

# Project portfolio management implementation pitfalls

A. Leonard\* and A. Swanepoel

Department of Informatics, University of Pretoria,  
Pretoria 0002, Republic of South Africa  
Awie.Leonard@up.ac.za

*Received October 2009*

Project portfolio management could be regarded as one of the most comprehensive ways of managing a software project environment. To implement such a management approach in a large organisation, could also be seen as an endeavour that can only have a chance of success if all role players understand the pitfalls involved and how to deal with each. In this paper, a structured approach is proposed to identifying and addressing pitfalls that may potentially hinder the successful implementation of project portfolio management as a strategic initiative in an organisation. Furthermore, the paper presents an approach to combine checklists and pitfall management theories to identify those pitfalls that may realise during the implementation of project portfolio management.

\*To whom all correspondence should be addressed.

## Introduction

Project portfolio management (PPM) evolved from project management (PM) as a multi-program discipline that provides a synergy that cannot be acquired by managing the same projects separately (Levine, 2005:23; Project Management Institute, 2006:4; Maizlish & Handler, 2005:112–121).

Implementing of a PPM within an organisation or for a specific portfolio is best done through a fully fledged project where PM principles are applied and monitoring and controls are in place to verify that objectives are achieved (Levine, 2005: 81–84).

Project success is directly influenced by the management level of pitfalls conducted by the project team (Zhou, Vasconcelos & Nunes, 2008:166; Elkington & Smallman, 2002: 56). Regardless of this fact, project teams often do not take the management of pitfalls seriously and perform pitfall management on a level not suitable for most projects, posing a major threat of project failure (Cervone, 2006: 256). Organisations in general do not focus on the identification and management of pitfalls that can cause a strategic project to fail. This is mainly due to the lack of guidance from dedicated and knowledgeable staff and a defined approach focusing on issues such as human, environmental, political and technology before and during the project.

This study aims to identify the most important pitfalls present during the implementation of a strategic project in a major financial institution in South Africa and to provide a framework of dealing with these pitfalls.

## Literature review

### Implementing PPM in an organisation

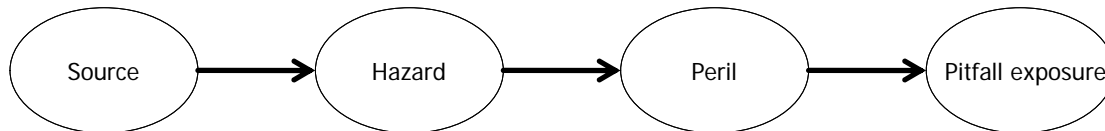
The PMI describes portfolio management as multiple projects working together to achieve strategic objectives. Organisations with poor track records for managing risks normally fail to deliver the expected benefits (Zhou *et al.*, 2008:166; Elkington & Smallman, 2002:55). Furthermore, Martinsuo and Lehtonen (2007:57) argue that a link exists between portfolio performance and organisational performance. As such, it can be argued that an IT department can make a huge contribution to the success of an organisation if it performs satisfactory with regard to the management of its project portfolio.

Thomsett (2004:3) argues that the key to successful project risk management is the establishment of a common terminology. Maizlish and Handler (2005: 181) define a risk as the “potential deviation from expected results”, while the Guide to the PMBOK (Project Management Institute, 2004: 238) defines a risk as some unexpected or unplanned condition or incident that may either adversely or otherwise favourably influence the outcomes of a project.

Risks are also referred to as pitfalls that should be addressed and managed correctly to keep a project from failing (Freedman, 2003:26–28). *Merriam-Webster's Dictionary* (2008) defines *pitfall* as a “hidden or not easily recognised danger or difficulty”. Pitfalls therefore have a negative connotation and may cause harm to the project. Risks on the other hand could be regarded as positive (an opportunity) or negative for a given project. Positive risks are referred to as opportunities that may be used in favour of the organisation to improve the possibility of project success (Ahmed, Kayis

& Amornsawadwatana, 2007: 23). Project teams should exploit the opportunities to the benefit of the organisation. For this reason the term “pitfall” will be used in this paper.

Tchankova (2002:291–292) explains that pitfalls comprise four elements, each forming part of a sequence of conditions



**Figure 1. Components of a pitfall (Tchankova, 2002:292)**

It must be noted that if the source of the pitfall is not present, no pitfall can realise. Likewise, the hazard leads to the peril, which results in the pitfall exposure.

### Pitfall management

Pitfall management comprises the approach of the organisation to dealing with pitfalls; the planning; identification; assessment; response planning; and monitoring and control of pitfalls in order to minimize the negative effects of pitfalls to a project (Project Management Institute, 2004:237–241). This process is described in more detail below.

