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A Contingency Framework for Addressing Failure in Information Systems Projects.

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Abstract: Projects to implement new Information Systems are activities marked by a high degree of failure. Public and private sectors have both provided examples of extreme failure, leading to considerable loss of revenue. The National Health IT programme in the UK, for instance, cost an estimated £10 billion in a critical project delivery failure [1].

The failure of systems to deliver the required improvements and, in some instances, keep key customer data secure, has also led to further organisational costs, in terms of time, reputation, revenue and opportunity. The requirement to achieve success has become greater for IT projects as organisations' value chains are increasingly dependent on technology to deliver goods and services, hence obtain competitive advantage or maintain market position.

The approach to IT project implementation problems has, generally, been focussed on critical success factors and risk analysis. This paper examines the alternatives via empirical research and an analysis of key themes in the literature to propose a holistic approach, based on a systemic perspective of project management. An outline contingency framework is proposed, highlighting critical areas to address, in order to plan and resource projects. The objective is to reduce the impact of failure on the organisation, hence limit the resources wasted on IT project failure.

The systems viewpoint allows a holistic perspective and in terms of this research, it is based on the premise of the social construction of risk, where the failure of IT projects is rooted in the societal context, rather than simple mono causal attribution.

This environmental perspective allows a deeper understanding of such failure to be accessed and should permit the creation of measures to assist future projects and reduce or prevent the occurrence of wasted resources in such activities.

Keywords: Information Technology, Project Management, Systems, Project Failure

1 Introduction

The systems perspective is an appropriate mechanism for examining IT projects. Checkland and Scholes [2], Senge [3] have helped to define the general systems approach to analysing organisations and their environments. This has been reinforced and extended by more recent publications, such as those of Gardiner [4] and Kapsali [5]. This approach fits the discipline of IT, as an appropriate mode of analysis, due to the systematic nature of technical work, which defines the mentality of its workers. An example of the systems approach to IT research is provided by Blair and Orgee [6]. The latter work has been accessed, in order to provide a provisional framework for classifying IT systems in terms of the potential for failure. This will assist in defining measures to avoid and reduce the organisational impact of this outcome. The use of a contingency framework enables different potential responses to be determined, depending on the prevailing internal and external factors affecting the IT project. An example is provided by Poulymenakou and Holmes [7], proposing a contingency framework in IT system failure.

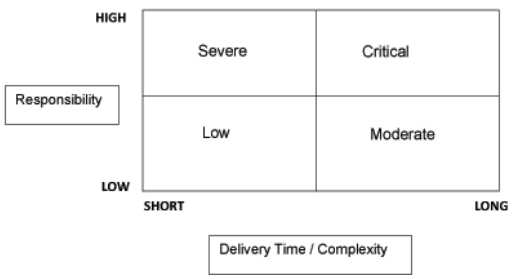
Research into 7 business-critical IT projects was accessed utilising Blair and Orgee's work [6] and the underlying research, which employed qualitative methods and a thematic analysis of the data. This allowed the researchers to gain a perspective on critical success factors, in respect of IT projects that had varying degrees of perceived success. The type of IT project could thus be used as a classification.

Three key factors, in terms of potential risk and development emerged from examining this work, namely responsibility, duration of project and degree of difficulty, considering the current state of the organisation's technical knowledge. Responsibility is here defined as organisational, so that an in-house systems development project created entirely by the IT personnel would be the most difficult. The extent to which the project could be assigned to external organisations would reduce the

organisational exposure. The duration of the project is the planned length of time to completion, linked to the degree of technical complexity embodied in the new IT project. A long delivery period for a system written entirely in house would represent the highest level of risk and hence likelihood of potential failure. The use of new software tools and techniques will exacerbate this position. If these two factors could be reduced, for example, a shorter delivery time or reducing the level of technical complexity (perhaps by reusing existing code or improved specifications or using existing programming languages and technical tools) then the potential for project failure would also be reduced. The external environment of the IT project can also affect the level of responsibility. Changing attitudes to resourcing the project due to personnel changes and the strategic importance of the project to the organisation, for example in helping to increase market share, will affect the perceived importance of the project [6]. The project's environmental factors are generally received, in that they cannot be influenced by the project manager only accommodated, in terms of tactical delivery of prescribed objectives.

This permitted a simple matrix framework, providing four basic categories of projects to consider, as shown in diagram 1.

Diagram 1 - Framework for Examining IT Projects



A full stakeholder analysis should be conducted and this needs to identify all of the key personnel who influence or are affected by the project [9]. The objective is to understand and map the decision processes for the project. A comprehensive communication plan can then be written, determining the frequency and mode of contact with these stakeholders. The relationship with stakeholders should be viewed as dynamic and hence these arrangements need to be revised, as appropriate during the course of the project. An example of such an intervention was the failure to include the unions in the decision processes for a public sector project. The result was that an embargo was placed on the jobs to run the new system, leading to the new system being run by temporary staff recruited from outside the organisation. This created resourcing problems and inefficiency from the commencement of the project, as staff had to be recruited and trained to operate the new system.

The need to consider the minority stakeholder is also important [9]. This comprises stakeholders who are not viewed as being powerful in terms of project decisions. An example is a member of the public affected by the organisation's decisions. The use of social media to widen support for a protest and the power of lobbying to create pressure to reverse the decision needs to be considered, as the organisation's image and market could be adversely affected.

Appropriate tactics need to be decided in respect of key stakeholders. Consultation, education or negotiation may be required to further the project aims in the organisation and its environment. All of these will have a potential cost in terms of time and resources and hence cause adjustment to the project plan and budget.

