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Purchasing Key Information Systems The Bord Gais Eireann (BGE) Case

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Purchasing Key Information Systems – The Bord Gais Eireann (BGE) Case

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RÉSUMÉ

Les dirigeants d'entreprises sont de plus en plus conscients de l'importance extrême du déploiement équilibré de leurs moyens informatiques. La sélection des systèmes clefs de l'entreprise ne peut être un succès que si elle se fonde sur une bonne compréhension de ses mécanismes internes et de son environnement, et des technologies disponibles. Trop d'entreprises ne tirent pas profit de leur informatique parce qu'elles n'ont pas su intégrer les dimensions managériales et technologiques de leurs projets Les systèmes ainsi développés ne correspondent pas aux besoins parce que leur analyse et leur sélection n'ont pas intégré les critères de tous les acteurs organisationnels impliqués.

Dans cet article, nous présentons une étude de cas de Bord Gais Eireann (BGE) qui s'est concentrée sur le processus de sélection d'un système clef. L'article met en valeur les spécificités des projets informatiques de ce type et leurs implications pour la conduite de ces projets. En conclusion, un modèle pour le processus de sélection et l'achat de logiciels clefs est présenté qui insiste sur la nécessité d'intégrer les dimensions managériales et technologiques des projets informatiques.

Mots-clés : Achat de systèmes informatiques clefs, Conduite des projets, Modèle du processus de sélection.

ABSTRACT

Senior managers have become aware that the management of the information system portfolio of their organisation can ultimately lead to success or failure. The successful selection of mission-critical information systems begins with an understanding of the external and internal business environment and of the technological environment. Many organisations have failed to reap the benefits of their IT investments because they never achieved the required level of integration and cohesiveness between business and IT. The resultant information systems fail to meet the business requirements of the organisation because system requirements are either ill-scoped or the selection process they followed is not business driven.

In this paper, the case of Bord Gais Eireann is used to examine the process of selection of a mission-critical system. The paper outlines the specificities of such IS projects and their implications for project management. As a conclusion, the paper puts forward a process model outlining how the integration of business and IT can be achieved to ensure the successful completion of selection stage of IS projects involving the purchase of mission-critical off-the-shelf packages.

Key-words: Purchasing mission-critical systems, Project management, Process model.

1. INTRODUCTION

The importance of information systems is well understood within the business world and much research has been carried out on the difficulties inherent in developing information systems to support the key areas of a business or even for competitive advantage. There is a new trend in the software market to propose off-the-shelf applications of increasing complexity. The Enterprise Resource Planning (ERP) area is one area where this is particularly evident and much research is being devoted to it (Rowe, 1999). This is a major difficulty for organisations, because, at this point in time, the process and issues associated with the selection and purchase of critical information systems are still not clear (Adam and Cahen, 1998; Marciniak and Rowe, 1998). Indeed, the literature does not adequately deal with the steps organisations should follow when buying key or strategic information system solutions in the open market. Key questions have not been addressed including: what specific steps should be followed, how to deal with potential suppliers and what critical success factors in the selection process are.

In this paper, we present a detailed account of the process of selection of a radically new, mission-critical application in Bord Gais Eireann (BGE). Section 2 presents the objectives of this research. Section 3 identifies the critical success factors of this project and section 4 reviews all the stages of the process followed up to the point where one supplier was selected and the contract was signed. We then attempt to formalise what we learnt in BGE in a process model that could be followed for the software selection phase of IS projects involving the purchase of key information systems.

2. THE OBJECTIVES OF THE STUDY

In order to learn about the process of buying complex information systems in the market place, a longitudinal case study of an organisation in the process of acquiring a mission-critical application was carried out. Bord Gais Eireann (BGE) is the semi-state body in charge of distributing natural gas in Ireland both to industrial customers and to private customers (about 300,000 households use gas central heating in Ireland). Data about the process followed up to the signature of the contract was collected extensively through a series of interviews with key actors over the entire life time of the project. There also was an element of participant observation as one of the authors of this paper was the project leader in the selection of the system. This enabled us to gather rich data about the process followed and to gain insight into the difficulties faced by the actors involved in the project. The questions we tried to answer are outlined below:

Research Question 1: ***What process did BGE follow when selecting and buying their mission-critical system?***

Research Questions 2: ***How can Project Managers ensure that the Business and IT dimensions are aligned during a system acquisition project?***

3. THE BOARD GAIS EIREANN CASE STUDY

3.1. Context of the case study

The Utility sector is undergoing major change throughout Europe as a result of deregulation and the introduction of Third Party Access[1] (TPA). At the time this research was conducted, the EU Gas Directive was being implemented in Ireland and Bord Gais Eireann (BGE) had to develop and implement a gas transportation management system to manage the day to day transactions and management information systems required to facilitate such major organisational development and change. Thus, BGE were looking for a complete solution involving hardware, software, project management, implementation, integration and customisation if an off-the-shelf package was chosen.

