

A Methodology for Managing Large-Scale IT Projects

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ABSTRACT

This paper presents a project management methodology - developed part of an engineering doctorate research at Warwick University - for managing large scale IT projects with a focus on national ID programmes. The methodology was mainly tested in the United Arab Emirates (UAE) and was followed in three GCC countries. The research demonstrated that by following a formal structured methodology, governments will have better visibility and control over such programmes. The implementation revealed that the phases and processes of the proposed methodology supported the overall management, planning, control over the project activities, promoted effective communication, improved scope and risk management, and ensured quality deliverables.

INTRODUCTION

Many governments around the world have started realising the benefits of integrated technologies such as smart cards, biometrics, and public key infrastructure in improving the total security of their national identity systems. Among the very ambitious programmes - incorporating these technologies - many governments have initiated are the *national ID* schemes. Despite the strong criticism of opposition groups, governments seem to be convinced about the potential benefits such programmes would bring. One of the strong arguments many governments advocate is that a modern national ID system is essential at an era where identity theft is growing with horrific impact not only on governments, but also on businesses and citizens. In a recent study conducted by the Privacy Clearing House, the total value of identity theft crimes – in US only - reached US\$56.5 billion in 2006 (see also Figure 1).

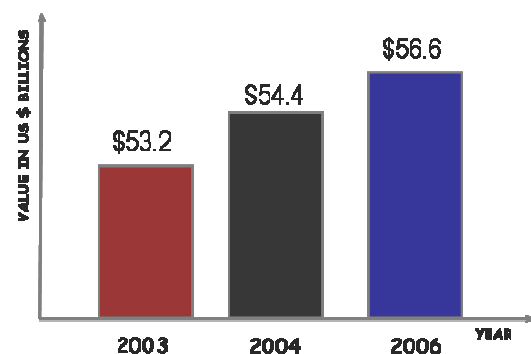


Fig. 1: Cost of ID theft in USA

Figure 2 shows a force-field analysis that provides an overview of the driving forces as well as the restraining forces of such initiatives.

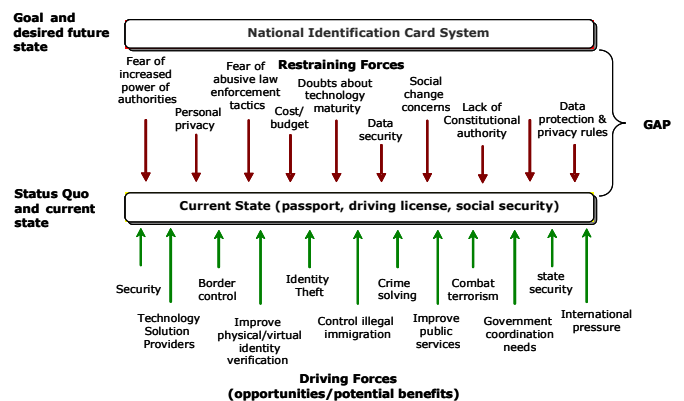


Fig. 2: National ID projects force field analysis

As one of the restraining forces depicted in Figure 2, recent studies estimated the cost of implementing this type of large IT projects to scale up to multi-billion US dollars (Fontana, 2003). The nature, size and complexity of these projects raise the failure probabilities of these projects. This is in reference to the accepted phenomenon in the literature by both academics and practitioners that information technology projects have very high failure chances and that between 60 to 70 per

cent do actually fail. Many other researchers argue that the actual figure might be far more frightening since many organisations tend not to disclose such experiences, due to fear of criticism by audit or the media (Dorsey, 2004; Fichter, 2003).

By and large, the knowledge required to succeed with IT is complex and rapidly changing. It is noted that the examples in the existing literature are rarely of the size and complexity of national ID projects. Proceeding without understanding and managing the risk inherent in such projects will obviously lead to higher probabilities of failure.

This paper presents a project management methodology that was implemented in the UAE national ID programme to support the management and control of the project phases.

