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Essential factors that increase the effectiveness of project/programme risk management

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Abstract

The Office of Government Commerce (OGC) (2005, p. 2) states that “there are several factors that could make the project fail such as the lack of a clear link between the project and the organisation’s key strategic priorities, including agreed measures of success and the lack of clear senior management ownership and leadership”. The purpose of this paper is to investigate factors that contribute positively into increasing the effectiveness of project risk management in an enterprise context. This paper is an outcome of an on-going research project with Rolls-Royce plc. which explores the effectiveness of risk management within the project/programme and further to the organisation context. Observation, Interviews and a questionnaire survey were the main tools of the research methodology. Results of this indicate that there is room for improving the integration risk and programme and project management. In some cases, there is an opportunity for developing in projects/programmes a more risk-aware culture. The contributory factors are leadership and senior management support, different education and training for all the levels of the organisation, support from a dedicated risk manager, communication and use of the risk management data for making decisions. All the above are factors that contributes in increasing the effectiveness of risk management process in the organisational context by creating a more risk aware culture.

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1. Introduction

In the rapidly changing economic environment that companies are operating within, project, programme and portfolio management has become an emergent discipline for delivering successful organisation outcomes. Shi (2011) argues that if project and programme management is implemented in the right way, then it could add value to the organisation both strategically and tactically. A way for improving effectiveness in the project and programme management is with the better use of risk management. In recent years Enterprise Risk Management (ERM) philosophy has been used, instead of the traditional approach, to provide a more holistic approach to managing project and organisation risk. Good risk management allow practitioners to manage objectives more effectively, however for this holistic approach to be successful, it is essential that there is an effective top down leadership, a dedicated risk manager and appropriate education and training. In order to obtain the maxim benefits all the three above factors need to be implemented together.

2. Literature Review

Many organisations nowadays include the model of project management for strategic implementation and fulfilment of strategic objectives (Artto and Wilkinson, 2005, Winter et al, 2006). Current literature indicates that by splitting an organisation into projects, a company has a better position in the environment that they operate within if they approach it in the right way both strategically and tactically (Thirty, 2002; Crawford and Bryce, 2003; Kelly et al., 2004; Winter and Szczepanek, 2008; cited in Qian, 2010). Shi (2011, p.296) argued that two things need to be addressed in order to maximise the value of a project;

- The correct approach to implementing project management,
- The suitability of the organisational environment for project management

The new APM Body of Knowledge (2012) makes a clear differentiation between the terms of programme/project and portfolio, were it was argued that the context of projects; programme and portfolios that operates will always be under a host organisation such as government, company or charity (figure 1). Therefore there is a clear relationship between organisation and programme/project and portfolio. Figure 1 indicates that some programmes and projects could exist as standalone under the organisational context and others under the portfolio. Therefore, projects, programmes and portfolios are not seen as a discrete part of the organisation and it is always exist under an entity with mission, vision and goals.

![Figure 1: Organisational Context](Source: APM (2012, p.7) Figure 1.1:Context)

Naaranoja et al. (2007) investigate the mission, vision and strategy of organisations in relation to the projects, programmes and portfolios. According to Naaranoja (2007, p.659) Mission is the reason why the organisation exists, vision is the future state and strategy is how to achieve the vision. However, as Naaranoja et al. (2007) adds, for projects to use those three factors is quite rare even though it is knowledge that programmes, project and
portfolios should support the overall strategy of the organisation. Naaranoja et al. (2007) in the same paper provide a slightly modified version of Turner (1999) levels of organisation in relation to objectives and strategy (figure 2).

Figure 2: Organisation levels in relation to objective and strategy
Source: Naaranoja et al. (2007, p.661) Figure 1 The levels of objectives and strategy formulation (slightly modified from Turner (1999))

The above evidences are shown that projects, programmes and portfolios are not seen as a discrete part of the organisation and are a part of corporate strategy. Therefore, it could be argued that project/programmes objectives are a subset of organisational objectives and serve the same mission, vision and goals. Therefore risk management should be used as a vehicle for achieving project/programme and further organizational objectives. As Lawrence et al. (2009, p. 301) states organizations should not see risk management from a silo based perspective; the trend is to take a more holistic view which is considered to be enterprise risk management. To date there is little research on the transition from the traditional risk management approach towards a holistic Enterprise risk management approach. Successful ERM takes a broader and more integrated approach to all the risks that affect a company’s strategic objectives.