With the introduction of TPA, BGE is required to separate out its transmission business from its gas trading business. The two areas are 'ring fenced' and 'Chinese walls' are to be established to ensure confidentiality of information (Doyle and Adam, 1998). This has led to the establishment of the Transmission (BGE Transmission) and the Gas Trading (BGE Trading) business units. The Transmission Business Unit is responsible for the development and administration of TPA.

3.2. Setting Up the Key Aspects of the Project – The Initial Steps

The approach taken by BGE in implementing TPA was to develop, through consultation with its customers, a Code of Operations, Standard Service Contracts, Special Service Contracts and special administration arrangements for the delivery of the gas product at Entry Points. In short the documents outlined the business processes and required system functionality for the operation of the Third Party Access transportation services offered by BGE.

To aid in the development of the TPA business rules and principles the Department Managers, Project Manager and IT Project Leader from BGE met with pipeline companies in the US and the UK to study their practices in terms of how other pipeline companies operated in a similar business environment. Consultants were also employed to facilitate workshops where BGE's business processes were re-designed for TPA. The consultants had considerable experience with deregulated markets and business re-organising in such contexts.

Workshops were held in house with various business units and departments to discuss the options available to BGE. The outcome of these meetings was the development of an initial set of business rules and processes under which the TPA services would

[1] Third Party Access (TPA) is the process where third parties can utilise the networks of monopoly utilities for the purposes of providing services, in a competitive manner

be offered to BGE's customers. These were then discussed with BGE customers through a process of individual, initially, and then group consultation. The consultative process resulted in the formulation of the business rules and principles into two documents, i.e. the *Code of Operations* and the *Standard Transportation contract.*

The resulting business processes became the blue-print for the IT solution that would support the day-to-day activities of TPA including transaction processing, communications, reporting and billing/invoicing. These requirements were translated into an Invitation To Tender (ITT) to be distributed to potential vendors.

3.3. Steering Committee and Project Team

A project steering committee was set up which comprised of the CIO, the manager of the new transportation business area and an IT Project Leader. A business analyst, later appointed as project manager, joined the project's steering committee. The manager of the Transmission Business Unit, who was also a company director, took on the role of project sponsor.

The CIO and Transmission Business Unit Manager ensured that support for the project was at the highest level within the organisation as they were both members of the BGE board. This ensured that the critical issues were dealt with at the highest level. Also, there was close co-operation at all times between each of the business units and IT with respect to all aspects of the project from the creation of the project steering committee, and the project team, to the preparation of the ITT, to the Tender Shortlist, through to the evaluation of the tenders and the eventual selection of the solution provider.

As the project developed, the project team was expanded as additional resources were required. The primary methodology was that a number of core individuals served on the project either full time or part time over the life of the project and other key individuals joined and left the team as required throughout the project. The structure of the project team is outlined in Figure 1 (Project Team). The oval shapes represent the areas of responsibility with the shaded areas representing the areas of the organisation that are directly affected by the system solution. The oval boundaries are not to be taken as rigid as responsibility evolved over time, and areas of responsibility were modified as a result of delegation. The dashed and continuous lines highlight both the formal and informal communication which existed within the project team. The formal communication involved mainly documentation and meetings whereas the informal communication occurred every day through email or chance meetings in the corridor.