### Pitfall identification

Pitfall identification is done by assessing the environment, conditions, and other factors prior and during the lifecycle of a project (Levine, 2005: 102–105; Maizlish & Handler, 2005: 181–182). Pitfall identification is aided by using lists compiled from various sources; having discussions with experienced project managers; drawing upon one’s own experience; using a pitfall breakdown structure (PBS); and analysing post-project reviews (Project Management Institute, 2004:244; Iranmanesh, Jalili & Pirmoradi, 2007:999; Hillson, Grimaldi & Rafele, 2006:62; Palomo, Insua & Ruggeri, 2007:963; Barki, Rivard & Talbot, 2001:62–69; Ahmed *et al.*, 2007: 26–27).

Categorising of pitfalls is the first step in the identification process (Hanford, 2008). Categorisation will also provide sets of generic pitfalls that can be dealt with in a generic way. A suitable framework for the organisation to categorise pitfalls, is to base it on the nine knowledge areas of the PMI’s Guide to the PMBOK, augmented with elements acquired from models available in the literature (Project Management Institute, 2004:11; Light & Gerrard, 2007:3–5; Zhou *et al.*, 2008:171–172; Elkington & Smallman, 2002: 52; Thomsett, 2004: 3–10). The main advantages for the organisation are the familiarity the project managers have with the PMI approach and the coverage provided by this framework.

### Assessing pitfalls

Once pitfalls are identified, they must be evaluated and prioritised. Evaluation of pitfalls is often based on subjective measures, but must be handled in a consistent manner (Thomsett, 2004:4–5); for example, the complexity of producing a product should be linked to the product itself,

or events: the source of the pitfall; the hazard that triggers the incident; the peril that is the result of the incident; and the pitfall exposure, referring to the area that is influenced by the incident. This process is depicted below.

and not to the team that should produce the product. Software developers, for instance, have devised means to measure the complexity of a software system by awarding a value to the number of links to existing or future systems or the size of a project (Barki *et al.*, 2001:66; Thomsett, 2004:4–5).

Different people will perceive pitfalls differently. This difference in perspective should be viewed in a positive way since it can result in a comprehensive view of, and exercise in identifying and addressing the pitfalls in a project (Fenton & Neil, 2006b: 1–2). Fenton and Neil (2006a:1–4) propose that evaluating a pitfall is simplified by visualising the scenario if a pitfall should occur. A causal or pitfall map, can assist the team to view the pitfall as a series of events that can damage the project.

The threat that a pitfall poses can be expressed in terms of the expected impact of the pitfall on the project and the probability of the pitfall occurring (Cox, 2008:499). The matrix model depicted in Table 1 describes the probability and impact of pitfalls in terms of numeric values. These factors are multiplied to provide the overall magnitude of the pitfall, using the formula: *Pitfall Magnitude* = *Probability* × *Consequence* (based on Cox, 2008:499). The pitfall is mapped according to its magnitude to the appropriate cell in the matrix.

**Table 1. Pitfall assessment matrix using numerical scales (based on Cox, 2008:502; Project Management Institute, 2004:252)**

		Probability				
		1	2	3	4	5
Impact	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5

The use of different shading or colours (RAG indicators) provides a quick and simple identification of pitfall level to the project team and has value during reporting and feedback sessions.

The pitfall assessment matrix where pitfalls are placed in the low, medium or high categories also serves as a high-level pitfall prioritisation process with high-level pitfalls receiving the highest priority (Cox, 2008:498; Project Management Institute, 2004:251). This provides a

qualitative assessment, as team members award a subjective value to both probability and impact (Cox, 2008: 508). Two pitfalls may end up with the same ranking in a cell in the matrix. The project team may then decide to imply a discrimination factor (Cervone, 2006: 259–260) to break the deadlock.

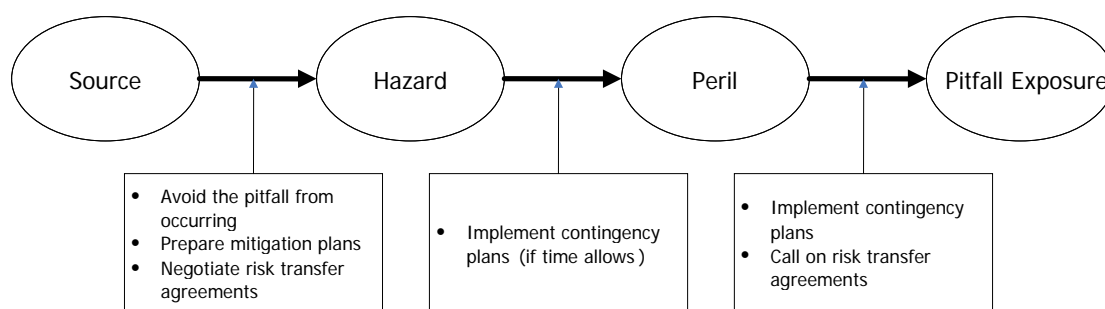
Quantitative analysis predicts losses to the project in terms of money, benefits or time if a pitfall should occur. Quantitative analysis requires a highly objective view of all the objectives and deliverables of the project. Work breakdown structures and derivatives thereof (Iranmanesh *et al.*, 2007:999–1002) will assist the project team to acquire more accurate estimates enabling the team to assess pitfalls quantitatively (Project Management Institute, 2004: 256; Iranmanesh *et al.*, 2007:1002).