Review of the literature on programme/project management research indicates factors that contribute to successful implementation. As already discussed the link of the corporate strategy to project, programmes and portfolios should be clear and effectively flow down to the organisation. Shannon (2011) states that there are several factors that could make the project fail such as the lack of a clear link between the project and the organisation’s key strategic priorities, including agreed measures of success and the lack of clear senior management and ministerial ownership and leadership.

PM leadership might involve the promulgation of awareness of this new, broader role for projects. The literature also details features of a “projects culture”, including: open, two-way partnerships with customers and suppliers and a shared, common project language (see, for example, Dubinskas, 1993; Boardman, 1994). PM leadership might be expected to ensure the PM system supports the development of such a culture. The importance of good leadership is stressed in the literature by several other authors (Cicmil, 1997, Longman and Mullins 2004, p. 57; Barber and Warn, 2005).

Another view comes from Cerny (2006) who argues that leadership in project management has to take in to consideration the management of emotions for managing the project successfully. Cerny (2007) describes eighteen emotions (such as satisfaction, happiness, stress, fear, jealousy, Anger, Luck etc) that influence the project management process and in most cases caused by communication. In order to understand better the communication and its influence on emotion Cerny (2006) uses the model of Friedemann Schulz von Thun “the 4 sides of an information” for describing the link between the receiver and the sender. Therefore controlling the emotions could be a way of achieving results in the project environment. Increasing the effectiveness of communication among the team members is essential for the project success. Vartiainen (2004 cited in Baroudi 2007) argues that communication between team members is an important factor in ensuring project success. Further communication is vital for team members to share common goals and understanding in the project context. It is important to note that several researchers identify the common language as an important factor influencing communication (Qureshi et al., 2008; Demir and Kocabas., 2010). Therefore, it could be argued that the creation of a common language
could increase the effectiveness of the flow of information in all four dimensions.

<table>
<thead>
<tr>
<th>Content</th>
<th>Message includes a content, which forms about things and process in the world.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relationship</td>
<td>Throughout the relationship aspect the sender of a message tells the receiver indirectly what she/he things about the receiver. This is communicated through formulation of a message, tone and other non-verbal signs.</td>
</tr>
<tr>
<td>Self-revelation</td>
<td>Every message includes a message about the sender. This could be the personality or the actual existence orientation. This can happen self-conscious or unconscious.</td>
</tr>
<tr>
<td>Appeal</td>
<td>Through the appeal the sender tries to influence the receiver and to lead him on a specific direction</td>
</tr>
</tbody>
</table>

Table 1: Four dimension of information  

Demir and Kocabas.(2010) presented a five level maturity model in project management, (figure 3). This shows that common language and terminology is on level one of the maturity model, while the recognition of the common process comes at the level two and the combination of all to a standardise approach cross the organisation come at level three. At level four, there is a need for process improvement through a benchmarking process which is followed at level five by the use of benchmarking information for continuous process improvements. Therefore, as already explained, common language is used as a factor for increasing effectiveness in projects. However, a gap exists in the literature on the kind of information that formulates this common language.

![Figure 3: The five levels of project management maturity](source: Demir and Kocabas.(2010, p1643) Fig 1 “The five levels of project management maturity”)

In APM (2012, p.100) “information management is the collection storage dissemination, archiving and destruction of information. It enables teams and stakeholders to use their time resource and expertise effectively to make decisions and to fulfil their role” Having reviewed the literature, the top down approach in the organisation hierarchy is often used most. There is a limited literature concentrating on the bottom-up approach. APM (2012, p.33) also discuss the organisational level of maturity in five levels:

Level 1: risks arbitrarily classified and rarely, if ever qualified  
Level 2: some projects recognise different categorisation of risks  
Level 3: risks identified, assessed and controlled in accordance with the recognised procedures, across all projects  
Level 4: projects able to demonstrate resource and budgetary implications of risks throughout the project lifecycle;
Level 5 risk assessment underpins all decision-making

Again, it is important to point out that from the above points maturity is defined as the use of the risk data for decision-making. However, there is a gap in the literature as it was pointed out earlier on regarding the information that leads to the correct data for decision-making. In addition, it is vital for these data to be in a language that corporate and projects understand at the same time.