4 Risk Analysis

A full risk analysis should be conducted, to assess the general and specific threats to the project. The latter can be categorised as internal or external to the organisation. Internal threats could include competition for resources and opposition to the project by key stakeholders. External threats could include action of competitors and loss of support from financial backers. A plan for addressing or accommodating such risks should be constructed. Examples could be providing an emergency generator for the servers, in the event of an interruption of the supply, and securing potential alternative funding, in case the regular backer withholds funding. A businesses continuity or disaster recovery plan can be formulated to address general risks. This comprises the loss of key resources for different periods of time. The threat level corresponds to the period and timing of the loss of resource. A payroll system may be unavailable for several days without a major impact on the business, however a longer period or timing at payroll processing deadline may require the provision of contingency arrangements to process payments on time. The pension payroll system had full contingency arrangements, which meant that a new server could be setup with office space for staff within 24 hours of an emergency being declared. The cost of this insurance

was considered to be less than the implications of a failure in this area.

5 Contracts

The delegation of responsibility for all or part of an IT project to another party usually requires a robust formal agreement. The aim is to ensure that both parties are clear on their roles and responsibilities, in respect of the project. The reason that IT projects where an external supplier has a key role are regarded as lower risk is because there should be a transfer of responsibility. This means that the contract should clearly assign responsibility for the designated project tasks. The payment for the latter should, ideally, occur on delivery and acceptance of the project tasks. Quality and delivery times should be should be specified and penalties for failure should be explicitly stated. The ultimate form of the contract will depend on the power relationship between the supplier and organisation. The higher this differential then the morelikely the contact will be biased to favour the more powerful party. The pension system supplier, for example, had a near monopolistic position in this niche market. The result was that contracts with the latter did not contain penalty clauses, as the firm had the power to dictate these terms.

The failure of an in house resource can be similarly covered. The loss of key programming staff, for example via strike action, could be covered by designated contract programmers. The effect on the project plan and budget would need to be recognised and communicated to key stakeholders. There would be a 'dislocation cost' to the project as these staff were hired and learned to perform to the required level in the specific environment. There would also be the potential for ongoing problems at the end of the strike, in terms of organisational disruption associated with the returning workers.

6 Governance

The decision structures for the project need to be defined and recognised by the key stakeholders. A project is, by definition, a temporary undertaking to achieve specific objectives. The organisation thus needs to ensure that the project manager and team are empowered to make the required decisions and have been allocated adequate resources for the duration of the project. Clear responsibilities need to be assigned and recognised within the organisation. The pension system project, for example, had two project managers from different departments, thus leading to issues of power and control that had to be resolved in order for the project to progress.

The critical factor in this area is understanding the formal and informal power structures of the organisation. The presence of hierarchical, 'role' power and 'expert' power should be identified, to ensure the success of the project. The project manager needs to understand the organisation in terms of the formal 'rules' to follow in planning and resourcing the project and also be able to utilise informal sources to gain information and assistance, as required. The discipline of IT is particularly susceptible to the influence of 'expert' power as the knowledge of key tools, languages and systems is critical to this area.

7 Tactics

The following tactics can be applied within an organisation to attempt to reduce project risk and the possibility of failure -

7.1 Reduce the duration of the project.

The longer the project then the greater the potential for problems and failure. It appears to be more difficult to maintain effort, resources and focus for a longer period. The projects with longer periods tended to have more serious problems. The latter also gave more time for any opposition to organise resistance.

7.2 Delegate key tasks and control with strong contracts.

This should permit some of the risk of failure to be delegated to another party. The contract should provide clear statement of obligations, costs and penalties, in respect of the IT project deliverables.

7.3 Reduce organisational dependence on the project.

This could be achieved by ensuring suitable contingency planning, so that the organisation can maintain key services in the event of project delay or termination.

The use of parallel running gives an example of such a measure. This was utilised on the new pensions payroll project, with the old and new systems being run in parallel and the switch to the latter only occurring when the reports from both systems had been reconciled.

7.4 Reduce the complexity of the project.

The could be done by using established programming languages, rather than new tools and techniques, which increase the risk of failure. Improved structuring and modular delivery of faculties can also

facilitate implementation. The new pension system is an example of such a project delivery, with system modules being delivered and installed by the software provider (such as pensions administration, pensions payroll and accounts) and payment being given on acceptance of the software. This reduced the risk of failure associated with this project.

7.5 Information Review

The attempt to avoid failure requires the construction of an information system to advise on the setup and progress of the project. This should allow monitoring and assessment of feedback at appropriate points. The information needs to be interpreted appropriately and a suitable response selected and implemented. The feedback mechanisms should provide sufficient information of the correct level of quality at the right time to inform the decision. This model should use the experience of the project and participants in order to reflect and consider the appropriate action at key points. This is the experiential learning cycle (as per Kolb [10]). The final stage is to conduct a project review with the main participants in order to capture the learning for future projects and ongoing maintenance.

This project information system needs to capture the learning during the project and ensure that key information is shared by the required personnel. This should also provide for filtering the information so that the information is shared at the appropriate level and adequate security controls are applied to ensure that only the approved staff have access. The initial stakeholder analysis should provide the basis for determining the correct information provisions and systems for the project.

8 Conclusion

This paper has considered the area of IT project failure in a holistic manner, using examples from practice. A contingency model for defining systems in terms of potential for failure and suggested possible tactics to reduce the likelihood of this event have been made. These could be considered using further research into other systems, to evaluate and extend these proposals.

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