### Responding to pitfalls

Pitfalls with highest ranking (indicative of priority) should be addressed first. Pitfalls can be avoided, transferred or

mitigated, depending on the nature of the pitfall; the phase of the pitfall or the project; the current activities; the environment; and the attitude of the organisation toward pitfall management (Project Management Institute, 2004: 240). The project team will have to decide which actions to take to avoid the pitfalls or to minimise the effects should they realise. The project team may also decide to accept the pitfall if its probability or impact is very low (Alexander & Marshall, 2006).

The project team's options to address the pitfall diminish through the sequential realisation of the pitfall phases. This can be explained with Tchankova's (2002:293) model for pitfall identification. As soon as the pitfall has been identified, the team can avoid the pitfall, or mitigate or transfer the consequence of any hazards. Once the hazard has realised, the team can no longer avoid the pitfall from occurring. The model is depicted in Figure 4.3:



**Figure 2. Acting upon pitfall components and events (based on Tchankova, 2002:293)**

One should, however, note that changes in a contingency plan to address a pitfall may not be without additional costs to the project. Thomsett (2004:11) argues that the cost is lower and the effectiveness is higher when one deals with pitfalls before commencing with the project rather than doing so after the project is underway.

### Pitfall monitoring and control

Monitoring and control of pitfalls comprise the identification of new pitfalls, monitoring and re-evaluation of existing pitfalls, and continuous scanning for events that may trigger a pitfall (Project Management Institute, 2004:264). The project team documents the changes in pitfall magnitudes, and also records events that may trigger pitfalls, into a pitfall register. The pitfall register should be continuously reviewed, updated and managed.

Different categories of pitfalls may be dealt with by different role players in the team; for example, operational pitfalls may be addressed by subject matter experts (SMEs), and business pitfalls by business executives, or by the project sponsor (Thomsett, 2004:12; Light & Gerrard, 2007:3–6). Cervone (2006:260) suggests that the project team focuses on only the top ranked pitfalls in order to keep the pitfalls manageable and the focus of the team on the project.

Several strategies can be used to avoid the occurrence of pitfalls in a project, and includes the use of effective communication, providing adequate training and using a structured approach to pitfall management and control (Cervone, 2006:260; Cooper, 1995: 26–29; Tchankova, 2002:96; Ahmed *et al.*, 2007:31). Cooper (1995:28) argues that the removal of the hazard proves the most effective form of control while other pitfalls can be addressed by implementing effective policies and measuring and reviewing compliance and performance.

### Research methodology

The research process commenced with a literature study of the portfolio project management environment. A list of pitfalls was compiled as discussed in the literature. The pitfalls included in the list were obtained from Doherty and King (1998:104–123); Chaudron (2003); Freedman (2003:26–31); Light and Gerrard (2007:3–5); and Zhou *et al.* (2008:182–186). A second list was compiled from post-project reviews of 22 ICT projects that were completed in a major financial institution in South Africa.

The two lists were combined; duplicates removed and the readability of the pitfalls descriptions improved. Discussions with SMEs and other project stakeholders served to augment the list. These steps resulted in a checklist of 170 pitfalls

that may be present during any project conducted in the organisation.

Two rounds of interviews were conducted with 36 project stakeholders to determine if any and if so, which of the 170 pitfalls on the checklist may be present during the implementation of PPM in the organisation.

As the implementation of PPM is a new venture in the organisation, participants had to rely on past experience in other projects and their current knowledge of PPM to predict which pitfalls may arise during the PPM implementation project. The first round of interviews acquired demographic information and interviewees were provided with the compiled list of 170 pitfalls. Interviewees were requested to indicate which of the pitfalls may be present during the project. The first round of interview resulted in a prioritised list of probable pitfalls. 32 pitfalls were selected by at least 60 per cent of respondents to be most likely to be present during the implementation of a PPM. During the second round of interviews, the magnitudes of these 32 most frequently selected pitfalls, were determined. Having acquired the perceived magnitudes of the pitfalls during the second round of interviews, six pitfalls were identified as high-level pitfalls.

The following research methods were therefore applied to the study:

- Literature survey
- Case study: A major financial institution in South Africa
- Interviews

### Population and sample selection

A description of the organisation used in the case study

The main functions of the organisation are that of economic policy making, governance and control over financial institutions in South Africa, playing the role of a financial stabiliser, and hosting a national payment system. These functions are performed by the line departments in the organisation.

The IT department is one of the support departments to the line departments and its function is to enable business functions through ICT. The IT department in the organisation comprises 160 staff members, of whom about 40 per cent are involved in project management. An information session was conducted to inform project stakeholders of the intention of the organisation to implement PPM. The invitees to the session represented all levels and disciplines of ICT PM in the organisation. Clients of the IT department involved in ICT projects were also invited to improve overall representation. Invitees were extended to approximately 80 project stakeholders of whom about 25 per cent attended. The low attendance was not completely unexpected as information sessions in the organisation have historically been ill-attended by project managers and project stakeholders.