Regular meetings were held by the project team at key points in the project. They were conducted with the Head of Transmission, CIO, Grid Control/C&I Manager, Transportation Services Manager, IT Project Leader and Transportation Services Project Manager. As the system would primarily be used within the Grid Control business area, it was agreed that two

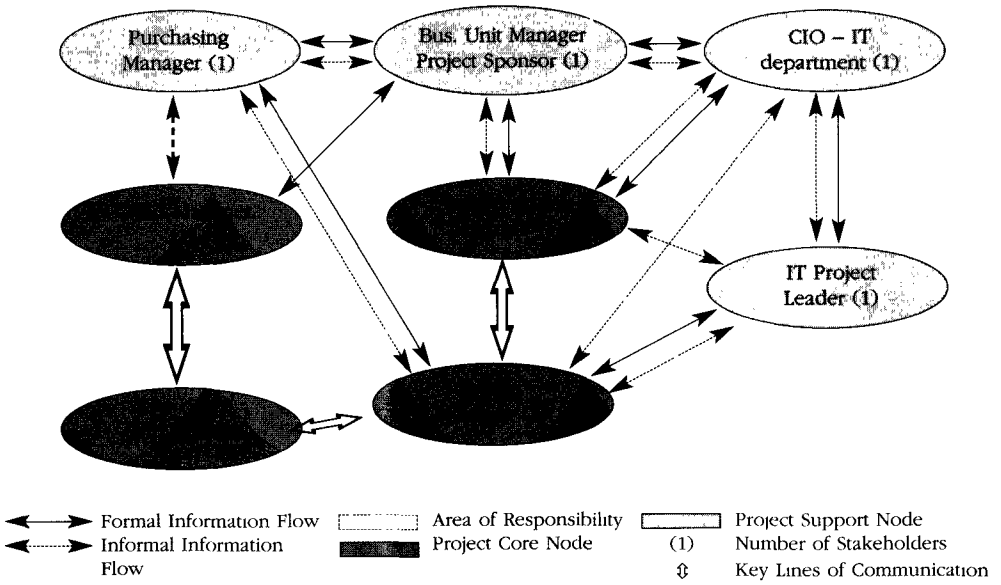

Figure 1: Project Team

key 'super users' should be appointed from the Grid Control business area. These two 'super users' became part of the core project team during system selection and implementation.

The Project Manager played a key role as the central point of contact and ensuring that all stakeholders were kept fully involved or informed, as required, during the life of the project. This 'involvement' of all of the stakeholders was seen as a key element of success or failure in the project. Meetings, discussions and presentations were undertaken by the project team at critical stages to ensure decisions were taken by the group as opposed to 'by individuals'.

3.4. Risk Management

The management of risk in the selection of a new system solution is critical. In the case of BGE, risk was primarily dealt with through the appointment of appropriate personnel at the appropriate stages of the project. In addition, a number of additional steps were taken with respect to the management of risk.

The Project Manager was involved in the process of consultation with BGE customers and the other interested parties. Therefore, when the Code of Operations was completed and the final functionality determined, the Project Team was quickly up to speed with the proposed business rules and processes. This effectively meant that the risk associated with the evolving business processes could be minimised. This is of vital importance to any company but more so in the case of BGE who were developing a new business area and had put considerable effort into the development of the business processes and rules of this new business area.

Communication turned out to be a key means of minimising risk. Communication flows, along with close working relationships, ensured that the risks associated with the development of the business rules and processes, and the formulation of the new IT strategy, were taken into account. Circulation of correspondence, reports, presentations and regular meetings ensured that all stakeholders were kept actively involved in the discussions surrounding the preparation and selection of the final solution.

As in many IS projects, there was a problem with ever changing and developing business rules. In order to manage the risk associated with such changes, the Business Unit manager ensured that the Project Manager was kept fully up to date with arising business issues through active involvement in the business area.

It was agreed between the project team members that, although time and cost were critical factors, the main priority of the project was to get 'it right' – i.e. to get the right system under the right conditions. This was an important decision in eliminating risk as it effectively meant that a 'cheap fix' solution would not be chosen over a 'high quality' solution or that the selection of the system would not be put at risk through a 'hasty' or 'pressurised' decision.

3.5. Stakeholder Involvement

One of the key elements to the selection of Information Systems is the involvement of stakeholders. Stakeholders can be both internal and external to the organisation and can be considered as those people who are affected by the selection of the system, either directly or indirectly.

The key internal stakeholders consisted of members of the Transmission Business Unit and IT. The Project Team was at the centre of the web of relationships and took responsibility for the project with the board of directors ultimately taking the final decision.