This paper is structured as follows. First some recent studies on the IT projects failure are highlighted along with the factors leading to such results. Then the field of project management is briefly explored to pinpoint the need for a methodological approach to managing large IT projects in general, and national ID projects more specifically. The process followed, underlying principles, and an overview of the proposed methodology phases are provided next. A synopsis on the implementation of the methodology and its value are outlined in the following two sections, and the paper is then concluded.

IT PROJECTS FAILURE

In line with the above statistics, it is estimated that between 20-to-30% of industrialised country government IT projects fall into the total failure category; 30-to-60% fall into the partial failure category; and that only a minority fall into the success category (Heeks, 2003). Studies indicate that large-scale projects fail three to five times more often than small ones (Charette, 1995). Such failure can impede economic growth and quality of life and that the cost of failure may become catastrophically excessive as societies come to rely on IT systems that are ever larger, more integrated, and more expensive (ibid). Many researchers pointed out that a lot of today's failures are avoidable and that many of the projects fail because of foreseeable circumstances and that organisations need to give careful attention to several factors to avoid failure (Avison & Wood-Harper, 1990; Bentley, 2002; Berkun, 2005; Broder, 1999; Curtis, 1998; Lam, 2003; Radosevich, 1999).

Among the widely quoted factors contributing to failure is that organisations tend to treat IT projects from pure technological perspectives, and not give much attention to other organisational and management issues. The literature shows that technology can contribute as little as 15 percent to the overall success of projects, where as the remaining 85 percent is dependent on bigger organisational issues related to people, data, and management (see also Figure 3).

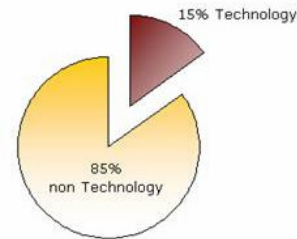


Fig. 3: Critical Success Factors - Technology Vs. Non-Technology

Research points to the fact that one of the principle causes of information system failure is when the designed system fails to capture the business requirements or improve the organisational performance. Figure 4 below illustrates an example of how a user's requirements might be interpreted, not only at the requirements analysis stage but throughout the project.

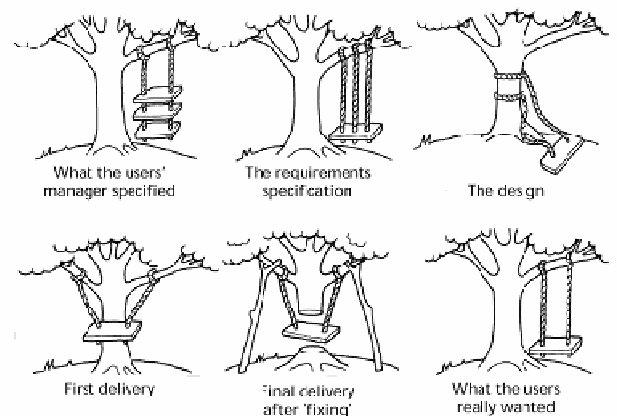


Fig. 4: interpretation of user requirements

PROJECT MANAGEMENT

The argument of this research undertaking has been mainly to advocate that by following a disciplined methodology that sets standards for all phases of the project is more likely to increase the success chances. Project management is viewed as the art of defining the overall management and control processes for the project (Devaux, 1999; Garton and McCulloch, 2005; Stankard, 2002). Project management worked with differing degrees of success, in different industries, different organisations, and on different projects. What is undeniable is that industries have been much more successful when project management is used than when it was ignored (Devaux, 1999; Ireland, 1991). A project management methodology that takes into account the success and failure factors in the field of IT projects are more likely to increase the success probabilities of the

project (see for example: Avison & Fitzgerald, 1998; Curtis, 1998; Flynn, 1998).