To mitigate the impact of low attendance, the presentation was followed-up by including non-attendees into three rounds of interviews. Staff members were included in the interviews based on their availability during the interview period. 36 members participated in the interviews that rendered 26 (72%) and 31 (86%) responses, respectively.

## Results and findings

### Demographic information

Twenty-six responses were received after the first round of interviews. This represents approximately 30 per cent of the population who may be part of the stakeholders of the PPM project. The distribution of the respondents to the questionnaire is as follows:

1. The time that respondents were involved in project management is presented in Table 2.

**Table 2: Period participants' involvement in ICT project management**

Period involved in ICT projects	Responses	Percentage of respondents
More than 10 years	12	46%
More than 3 years up to 10 years	9	35%
0 to 3 years	5	19%
TOTALS	26	100%

Participants' general experience in project involvement was high with 46 per cent of the stakeholders having more than 10 years' experience in ICT projects, while 35 per cent had between 3 and 10 years' practice.

The roles they played in projects between 2006 and 2008 are presented in Table 3.

**Table 3: Participants' roles in ICT project management**

Stakeholder Role	Responses	Percentage
Administrator	5	19%
Client	2	8%
Owner/sponsor	2	8%
Project manager	13	50%
SME	12	46%
Team leader	11	42%
Team member	22	85%
Testing/quality assurance/quality control	11	42%

The roles played by respondents in ICT projects cover the spectrum of ICT PM well, although bias may be toward active project team participation rather than playing a management role.

### Identification of pitfalls in implementing PPM

During the interviews, participants in the study were requested to select those pitfalls from a provided list that

they believe may be present in the implementation of PPM in the organisation. The information acquired from the participants was based on their experience during their involvement in other projects conducted in this, and/or other organisations, as well as their current knowledge of PPM principles. The process of identifying pitfalls was explained and a questionnaire guided participants toward identifying possible pitfalls based on their personal cognitive knowledge.

The frequency of pitfalls selected from the list during the first round of interviews, was indicative of the probability of these pitfalls to be present during PPM implementation. The pitfalls were ranked based on their probability of occurrence. 32 of the 170 pitfalls were selected by approximately 60 per cent of the respondents (15 times out of 26 respondents). These 32 pitfalls were retained for further assessment.

### Assessment of the identified pitfalls

Although participative processes such as the Delphi technique can be used effectively to assess pitfalls present in a project (Thomsett, 2004:10), scheduling more than ten people for a meeting can pose a practical problem in a support department of a major financial institution. By acquiring information from employees using interviews, the participants reveal their personal views on the levels of probability and impact of pitfalls and can provide a suitable result. This is sanctioned by Hannabuss (1996, 22–23). Hannabuss argues that interviews enable the researcher to acquire the opinion of participants, based on their own experiences and allow the researcher to evaluate any differences in opinions.

Because the assessment of pitfalls is based on subjective issues such as personal experience, morale, involvement in other projects, functional responsibilities and circumstances currently being experienced in the organisation, the results are subjective. Therefore, the main output of assessing these pitfalls is limited to determining the magnitude of the individual pitfalls relative to each other (Ahmed *et al.*, 2007: 28).

Quantitative assessment is not possible at this time as no baseline plans are in place and too little detailed information is currently available about the project of implementing PPM in the organisation. Quantifying the assessment of pitfalls done later in the project can assist the team to evaluate the effect of the pitfalls occurring in budgeting, deliverables and time lines of the project.

32 pitfalls, which were selected as being the most probable pitfalls that may occur during the implementation of PPM, were mapped in a matrix. The matrix comprised numerical scales ranging between 1 and 10 on the probability and the impact axes. Using the formula to indicate the magnitude of a pitfall as

Pitfall magnitude = Probability x Impact (Cox, 2008:499).

The average assessment for a pitfall assessed by more than one assessor can be defined as

$$\text{Pitfall magnitude} = \frac{\sum_1^n P \times I}{n}$$

where

n = the number of assessors or respondents, P the probability of the pitfall occurring, and I the impact of a pitfall indicated by each respondent.

The pitfall magnitudes were categorised into low-level pitfalls having magnitudes between 0 and 30, medium-level from 30 up to, but excluding 45, and high-level pitfalls of magnitude 45 and higher. The thresholds were selected arbitrarily (Cox, 2008:499), and are loosely based on threshold levels used to categorise pitfalls magnitudes in other projects in the organisation.

### Results of the assessment of the identified pitfalls

Using the above assessment structure, six pitfalls were rated as high-level.

**Table 4. Assessment values of the top six pitfalls**

Rank	Pitfall magnitude	Pitfall
1	55,3	Timeous project deliverables are hampered by lengthy internal processes
2	55,0	Internal politics between stakeholders may hamper the success of the project
3	50,9	Team members are doing functional work as well
4	50,7	Human resources shortage may hamper the success of the project
5	50,3	Resources are split amongst various projects
6	48,0	A project that seems simple can evolve into something complex

The top-ranked pitfalls categories have been defined during the identification phase.