Internal Involvement – End User/IT

The Transmission Business Unit was actively involved in the project through the Project Sponsor, Project Manager, Project Leader/Business Analyst and the 'Super Users'. IT were involved through the CIO and through the IT Project Leader. After the selection of the system solution provider, IT would also be involved in implementation and training, and would provide long term support and training.

This cross sectional involvement ran through the project from its initiation to the final evaluation and eventual selection meetings. Other internal users included the operational and financial staff in the related business areas. These members of staff were involved through additional workshops and meetings were held on a regular basis and focused on the direct requirements of each of the particular departments. The selected vendor was also instructed in the ITT to provide training courses to these internal stakeholders prior to the implementation of the system solution.

External Customer Involvement

Consultation with customers and the public is essential to projects which concern semi-state companies involved in the delivery of services to the public. BGE's customers had a significant interest in the development of the new business rules and of the new system. Therefore, BGE considered it important that these customers would be brought on board in the selection process.

One of the customers involved by BGE in the process was TILES LTD.[2], who were operating under an existing long term contract. This ensured that an existing customer's considerations would be fully considered in the selection and development of the system. After some initial discussions between the two companies it was decided that specific system project meetings would be held between the BGE, and TILES LTD project teams and that the electronic interchange of electronic data between the two company systems was a key requirement.

In addition, on-going consultation took place between BGE and the wider energy community consisting of existing customers, future customers, government bodies and business groups. Presentations were made by the project manager in a series of group consultation meetings. Thus, BGE undertook workshops with its customers outlining what 'a customer' would be required to do on a day-to-day basis when TPA is implemented.

4. THE SELECTION PROCESS

4.1. Mapping the Business Processes

BGE decided to hire consultants to map the new business processes with the intention that the business process maps would be converted into a set of System Requirements. They were of the opinion that the consultants employed would also complement the formulation of the business processes which had emerged as a result of 'in-house' workshops and consultation with current and prospective customers and other interested bodies. The consultants should be experienced in the area of TPA so that they could assess the business rules for completeness and further aid in the development of the functional requirements.

On analysing the documentation and correspondence, members of the project team were led to question the value of the consultants' contribution. They felt that a large amount of documentation had to be written by the business analyst on top of the work produced by the consultants. The Business Analyst's comments were largely included directly into the subsequent drafts of both the business process maps and IT system requirements.

BGE had gone to great lengths to select the most suitable consultants available, but this was a new business area with limited numbers of experienced people available to perform the function of business process mapping.

[2] 'TILES LTD ' is a fictitious name for an existing customer of BGE's

When the Business Process maps and the initial IS System Requirements document were completed, BGE conducted an investigation into a number of 'packages' and consultant solution providers. BGE also decided to speak to their clients along with a number of companies in the same business area who had developed their own 'in-house' systems.

4.2. Search for Suitable Solution Providers through Site Investigations

The solution providers chosen for the investigation were sourced and researched through industry contacts, seminars and the Internet. They consisted of a mix between suppliers of 'off-the-shelf' package solutions; consultant solution providers and custom built solution providers from established software development companies. All of these solution providers had developed and implemented software solutions relevant to the TPA project.

The primary issues discussed with the prospective solution providers and their clients included support, project teams, experience of staff, gap analysis, requirements definition, package functionality fit, implementation approaches, customisation, system upgrades, source code, logistics, European partnerships, development methodologies and software licences. Other technical aspects discussed included Internet technologies and potential future developments.

Table 1 includes a brief description of each of the site visits including location, time spent and content of the site visit.

4.3. The Invitation To Tender (ITT)

A business case was prepared by the Transmission Business Unit with all the project stakeholders within this unit being involved in its formulation. The draft business case was circulated to the core project team, project sponsor and key internal end users of the system. Comments were received from the project team and the business case was updated accordingly. Following approval by the Project Sponsor and the business area manager, the business case was then circulated to the CIO to enable an investment prioritisation decision to be taken on the new system.