Looking at the existing available methodologies, the literature perceives the field as a jungle with large and confusing variety of approaches in existence (Avison & Fitzgerald, 1998). It is estimated that over a thousand brand name methodologies exist world-wide (Jayaranta, 1994). Charvat (2003) found in an analysis of 18 different methodologies that:

- (1) some focus purely on the technology itself,
- (2) others focus more on a generic project management approach

As such researchers argue that organisations need to carefully assess the methodology based on the organisational requirements and that it is the project size and complexity which necessitates the use of the *fitting* methodology (Berkun, 2005; Charvat, 2003; Radosevich, 1999; Verrijn-Stuart, 1991; Gilbreath, 1986).

From a practical point of view, there is no one methodology that guarantees success, but rather by employing one, an organisation will have a structured set of concepts to handle each step - from understanding the business requirements to the development of the system - in the project (Avison & Fitzgerald, 1998; Crain, 1992; Curtis, 1998; Harry, 1997; Ives & Olson, 1985; Newman & Sabherwal, 1996; Olle et al., 1991)

The following section describes the process followed in the development of the methodology that was later implemented to manage the UAE programme.

CRAFTING THE METHODOLOGY

Researchers have continuously emphasised the need for organisations to seriously analyse failed or out-of-control IT projects, and the associated challenges. Nonetheless, research to date has found no single explanation for system success or failure. Nor does it suggest a single or a magic formula for success. However, it has found different elements leading to project success or failure. These elements were more or less presented in the Standish Group *CHAOS 2001* report as shown in Table 1.

Successful projects	<ul style="list-style-type: none"> • User Involvement • Executive Management Support • Clear Statement of Requirements • Proper Planning • Realistic Expectations
Challenged projects	<ul style="list-style-type: none"> • Lack of User Input • Incomplete Requirements & Specifications • Changing Requirements & Specifications • Lack of Executive Support • Technical Incompetence
Failed projects	<ul style="list-style-type: none"> • Incomplete Requirements • Lack of user involvement • Lack of Resources • Unrealistic Expectations • Lack of Executive Support • Changing Requirements & Specifications • Lack of Planning • Didn't Need it Any Longer • Lack of IT management • Technical Illiteracy

Table 1: indicators found between and successful and failed projects

Mapping these factors from Standish report to the literature, the most common factors that contributed to project success or failure were:

- Management Commitment
- Business Strategy Focus
- Requirements Definition
- Complexity Management
- Changing targets
- Formal Methodology
- Project Management
- Planning
- User Involvement
- Risk Management

These factors were taken into consideration when designing the methodology. In the development and implementation of the methodology, the underlying principles were based on theories and practices coming from two subject areas: (1) Project management, and (2) System development. In addition to the above elements, the methodology has been developed to address the core needs identified for supporting and improving the following:

1. concept development
2. overall project portfolio management
3. management of stakeholders expectation
4. analysis of requirements
5. quality of output
6. utilisation of resources
7. communication and management reporting
8. project control and risk management
9. knowledge management

A two-staged project management methodology consisting of nine phases was developed depicted in Figures 5 and 6. The methodology is composed of the following interlinked processes:

1. initiating processes
2. planning processes
3. executing processes
4. controlling processes
5. closing processes