### Analysing the high-level pitfalls

- Timeous project deliverables are hampered by lengthy internal processes: Policies and procedures negatively influence the procurement and acquisition of resources and services for the project. No third party service may be rendered to the organisation unless a contract has been entered into and the service provider has successfully passed a security vetting process. If conditions are not managed carefully, they may cause delays that could result in missed milestones, upset stakeholders and create an environment of discontent and low morale.

**Table 5: Categorisation of high-level pitfalls**

No.	Pitfall	Category	Sub-category
1	Timeous project deliverables are hampered by lengthy internal processes	Time management	Scheduling of activities
2	Internal politics between stakeholders may hamper the success of the project	Project integration management	Organisational issues
3	Team members are doing functional work as well	Human resources management	Roles and responsibilities
4	Human resources shortage may hamper the success of the project	Human resources management	Human resources availability
5	Resources are split amongst various projects	Human resources management	Roles and responsibilities
6	A project that seems simple can evolve into something complex	Scope management	Scope management, including change control

The list of pitfalls that were identified and assessed can be categorised per level, as depicted in Table 6.

**Table 6: Pitfalls per level**

Level of pitfall	Number of pitfalls
High	6
Medium	24
Low	140

- Internal politics between stakeholders may hamper the success of the project: Functional managers are generally at a higher management level than project managers in a department. As functional managers are individually evaluated according to the performance of their operational division, conflict may exist between their own responsibilities and the provision of resources to project managers in other operational areas. This conflict may additionally result in experienced stakeholders being utilised mostly in their own functional areas and junior staff being assigned to projects that may not have the same impact as those in their own areas. Competition among staff members about to be involved in high-profile projects may also result in ill feelings among staff members.
- A project that seems simple can evolve into something complex: Project team members are also responsible for functional activities in the organisation. Consequently, staff members who were involved in the development of a project now also become responsible for the maintenance of the project. Projects of this nature tend to be endless

and will grow evolutionary. Although scope management is applied during the project implementation, it is not necessarily applied after the project has been formally closed out. Maintenance and upgrading become synonymous, resulting in complex and overbuilt applications. Another reason for this pitfall may be a lack of proper communication between users and developers, leading to scope creep. Users are allowed to change requirements when more information becomes available during the development process. Unless user specifications are properly documented and change control is tightly managed, the scope can become out of control.

The following group of pitfalls dealing with human issues can be handled together:

- Team members are doing functional work as well
- Human resources shortage may hamper the success of the project
- Resources are split amongst various projects

This group of pitfalls may have similar causes. The structure of the IT department in the organisation is functionally oriented. Functional managers form the senior management layer of the department together with the departmental head and the enterprise architect.

In their main role as support for the line departments of the organisation, the functional divisions' main focus is the stability and maintenance of the operational areas in which their assigned business areas function. The functional managers need to decide how to deploy the available resources. Project schedules are normally adjusted to allow for high-intensity business activities such as year-ends or other events. Operational activities will generally have preference above project requirements. This may result in team members being over-utilised and eventually they may not be able to meet deadlines and achieve milestones.

Project continuity becomes a problem since training, operational activities and other project commitments may deter the project members from their focus during a project. No pooled resources are available for project managers, and resources are moved from one project to another according to the priority or urgency of projects.

From Table 5, it is apparent that HR management issues can pose a major threat to the project of implementing PPM (Thomsett, 2004:14; Marr & Parry, 2004:55). By paying specific attention to HR management, the project team should be able to mitigate many of the top-ranked pitfalls in the project.

### Response to high-level pitfalls

Pitfalls may be addressed by

- Accepting the pitfall
- Avoiding the pitfall
- Transferring the pitfall
- Mitigating the pitfall

- Performing any combination of the above actions (Van Wyk, Bowen & Akintoye, 2008:159).

The option of accepting the pitfalls was not viable as this alternative would only be a suitable response to a low-level pitfall (Alexander & Marshall, 2006); it is therefore not applicable to any of the top six pitfalls.

Devising plans and putting the necessary controls in place to avoid pitfall occurrences, enable the project team to focus on the project at hand, instead of spending time and resources to reactively address pitfall occurrences. Reactive practices require the implementation of contingency plans (Ahmed *et al.*, 2007:31) and may imply the employing contingency reserves or fallback plans (Project Management Institute, 2004:265). This approach is not desirable and should be avoided if possible.

Introducing appropriate pitfall management controls into the general policies and practices of the organisation can help to minimise the effect of many pitfalls. Unfortunately, not all pitfall control measures provide a quick-win solution as they may sometimes require a change in organisational culture or the creation of new policies in the organisation. Many pitfalls will therefore have to be dealt with before the control measures can come into play. Residual pitfalls that remain after appropriate controls have been put into place must be addressed individually.