So this research leads to the investigation of the area of knowledge management and to try to describe the relationship between the language that is created by information/data, and how knowledge that allows practitioner to make effective decision is created. APM (2012, p.22) “refers to knowledge management as the systemic management of information and learning. It turns personal information and experience into collective knowledge that can be widely shared throughout an organisation as a profession”. In the literature there are several definitions about knowledge. Wiig (1997 cited in Rodriguez, 2010, p.52) defines KM as: “... the systematic, explicit and deliberate building, renewal, and application of knowledge to maximise an enterprise’s knowledge-related effectiveness and returns from its knowledge assets.” Alavi and Leidner (2001 cited in Rodriguez, 2010, p.53) state that KM requires more than IT; it requires the creation of a means to share knowledge, information processed by individuals and adapted to be communicated. While Ergazakis et al. (2002) refers to Knowledge management as “the process of generating value from the intangible assets of an enterprise.”

A widely agreed definition is introduced by Marakas in 2003 in his book Decision Support Systems where knowledge is a combination of available data, process, policies, procedures and general information. Therefore, it is a three stages process where data becomes information and then knowledge. Marakas (2003, p.4) argues that: “A decision support system is a system under the control of one or more decision makers that assists in the activity of decision making by providing an organised set of tools intended to impose structure on portions of the decision-making situation and to improve the ultimate effectiveness of the decision outcome”. However, information ought to be in the right format to allow the programme/project practitioners to make effective decisions. There is a responsibility of the team to make the right decision based on data gathered. Hence, programme/project management practitioners need to have in addition, the right level of education & training for allowing them to build a knowledge that could contribute to the better judgment of the available data and therefore better decision making.

Another factor that increases the effectiveness of project management is education and training. Having reviewed, organisation hierarchy, language, leadership Qureshi et al (2008, p.380) stress the importance of how the organization plans and manages its project management staff, gives training and ensures its staff’s career development both for current and for future projects. Thomas and Mengel (2008) argue that interest in project management education and training is growing significantly (this is also supported from the PMI institute, 2000). Teaching and learning was identified as a major theme in the debate on re-thinking project management (Cicmil et al., 2006; Winter et al., 2006; cited in Ojiako 2010, p.268). Education and training could help in the development of a common language in the project. Project management comprises a wide range of roles and responsibilities and this must be reflected in the educational programmes (Baroudi 2007, p.126). A way of increasing education and training in less time for a set period in project is with the use of a dedicated risk management resource.

Ward (2001) argues that there is a need for a corporate risk manager whose responsibility is to oversee the practice and the development of risk management throughout the projects and organisation the role of risk manager is not to manage the risk on behalf of the team members instead is to guide, facilitate risk session provide education training and support for making people to recognize true risks and their use in the decision making process. This is supported by AIRMIC guidelines which suggest that the corporate risk manager should act as coordinator and advisor to the project/programme. Having a dedicated risk manager helps the organisation to increase the understanding of risk data as well as the ability to communicate them effectively.
3. Methodology

Rolls-Royce plc. is selected as a case study company as representative of the Aerospace industry. Rolls-Royce is strategically important in the UK aerospace sector and hence the country economy, so the findings could be beneficial to the whole aerospace sector (Khan, 2009, p.120). Two programmes were selected to be investigated further within the organisational context. Both programmes were aero engine design and development projects with a similar size in terms of duration (5+ years), and were similar in the levels of technical challenge (technical risk) involved. Project A was undertaken within the Civil Aerospace Sector and Project B was undertaken within the Defence Aerospace Sector. The project was steered by a steering group with a mix from academic and industrial advisors that met regularly to monitor progress and ensure the achievements of the organisation’s expectations on the deliverables from this research project as well as meeting the academics requirements.

The author decided that the research would use both qualitative and quantitative techniques which are referred as a multi-method approach. This is deployed by many authors engaging with large projects. Denzin (1989, p.307) states that “By combining multiple observers, theories, methods, and empirical materials, sociologists can hope to overcome the weakness or intrinsic biases and the problems that come from single method, single-observer, single-theory studies.” For the research logic also the author used also a multi-method approach where both induction and deduction where use respectively. In the initial stage of the research an induction approach was more appropriate while the author was gaining understanding about the organisation and more qualitative data involved, as the emphasis was to review the literature and organisational context. In the next stage while the author collected data from Rolls-Royce and analysed both qualitative and quantitative a deductive approach was more appropriate.

The author conducted an investigation into the internal policy, process and procedure for risk management along with observations of how it was implemented in the organisation, in order to investigate and develop an understanding of the organisational environment. The organisational knowledge gained along with investigation of the current literature helped the next stage of the research where semi-structure/unstructure interviews were conducted. Finally, a survey questionnaire was developed for investigating a wider population of programme management practitioners. The research sample took into consideration the 4-L-C system (four level certification system) adopted from the International Project Management Association (IPMA) for categorising sample upon three aspects of the IPMA’s definition of competence (Knowledge + Experience + Behaviours). For interviews only the top three levels were agree to be investigated, while the questionnaire survey goes down to all the levels.