The initial draft of the document was circulated to all members of the project team and to each of the departments affected by the tendering process and the new system. Stakeholders focused specifically on the areas directly related to their own activities which allowed the document to be turned around quicker. To highlight the fact that the system requirements had changed between the initial mapping of the business processes and the preparation of the first draft of the ITT, the changes resulting from the process were listed. This listing proved valuable at a later stage as it focussed management's attention on the changes that had been requested. Test cases, specific worked examples of the application functionality, were developed by the Project Leader and were also circulated to the project team. On the basis of

Site ID	Site Type	Duration of Visit	End User Involved	Form of Site Visit
Altra Technologies, USA	Package Solution Provider	1 day	No	- Sales presentation - Technical demonstration of the product available - Meeting with technical development staff - Simulation of training centre
TransEnergy, USA	Package Solution Provider	2 days	Yes	- Day 1 (spent at TransEnergy HQ) consisted of; Sales Presentation, Technical Demonstration of the product, Technical discussion on functional requirements - Day 2 spent with 2 of TransEnergy's customers, Shell and PG & E.
Proxicom, USA	Consultant Solution Provider/ End User	1 day	Yes	- Sales Presentation - Meeting with PG&E, a client of Proxicom for whom they had developed a system solution - Discussion about business rules, technologies employed, methodologies employed, experiences and lessons learned
EDS/IUK, UK	Consultant Solution Provider/ End User	1 day	Yes Yes	- Meeting with IUK, a client of EDS for whom they had developed a system solution - Same discussions as above
TransCanada, Canada	In-house Development/ End User	2 days	Yes	- Meeting with both business unit and IT - Same discussions as above
Questar, USA	End User	2 days	Yes	- End User of the Altra System - Same discussions as above

Table 1: Summary of the Site Investigations

the comments received, a second draft of the ITT was prepared, which, once circulated, gave rise to more comments.

Key points which were considered in relation to formulation of the ITT were; (1) to write the ITT so as to place the risk on the solution provider, (2) to seek a 'total' solution including software, hardware, project management, integration and configuration, and (3) to include the ITT and negotiated changes, i.e. the final tender, in the final contract. These three points are essential in ensuring that the selected vendor takes the responsibility of delivering the solution and not just the 'glory' of winning the contract.

4.4. The Evaluation Matrix – Initial Vendor ShortListing

Prior to the completion of the vendor shortlist, BGE were familiar with a number of suitable candidates for the provision of the system. However in line with EU purchasing regulations, an advertisement was placed in the January '99 edition of the EU Journal. The advertisement requested parties

who were interested in tendering for an Integrated Gas Transportation Management System to respond to BGE and register their interest. Eighteen parties responded to this advert and BGE wrote back to them requesting further information about their company size, number of employees, profit etc. The Request for Information (RFI) also asked them to include information about their experience on the development of gas transportation management systems. Nine parties responded and they were combined with the possible candidates already known to BGE. Candidates who did not respond to the RFI were excluded from the process. In fact, when asked to provide information on their relevant experience, through the RFI, a number of candidates withdrew voluntarily. This highlights the usefulness of the RFI letter, firstly to obtain further information on prospective vendors and secondly to 'weed' out unsuitable candidates without further assessment. The remaining candidates were included in the evaluation matrix showed in Table 2.

The preliminary industry research proved invaluable to BGE as it emerged that a number of suitable candidates, whom they had discovered through their own research, were unfamiliar with the EU Journal and did not respond to the EU advert. However the EU Journal ad also proved its value by identifying at least one other suitable candidate who would not otherwise have been known to BGE. At the end of the process, eight 'Suitable' candidates emerged from the process and the ITT was issued to them.

Category	Criteria Description	Suitability
1	Companies which have previously developed system solutions in the relevant business area and/or who had a strategic alliance with a suitable solution provider in the relevant business area. These companies supply system solutions and are based in Europe. Experience in specific technologies is also considered an advantage and logistics with reference to long term issues such as support and customisation is also considered.	Suitable
2	Candidates who have experience in the relevant business area, via consultancy, and have developed systems in a related business area but not in the business area specifically applicable to the companies needs. It was considered that there was considerable synergy with these companies but no direct experience for the type of solution required.	Unsuitable
2A	Companies who have developed system solutions but have no experience in the relevant business area or related business areas.	Unsuitable
3	Companies who did not respond to the request for information and responded to the EU Journal are not included in the above listing.	Not in above listing

Table 2: Evaluation Criteria for Suitable Solution Providers

4.5. Collection of information on vendors

Information on possible vendors was assembled from a number of sources including company literature, interviews, the Internet, phone calls, industry contacts and vendor reference sites. The information was assembled and analysed during the process of preparing the tender shortlist. Interviews were also conducted with possible vendors. They proved useful as BGE were able to target specific areas of interest in the assessment of the suitability of the various candidates. There were a number of instances where candidates claimed to have experience in certain areas but when questioned to confirm such experience in writing were unable to do so.