Devising the appropriate controls and long-term plans to improve the probability of project success is beyond the scope of this paper and is therefore left to the project manager. This issue may also be part of a future initiative or study in the organisation.

## Recommendations and conclusion

### Introduction

By drawing on the success of the creation of a culture of safety and quality in the industry (Cooper, 1995:26–29), ICT projects can benefit largely by generating a culture of pitfall awareness. It is important that project teams' innovation should not be suppressed by the omnipresence of pitfalls in acting, reporting and making decisions. One should, however, keep opportunities and pitfalls in mind at all times when acting in a project environment (Thomsett, 2004:12).

By embedding control measures in the project life cycle, many areas where pitfalls were identified can be addressed. Cooper (1995:27) suggests that behavioural changes such as becoming more vigilant, reporting on all incidents, taking fellow team members into account, abiding by policies and rules, and taking responsibility for one's own actions can all be supported by appropriate training. Cervone (2006:260–261) argues that the best way to avoid pitfalls is to create effective communication among project team members and between the project team and the organisation. Implementing any or a combination of these embedded measures will increase the possibility of project success.

## Recommendations

PPM maturity can form part of PM maturity in the organisation (Martinsuo & Lehtonen, 2007:57). Therefore, by implementing PPM, the organisation has indicated its desire to mature beyond normal PM operations. PPM will allow organisations to identify, evaluate, prioritise and select projects for execution based on the strategic objectives of the organisation (Martinsuo & Lehtonen, 2007:56). In this regard they state: "...benefit expectations are expanding from single-project level to the portfolio level."

The potential conflict between the project change manager promoting change and the operational manager who seeks stability; and the general culture difference between functional and project objectives lead to interesting conflict situations that may be the source of many pitfalls in the project environment. Internal politics that has been identified as a possible pitfall source in implementing PPM refers to the issues above and received a high-level rating during this study.

Project portfolios should be used to link strategic objectives to operational projects (Rajegopal, McGuin & Waller, 2007:10) and cover all aspects of the organisation (Blichfeldt & Eskerod, 2007:1; D'Amico, 2005:251–256). The projects in the IT project portfolio serve the running, growing and transforming of the business (Maizlish & Handler, 2005:205).

By successfully identifying and appropriately managing pitfalls that may be present during the implementation of PPM in the organisation, the chances of the project being successful can be significantly improved. By prioritising and limiting the number of pitfalls to be managed, the project team will be able to focus on the actual planning and implementation process instead of overspending resources on pitfall management. Cervone (2006:260) suggests that the project team focus on the top 20 per cent of identified pitfalls.

Issues that can assist in minimising the influence of pitfalls on the project are discussed below.

### Human factors

Human factors are rated as the most important issues in PM (Thomsett, 2004: 14). The skills and experience of the project manager, functional managers and supervisors are tested to the utmost to satisfy operational, project and personal needs. Three of the six high-level pitfalls fall into the category of HR management.

Stakeholders may serve their interests best by entering into service level agreements, statements of understanding, or operational level agreements. This approach will ensure that stakeholders appreciate the context of resource requirements and use and have an unambiguous understanding of project objectives and deliverables and the processes to be followed for amendments, escalations, penalties and incentives.

The involvement of management can help to address internal politics that may hamper the success of the project.

This involvement needs to take place throughout the life cycle of the project (Zhou *et al.*, 2008: 173).

A better project prioritisation process will keep the focus of stakeholders on a balance of projects that are within the resource, technological, time and risk capabilities of the organisation. This will ensure that human resources are applied to projects and project processes where they can contribute most to organisational objectives without being over-extended, overworked and under-trained. This PPM-optimised process can address many human-related pitfalls in projects.

### Resource planning and management

A lack or a low level of resource planning and management is one cause of the human issues experienced in projects in organisations. During interviews for this study, concerns related to unequal work distribution surfaced. Although these concerns pertain to general management and skills retention issues, they were reflected in the pitfalls identified in the project.

The above, in addition to the number of projects accepted by the department and the additional chores of operational activities, place the skilled staff under a great deal of pressure and may lead to bad resource decisions during project team selection.

A recruitment strategy whereby the organisation uses more sophisticated tools to better evaluate the skills of the applicants will help to improve the base skills of new appointees. This will alleviate some of the workload of the skilled base and assist in balancing the distribution of tasks within the organisation. Furthermore, it is important to take note of the fact that an implemented PPM provides a project prioritisation process that integrates with the resource plan to ensure that the organisation has the resources and the capabilities to engage in new projects.

### Roles and responsibilities of project stakeholders

Stakeholders understanding their rights, authorities and responsibilities in the project can lead to improved communications which can serve to remove ambiguity and improve relations. Although the roles of owner, the sponsor and the client may seem small during the development and planning phases, these stakeholders hold the key to the project being deemed a success or a failure (Pinto & Mantel, 1990).