Key findings identified from interviews were used for developing an extensive questionnaire comprising by 54 questions concerning different factors affecting and influencing the risk process and data treatment. The response rate exceeded 74%. Likert scale types of questions were mainly used in this research study, which resulted in the generation of Ordinal data. Data collected from the other question types were Nominal data. The combinations of the one-tail or two-tail Z2 and Z3 tests can be useful for testing normality against the constrained skewness and kurtosis (Mudholkar, et al 2002). While testing the normality of the data through SPSS the z-values of majority of data variables was found to be above +2 to -2 range so this supports the argument that data was not following a normal distribution. Possibly, skewness and kurtosis give a reasonable indication of the style of sample distribution (Kerr, et al., 2002). Considering these arguments and since the data are not normally distributed, and taking into account the fact that ordinal and nominal variables are included, then non-parametric statistical tests were deemed as the most appropriate for the data analysis. Taking into account the above considerations, three different types of SPSS statistical tests were used: Descriptive statistics (through SPSS and Excel), Mann-Whitney U test and Kruskal Wallis test.
4. Findings

Findings of the qualitative data indicate that there is an opportunity for increasing the risk management awareness within the programme management context. Tailored education and training for risk management at every level of the organisation will contribute positively in developing a more risk aware culture. Results from semi structure/in–depth interviews indicate that across the organisation the level of importance placed on risk management is very high (90% agreed with the statement). Most of the interviewees (82%) believe that risk management is one of the most effective decision making tools. However, in some cases focus needs to be given to translating risk data to information in order to allow programme team members to be able to make decisions, communicate and escalate risk appropriately.

Better use of risk data in the decision making process will lead to more focus from senior leadership teams and as a consequence also the lower levels of the organisation structure. At this point it is important to note that 100% of the interviewees indicated that risk management is a tool for supporting programme and project management.

The effectiveness of both project/programme management will increase if risk management is undertaken holistically and this will have an effect on the wider organisation. This could be achieved by a risk manager acting as the focal point within portfolio, programmes, projects and the rest of the organisation. In this way the risk manager acts as a link between the different levels of the organisation to ensure strategic objectives are successfully translated, communicated and achieved. Most of the interviewees (82%) believed that there should be dedicated resource (Risk Manager). In addition, the questionnaire survey indicated that the majority of the respondents (67.6%) agreed or strongly agreed with the need for a dedicated risk manager and only 21.1% strongly disagreeing or disagreeing with it. There was a small percentage (11.3%) of the respondents who were neutral towards the statement. The fact that the majority of the interviewees and questioner respondents agreed with the statement demonstrates a positive attitude towards risk management. There was no statistically significant difference found based on location, education or sector. However, findings indicate that there was a statistically significant difference based on programme (p=0.027, U=66.5). That means that the respondents of the programme B more strongly agreed (86.7%) with the need for a dedicated risk manager than those of the programme A. Findings from programme management practitioners located in programme B argue that the use of a dedicated resource should be for a period of time and not throughout the whole programme lifecycle. The average time that was recommended by most of the interviewees was 18 months for of programmes with this levels of complexity and budget.

The analysis of the quantitative data indicates that overall, the large majority (83%) of the respondents believe that it is very important to have an effective Risk Management process, since all of the respondents believe that effective Risk Management can benefit the organisation as a whole. In programmes such as the programme B programme management practitioners see more tangible benefits. A statistically significant difference was found between programmes (p= 0.006, U=106). The programme B questionnaire respondents perceived the benefits to be greater than those of the programme A.

100% of programme B interviewees responded that risk management is now fully embedded in the programme culture. However, it could be argued that the fact the majority of respondents from programme A propose risk areas of improvement shows also an element of positive attitude towards risk management and creates a positive environment for any proposed changes in the risk management process.

The findings of the qualitative research show that there is an opportunity of improving programme management practitioners’ level of understanding of the risk management policy, process and procedures. Survey results show that 47% of employees know about the existence of the policy, process and procedures.