The discussions with the clients of these vendors and requests for written information were also useful in deciphering myth from reality. The clarifications often highlighted the vagary of sales tactics which can be used by marketing personnel and the gulf which can often appear between marketing and the reality of engineering. In the words of the project manager 'Marketing may sell you the sun but the engineer will take you to the moon'. As information was collected and candidates were questioned about their particular experience it became a lot clearer who was suitable and who was not for the purpose of sending the ITT.

4.6. Pre-bid Meeting

A pre-bid meeting was held two weeks after the issue of the ITT and four weeks prior to the deadline for receipt of bids from interested parties. Four of the eight parties who had been issued with the tender document were present at the meeting.

The purpose of the meeting was for BGE to clarify any queries which the tenders may have and to document them for inclusion in the ITT. The CIO chaired the meeting with the questions being directed to the relevant parties. Questions/clarifications were sought with respect to;

1. The process of selection, i.e. procedure, timescales,
2. The required solution in terms of functionality, technologies applied,
3. Availability of the required solution,
4. Business process change and future growth path,
5. Alternatives to existing processes/business functionality,
6. Conference room pilots/prototyping,
7. Terms and Conditions of Contract,
8. Project Teams/Project Structure.

It was generally felt by the BGE project team that the discussion during the pre-bid meeting was quite limited and that the tendering process did not benefit as much as it should. However, the tenderers obviously approached the meeting with care and were aware of the competition in the room.

4.7. Tender Evaluation

The criteria under which tenders were evaluated is outlined in Table 3. The lis-

ting was not in order of priority and was described as 'headings under which BGE will evaluate the responses to the ITT'. The headings were weighted *prior* to the bids being received. In the weighting of the selection criteria each of the listed items were grouped under seven headings which included extent of compliance, experience of tenderer, experience of project team, approach to proposal, support, commercial and joint venture relations/future relations.

The weighting of the selection criteria was such that extent of compliance, experience of tenderer and commercial terms accounted for 75% of the evaluation weighting. This was consistent with the position adopted by the project steering committee, that the focus of the project was to get the right system solution under the right commercial conditions.

Four responses were received by BGE. Two of the responses were in the form of alliances between consultant solution providers and vendors. The third response was in the form of an existing bespoke solution which could either be accepted as is, i.e. BGE would be required to change their business processes to mirror the existing functionality of the current system, or be customised at a cost. The fourth solution offered consisted of a customised solution based on the use of a development kernel.

Evaluation Heading	Evaluation Criteria	Clarifications Raised
Part I Extent of Compliance (Risk)	Functionality/Usability (Clarification Meetings/Conference Room Pilot) (Quality of the Proposed Solution)	The extent of compliance offered with respect to aspects of functionality The extent of compliance with respect to implementation requirements Does the proposed solution include hardware and integration support What level of testing is offered in the proposed solution What assumptions are made by each candidate The sequencing of events with respect to the project plan Specific items provided for in the project plan
Part II Experience of Tenderer (Risk)	Confidence that system has been designed by people who know and understand the TPA environment, i.e. tenderers' experience of gas transportation management systems	The candidates' experience in the European gas industry The candidates' experience in the regulated pipeline gas industry
	Vendor Information Requirements	Client reference sites Future R&D spending
Part III – Experience of Project Team	Experience of Staff proposed for the development and implementation of the assignment	Continuity of staff with respect to the clarification meeting/conference room pilots and the implementation team
Part IV Approach to Proposal	Duration of project Possible start dates	Confirmation that the project will be completed by the required date even with the inclusions of items which may not have been in the original proposal
Part V Support	Implementation Support (Hardware/Software Solution)	What level of on site support will be provided during implementation Did the Project Management offered cover both the implementation and configuration of software and hardware
	Long Term Support	What type of long term support is provided in the maintenance cover, i.e. is 24hr support included
	Ease of Maintenance Re – testing Effort Required on Upgrades	What are the implications of core product upgrades What level of testing is required in the event of an upgrade to the core product
Part VI Commercial (Risk)	Commercial terms Total Cost Of Ownership over 5 Years Upgrades of Product/Customised Software Provision of Total Hardware/Software Solution	Is the price provided a 'Fixed and Firm' Price What assumptions are made in the pricing What are the cost implications of upgrades to the core product What is the breakdown in costs for specific items of customised software with respect to functionality, interfaces, web development, etc. Is there a cost for the CRP in the event of a candidate being unsuccessful
Part VII Joint Venture Relationship/Future Relations	Growth path (e.g. flexibility to accommodate any new service/method of working BGE are contemplating)	How will the solution be adapted to meet new services offered by BGE in the future Could the solution be adapted to meet new methods of working by BGE in the future, i.e. a reduction in the TPA Threshold