### Using controls to minimise the peril of pitfalls

By putting the appropriate controls into effect, the organisation can improve PM expertise, reduce the influence of pitfalls on this implementation project and on others, and enhance the level of co-existence of PM within the functional areas.

Cervone (2006:260–261) argues that effective communication is the key success factor to avoid pitfalls. Communication achieves common understanding and clarity. Issues are identified and discussed as soon as they

become known, enabling the project team to react in time to avoid an escalation of problems and issues.

Cooper's (1995:26–28) reasoning about creating a safe environment in an organisation through appropriate training can be applied to the creation of a technology mature environment for the project team. The implementation of suitable training can render complex technology understandable and manageable, minimising the effect of the complexity in the project (Cervone, 2006:258).

The organisation can implement project-friendly policies, for example to allow for effective budgeting and procurement processes during the pre-project, planning and execution phases. Changing existing policies and implementing new ones can take months, or even years, to realise and may only serve as a long-term solution for the PM discipline in the organisation.

### Concluding summary

Organisations such as this major financial institution depends on the IT department to provide the appropriate tools, mechanisms, services and means to successfully conduct business in the financial sector of the Republic of South Africa. This aim is achieved through the deployment and maintenance of ICT solutions. This dependence on ICT solutions places major responsibilities on the IT department in the organisation. Project failures cannot be tolerated if the organisation's core business can be harmed through these failures. Improving the rate of project success and throughput is therefore a priority for the IT department and the organisation. The aims are achieved by maturing the PM discipline in the organisation. PPM in the organisation can contribute in achieving strategic objectives (Blichfeldt & Eskerod, 2007:1; D'Amico, 2005:252). This maturation includes a change in traits, attitude, culture, capabilities, business organisation and approach to business delivery on the side of the staff of the organisation.

No guidance or method is available to the organisation to pro-actively and comprehensively identify those areas that can render a project unsuccessful. Risk management in projects was one of the areas that were neglected because of lack of guidance, resources and procedures. Although a project support office was established in 2003, no qualified project risk managers specialise in PM in the organisation.

Using a fixed, systematic approach to identifying and dealing with pitfalls in the project of establishing a PPM discipline greatly reduces the possibility of the project not being implemented successfully.

This paper describes the concepts of PM and PPM as well as a background of PM in the organisation. The anatomy of a pitfall and the categorisation of pitfall types aimed at simplifying pitfall identification. Assessment, prioritisation of, and responses to pitfalls, as well as the monitoring and controls to minimise the number, probability and impact of pitfalls are discussed.

Finally, the role of controls to minimise the number, and alleviate the effect of pitfalls in a project was discussed.

Although not all of the controls have short-term benefits, the organisation can use these controls to enhance the maturity of PM in general.

By following a structured approach to identifying and managing pitfalls during ICT projects, project managers are able to not only develop a better understanding of the technical demands and complexity of the project. Understanding is also extended to other hard and soft issues that may normally be hidden or interpreted incorrectly and that have the potential to undermine the cohesion and productivity of the project team. Through experience, trust and good communication, the project manager can address these issues as soon as conditions triggering pitfalls arise, increasing the possibility of completing the project successfully.

### Glossary of terms

Best	–	“A Best Practice is an optimal way currently recognized by industry to achieve a stated goal or objective” (Project Management Institute 2003:171).
ICT	–	Information and Communications Technology
IT	–	Information Technology
HR	–	Human Resources
PM	–	Project Management / Project Manager
PMBOK	–	Project Management Book of Knowledge (Project Management Institute 2004)
PMI	–	Project Management Institute
PPM	–	Project Portfolio Management
SME	–	Subject Matter Expert