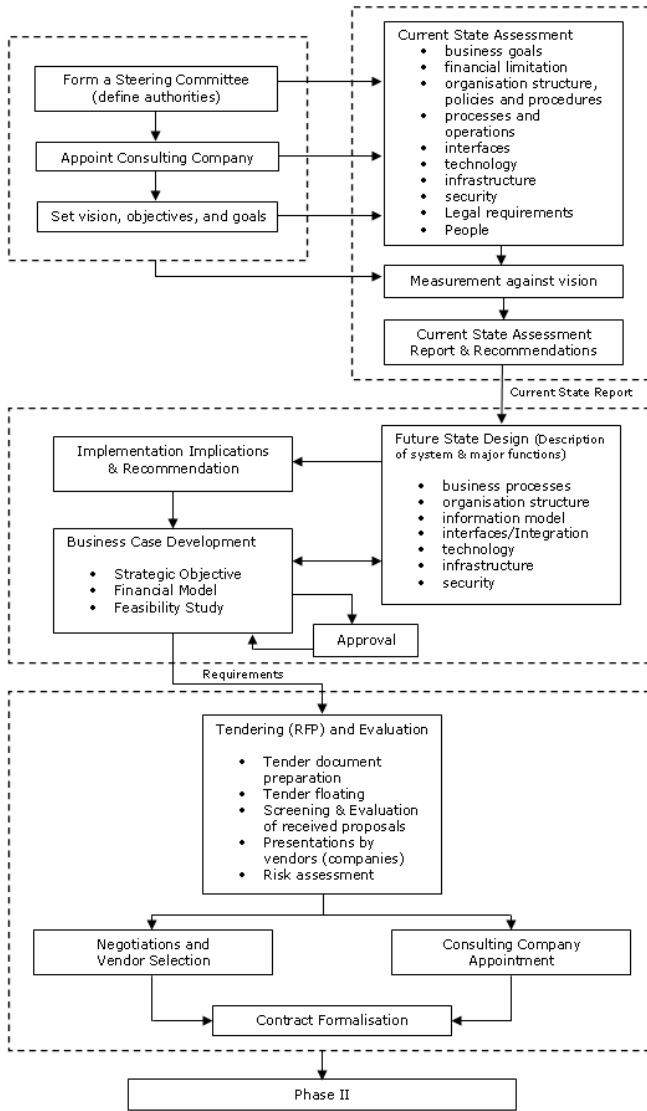


Figure 5: Phase one of the proposed methodology

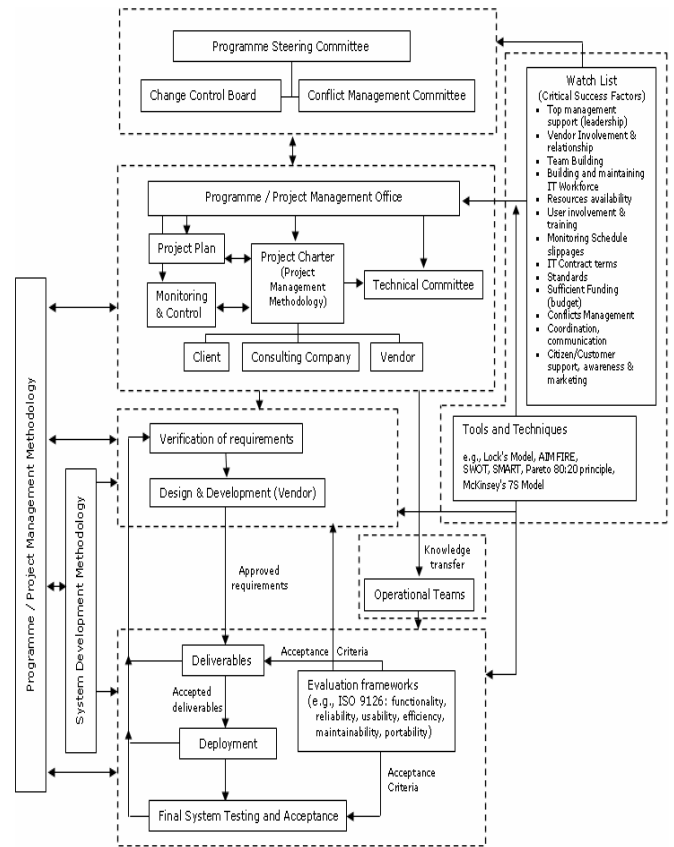


Figure 6: Phase one of the proposed methodology

APPLYING THE METHDOLOGY

The methodology was mainly tested in the UAE national ID project. It was also partially tested¹ in other large scale projects in three national ID initiatives in the region. Presentations in conferences and official delegation visits to many countries worldwide contributed to the overall enhancement and supported the value of the methodology. The model was refined at several stages to address common problems identified during the implementation in the UAE, and the feedback from the government officials and experts in the field.