Survey results indicate that there is a significant proportion (68%) that has undertaken a corporate risk management training course. However, there was one statistically significant difference found between programmes (p=0.009), where programme A seems to have a higher attendance of the Risk Management courses.
than programme B. However, it could be argued that this is not a negative factor for programme B as the rest of the responses identified that programme management practitioners’ knowledge and awareness seemed to be higher. This could be due to the existence of a dedicated risk manager as an alternative way to the formal risk training so that the programme B team members need less training courses. This is because a Risk Manager increases practitioners’ level of education and awareness on to day to day basis by supporting and guiding programme management practitioners.

Quantitative analyses indicate that 32.4% of respondents believed that the senior management leadership team had a high awareness of Risk Management. The large majority (67.6%) believe that there is an opportunity to increase risk awareness at this level of the organisation. There was a statistically significant difference found based on programme (p=0.012, U=62). It could be argued that programme B has a higher awareness of Risk Management than the programme A. Therefore, it could be argued that practitioners from programme B seem more confident in the application of Risk Management throughout the project lifecycle. Qualitative findings also indicate the importance of leadership in increasing the effectiveness of risk management in project/projects (90% agreed with the statement).

Survey findings also indicate whether the respondents believed that the guidance they receive from the risk function is effective. The large majority of the respondents (79.2%) believed that it was somewhat effective while 13.2% of them believed that it was not. It is important to note that there was a statistically significant difference found based on programme (p=0.032, U=54). The findings indicate that programme B seems to receive more effective guidance regarding both tools by comparison to programme A and therefore more respondents from programme B agree or strongly agree with the statement. This maybe due to the existence of a dedicated risk manager who is successfully communicating, guiding and supporting the programme in line with the corporate objectives, standard tools, processes and techniques.

5. Discussion and Conclusion

In 2011 Rolls-Royce announced an order book that stood at £62.2 billion from 59.2 billion in 2010. Looking back in history firm announced a 76 per cent increased on the order book from 2006 to 2007. Based on the data from the last decade the order book has increased 263 per cent from 2002. Therefore, it could be argued that Rolls-Royce is now four times bigger than it was in 2002 and has stated it intends to double in size in the next decade. Consequently it is essential that the company’s processes and procedures are tailored to the continuously changing environment for better supporting this challenging target. The above analysis shows that there is a direct link between risk management and impact on strategic objectives. Therefore it could be argued that by increasing the effectiveness of the risk management process it would have a positive impact on achieving portfolio, programme and project objectives which leads to an increase in the chance of achieving organisational objectives.

A holistic, integrated enterprise risk management process should ensure that there is maximum probability that the vision and mission can be met. In the current literature the dominant view is of a top-down approach to the organisational management. However, it could be argued that, for risk management, a two way approach is more effective with a risk manager in the middle acting as an interface between the senior and lower levels of the organisation to ensure the proper integration of project and enterprise risk management. This will allow the organisation to grow in maturity to a point that this is no longer required. Dedicated Risk Managers should be appointed on projects/programmes dependent on the scale and complexity, for a limited time to set up the infrastructure, implement corporate policies and procedures and influence strategic management. Unless risk management is completely embedded in the organisation’s culture it is recommended that a dedicated resource is appointed to ensure process compliance and effective use of risk information in line with the organisation risk appetite and strategic objectives.
Many authors believe that without good leadership the project risk management process is just a meaningless phrase. “Even if the risks are fully and completely understood by all parties affected, and the risks are thoroughly, continuously and visible assessed and managed, you still need a project management team that can provide leadership and actively control risks” (Charette 1996, p.116). However, good leadership skills arise from experience. Experience is an outcome of past events; those events may be both successful and unsuccessful situations. Bad situations tend to be more readily remembered by those involved. However those suffering the consequences create an invaluable source of experience and this could provide a valuable tool for leaders. Good leaders take advantage of the knowledge gained from past experiences to develop successful strategies for the future situations.

Risk management must not only be seen to be considered important by senior management but they should also understand how to make best use of the information generated by the risk management process. In order to increase the awareness of the benefits of risk management among top executives it is good practice to promote education and training for senior managers. This has been shown to increase their ability to use risk management effectively.

Findings from the literature indicate that there is a lack in the definition and accountabilities of the risk manager. A Risk manager has been seen until now as supporting policies, systems and procedures and not involved in the overall strategic management of the organisation. The main contribution of this research is to recommend the use of a dedicated risk manager to act as an interface between the project and the enterprise and to ensure the risk data gathered throughout the project is analysed and presented in a way that allows the project risks to be expressed in term of the enterprise risk. The research has demonstrated that for this to work effectively there needs to be leadership commitment, an effective risk tool-set and the means of translating project risk into enterprise terms and this is pulled together through the role of the risk manager.

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