate quick transfer of data at the time of migration. Adoption of this method in a new asset management software by a government agency in the Sultanate upon advice by SAI, resulted in timely capturing of clean data, wherein even while the financial application was under development, transaction data continued to be updated in the data capture/cleanup application for final migration to the new system.

SAI has also observed that improper management of data migration can not only result in project failure but also lead to permanent loss of data. Proper migration procedure alone can provide insurance against data loss. SAI has observed an instance of permanent loss of data in a project involving change of servers. A detailed migration plan had not been drawn up and steps taken to save the data before changing the servers. This resulted in the loss of data.

Some of the pitfalls in data migration related to absence of data validation. In one such instance of an IT project for inventory management, different codes were assigned to the same inventory item by different personnel engaged to capture data on project materials. The accuracy of the inventory value generated by the new system suffered as a result of the mismatch.



### **5.3 Measures to overcome challenges in data migration**

Since most IT Applications operate on databases, the initial and continued success of IT projects is dependent on data integrity. This becomes even more critical in cases of ‘brownfield’ projects where seamless migration in providing of IT service through the application is also one of the desired goals. Errors in data migration also lead to an incorrect assessment of the quality of the new application, making testing and validating the application all the more difficult. Treating data migration as an independent project by itself, with greater role being played by the organization (and not the vendor) can go a long way in addressing this oft-neglected issue. A dedicated team, with good knowledge of the existing business and understanding of what constitutes data quality from the point of view of new system, can be entrusted with managing the data migration project. The vendor may assist this team in migrating the data to an intermediate system, where quality can be assessed and changes made to ensure conformity with the new system. SAI has observed that systematic and target driven planning by the project team can alleviate the problems arising from defective data capture. A leading company in the oil & gas exploration, development and operations sector overcame this challenge in implementation of SAP through meticulous planning. The project team had identified that achievement of key performance indicators in respect of seven activities under three different focus areas of SAP was below acceptable level. Unprocessed transactions were seen to be causing problems throughout the system. Data clean up operations were therefore one of the main agenda of the ‘anchoring process’ undertaken by the project team after the system stabilization phase that followed immediately after ‘going live’. Specific milestones were fixed for ‘data clean up’ operations in the anchoring phase. Six different initiatives were launched as part of the anchoring process to clean up data and to ensure documentation of key equipments. Quality Assessment Reviews at key points in project plan along with ‘problem ticket resolution reviews’ helped in time bound achievement of targets. ‘Impact Assessment Workshops’ with participation by project stakeholders also helped in promoting team effort. One of the significant impacts of the data cleaning program was ‘task list rationalization with removal of 54% duplicate tasks and asset records revision with 50,000 missing assets being added. An intensive training



program led to improved commitment from asset and service provider teams to register and update all activities in SAP thereby enabling integrated operation of SAP. The process helped in achievement of the main objectives of SAP covering work management, supply chain management and finance management.

## **6.0 Conclusions**

The influence of ownership changes in the enterprise, fast pace of technological advancements in IT field and the global shortage and high turnover of IT professionals are risks which have to be assessed and minimized to ensure success of IT projects. There is also a strong need for meticulous planning and monitoring the data migration process from legacy systems in respect of brownfield migration projects in order to ensure success of such projects.