The implementation of the methodology in the UAE project has revealed the following contributions to the overall project management which was supported by the GCC technical committee:

1. agreed and articulated project goals and objectives
2. staged and controlled phases with sign-offs
3. regular reviews of progress against plan, scope, quality.

¹ The methodology was communicated and discussed with the officials in the form of (training) workshops primarily in the technical GCC committee meetings where the researcher was a member of. The committee was formed to set the standards for national ID programmes and involved key members from the programme management teams from the six GCC countries.

4. supports project and management status reporting
5. global overview of the project processes, beginning and end of the project, and all the work in the middle
6. strong management control through clear change control and conflict management procedures
7. promoted the involvement of management and stakeholders at different stages of the project
8. clear focus on defining system requirements
9. capturing and sharing of lessons learned
10. improved project control – evaluate and measure performance based on the defined scope, schedule, budget, quality of deliverables.
11. transparent project management practices
12. risk management
13. handled project complexity
14. virtuous communication channels among the project stakeholders

Twelve consideration areas that governments need to heed during the course of the scheme implementation were also identified:

- Having clear goals
- Appointing a project director
- Setting up a project management office
- Assessing project managers skills (leadership skills, communication, negotiation, delegation, problems solving, change management, etc)
- Develop stakeholders commitment
- Dealing with project team anxiety
- Team assembly
- responsibility assignment (RA) through RA Matrix
- Monitoring, evaluation and control
- Performance observation
- Planning and communicating
- Skilled team members
- Flexibility of the project plan

SIGNIFICANCE AND VALUE OF THE METHODOLOGY

The implementation results of the UAE system, and the feedback from GCC countries, government officials and experts in the field indicated the value and significance of the methodology. The methodology was noted to incorporate flexible and easy to understand principles of project management to improve the planning and control of national ID schemes. There was also a common view that the phases and processes of the methodology improved the overall visibility and control of the project activities, promoted effective communication, supported scope and risk management, and ensured quality deliverables.

One could still argue that multiple data from multiple case studies would have provided better indication of the reliability and value of the development methodology. However, governments' policies especially in this kind of projects do not allow close involvement or data dissemination. In fact, government projects are tend to be hidden from the public domain in many countries. The nature of national ID programmes carries much higher confidentiality rating. Nonetheless, to prove real usefulness and contribution as a standard for managing national ID projects, it would require a significant period of time to gather objective quantitative data from different experiments. Nevertheless, the methodology takes an advantage over the existing standard methodologies in the fact that it has been applied and customised to a live project in the UAE. The appreciation and feedback from the GCC countries, government officials worldwide, and experts in the field demonstrates the usefulness of the methodology too.

CONCLUSION

Following best practices or a particular project management methodology or framework, cannot make projects *failure proof*. To succeed, a successful project needs much more than a cookbook approach specially when implementing large scale projects. There are many issues that require management attention and a comprehension of their possible impact is considered essential to increase the chances of a successful endeavour.

This research attempted to add value to the limited knowledge currently available to practitioners and researchers about managing national ID programmes. The study recognises the value of formal project management and introduces a tested methodology to more effective management of such initiatives. Project management was found crucial to exist in such large scale and complex projects where attention was required to analyse and carefully respond to the implications of the slightest change.

Management must realise that every project is unique, and that by repeating old experience or practices from similar past projects will not help to accommodate the ever changing landscape of today's projects. Successful implementation requires clear business process, the ability to manage the system's flexibility, and the ability to cope with high complexity levels (Frame, 1999; Garton & McCulouch, 2005; Gilbreath, 1986). Above and beyond, successful implementation requires superior skill in a variety of generic business, communication, and organisational skills, in addition to knowledge of the deployed technologies (Haller, 1998; Ireland, 1991; Kerzner, 2004; Page, 2002). Under these circumstances, project management is argued to be essential to achieve better visibility and control over projects.

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