### References

- Ahmed, A., Kayis, B. & Amornsawadwatana, S. 2007. ‘A review of techniques for risk management in projects’, *Benchmarking: An International Journal*, **14**(1): 22–36.
- Alexander, C. & Marshall, M.I. 2006. ‘The risk matrix: illustrating the importance of risk management strategies’, *Journal of Extension*, **44**(2). [online] URL:<http://www.joe.org/joe/2006april/tt1.php>. Accessed 12 Jun 2008.
- Barki, H., Rivard, S. & Talbot, J. 2001. ‘An integrative contingency model of software project risk management’, *Journal of Management Information Systems*, **17**(4):37–69.
- Blichfeldt, B.S. & Eskerod, P. 2007. ‘Project portfolio management—There's more to it than what management enacts’, *International Journal of Project Management*. [online]URL:<http://www.sciencedirect.com>. Accessed 12 June 2008.
- Cervone, H.F. 2006. ‘Managing digital libraries: The view from 30,000 feet. Project risk management’, *OCLC Systems and Services: International Digital Library Perspectives*, **22**(4):256–262.
- Chaudron, D. 2003. ‘Nine pitfalls of organisational change’, [online] URL:[http://www.themanager.org/strategy/Pitfalls\\_Organizational\\_Change.htm](http://www.themanager.org/strategy/Pitfalls_Organizational_Change.htm). Accessed 20 February 2008.
- Cooper, M.J. 1995. ‘Training as a risk control measure’, *Industrial and Commercial Training*, **27**(11):26–29.
- Cox, L.A. 2008. ‘What's wrong with risk matrices?’ *Risk Analysis*, **28**(2):497–512.
- D'Amico, V. 2005. ‘Manage your IT projects like an investment portfolio’, *Handbook of Business Strategy*, **6**(1):251–255.
- Doherty, N. & King, M. 1998. ‘The importance of organisation issues in systems development’, *Information Technology and People*, **11**(2):104–123.
- Elkington, P. & Smallman, C. 2002. ‘Managing project risks: A case study from the utilities sector’, *International Journal of Project Management*, **20**: 49–57.
- Fenton, N. & Neil, M. 2006a. ‘Measuring your risks: Numbers that would make sense to Bruce Willis and his crew’. [online] URL: [http://www.agenarisk.com/resources/white\\_papers/Measuring\\_Risks.pdf](http://www.agenarisk.com/resources/white_papers/Measuring_Risks.pdf). Accessed 30 June 2008.
- Fenton, N. & Neil, M. 2006b. ‘Visualising your risks: Making sense of risks by letting them tell a story’. [online]URL: [http://www.agenarisk.com/resources/white\\_papers/visualising\\_risks.pdf](http://www.agenarisk.com/resources/white_papers/visualising_risks.pdf). Accessed 30 June 2008.
- Freedman, M. 2003. ‘Strategy execution: The genius is in the implementation’, *Journal of Business Strategy*, March/April:26–31.
- Hanford, M. 2008. ‘Toolkit: Identifying and classifying program risks’. [online] URL: <http://www.gartner.com>. Accessed 12 June 2008.
- Hannabuss, S. 1996. ‘Research interviews’, *New Library World*, **97**(1129): 22–30.
- Hillson, D., Grimaldi, S. & Rafele, C. 2006. ‘Managing project risks using a cross risk breakdown matrix’, *Risk Management*, **8**:61–76.
- Iranmanesh, H., Jalili, M. & Pirmoradi, Z. 2007. ‘Developing a new structure for determining time risk priority using risk breakdown matrix in EPC projects’, *2007 IEEE IEEM*, pp. 999–1003.
- Levine, H. 2005. *Project portfolio management: A practical guide to selecting projects, managing portfolios and maximizing benefits*. San Fransisco, CA: Jossey-Bass.
- Light, M. & Gerrard, M. 2007. ‘Toolkit: How to assess project risk’, *Gartner*. [online] URL:<http://www.gartner.com>. Accessed 12 June 2008.

Maizlish, B. & Handler, R. 2005. *IT portfolio management step-by-step: Unlocking the business value of technology*. Hoboken, NJ: John Wiley & Sons.

Marr, B. & Parry, S. 2004. 'Performance management in call centers: Lessons, pitfalls and achievements in Fujitsu Services', *Measuring Business Excellence*, **8**(4):55–62.

Martinsuo, M. & Lehtonen, P. 2007. 'Role of single-project management in achieving portfolio management efficiency', *International Journal of Project Management*, **25**: 56–65.

Merriam-Webster's Dictionary. 2008. [online] URL:<http://mw4.m-w.com/dictionary/pitfall>. Accessed 30 January 2008.

Palomo, J., Insua, D.R. & Ruggeri, F. 2007. 'Modeling external risks in project management', *Risk Analysis*, **27**(4):961–978.

Pinto, J. & Mantel, S. 1990. 'The causes of project failure', *IEEE Transactions on Engineering Management*, **37**(4):269–276.

Project Management Institute. 2003. *Organizational Project Management Maturity Model (OPM3) Knowledge Foundation*. Newton Square, PA: Project Management Institute.

Project Management Institute. 2004. *A guide to the project management body of knowledge (PMBOK)*. 3<sup>rd</sup> Edition. Newton Square, PA: Project Management Institute.

Project Management Institute. 2006. *The standard for portfolio management*. Newton Square, PA: Project Management Institute.

Rajegopal, S., McGuin, P. & Waller, J. 2007. *PPM: Leading the corporate vision*. Hampshire: Palgrave Macmillan.

Tchankova, L. 2002. 'Risk identification—basic stage in risk management', *Environmental Management and Health*, **13**(3): 290–297.

Thomsett, R. 2004. 'Risk in projects: The total tool set'. [online]URL:[www.thomsettinternational.com/main/articles/risk\\_0404/Risk\\_Tool\\_Set.pdf](http://www.thomsettinternational.com/main/articles/risk_0404/Risk_Tool_Set.pdf). Accessed 30 June.

Van Wyk, R., Bowen, P. & Akintoye, A. 2008. 'Project risk management practice: The case of a South African utility company', *International Journal of Project Management*, **26**:149–163.

Zhou, L., Vasconcelos, A. & Nunes, M. 2008. 'Supporting decision making in risk management through an evidence-based information systems project risk checklist', *Information Management & Computer Security*, **16**(2):166–186.