Table 3: Evaluation Criteria and Tender Clarifications Sought

The initial tender evaluations covered a wide variety of areas and raised a number of issues which required clarifications to be sought. Table 3 summarises the clarifications sought from the tenderers by the BGE project team in relation to each of the criteria.

During the initial evaluation of the tenders it emerged that one of the companies involved in the bidding process took over the partner of one of the other bidders. This led to the elimination of one of the candidates and left BGE with three possible solutions to pick from.

4.8. Shortlisting of Tenders

The tender evaluation report strove to clearly compare each of the three remaining candidates. The assessment was based on the evaluation criteria outlined in the ITT. One of the primary areas in assessing each of the proposals was 'Extent of Compliance to System Requirements', which included the functional requirements, the IT Technical Requirements, On-Going Requirements, Testing/Validation, Data, Interfaces, Implementation Methodology, Year 2000 compliance and Euro compliance. The Functional Requirements described the requirements of the gas transportation management system.

Suppliers were asked to indicate the extent to which each requirement was supported in their systems using the convention: **C** – requirement completely supported, **P** – requirement partially supported and **N** – requirement not supported. This convention was subsequently used to analyse the functional requirements of each of the proposals.

The Tender Evaluation and Summary document was circulated to the entire Project Team and the members of the Steering Committee. A meeting was arranged to score each of the proposals and compile the tender shortlist. The meeting was attended by the Project Manager, the IT Project Leader, the Super Users and the Departmental Managers. Each of the three remaining candidates were scored on the basis of their original tender submission and the subsequent clarifications received. Two candidates emerged as being front runners and their total scores were within 5% of one another. The tender score sheet and final scores were agreed and signed by all those present at the meeting. The completed score sheet was circulated to all members of the project team and to all members of the Project Steering Committee, Purchasing and the Project Sponsor.

Both candidates were shortlisted, but two key issues remained. One of the candidates provided a very good solution but the commercial terms were quite unsatisfactory and well in excess of the Project budget. The commercial terms of the second candidate were within the project budget but little was known about their actual technical capabilities. It was decided that these two key areas, along with all other aspects of both proposals would be further clarified through meetings, site visits and conference room pilots.

4.9. Site Visits of Shortlisted Candidates

During the site visits, it was decided to focus on the remaining key areas of concern. The primary concern with

ABC Software[3] was the commercial terms and it was decided that the most appropriate parties for this site visit were the Manager of the Transportation business unit and the Purchasing Manager. The agenda for the site visit included: software functionality, project approach, implementation, project management, Client/Vendor Relationship, product customisation, and bottom line costs.

After this visit, ABC Software agreed to review its pricing. Effectively, they recognised that their pricing may not have reflected the true nature of BGE's requirements and requested to hold off on the cost of their proposed solution until after the conference room pilot.

The primary concern with DEF Software[4] revolved around their technical ability to deliver the solution. Therefore it was decided that the most appropriate parties for the second site visit would be the Project Manager, the IT Project Leader and the two project Super Users. The Technical Site visit would focus on: the history, experience and technical abilities of the candidate, presentation and technical discussion on the core product, business processes, technical architecture and project approach. A demonstration of a previous implementation similar to that of BGE requirements was also sought.

This site visit proved very useful in that it exposed the Project Team to the technical capabilities of the candidate. They felt more confident that the tenderer could provide the required solution. Therefore a Conference Room Pilot was organised with the focus primarily residing on the candidates' understanding of the business requirements and their ability to deliver a suitable solution.

4.10. The Conference Room Pilots (CRP)

At this stage in the selection process, BGE were confident that it could proceed with both candidates for the purposes of the preparation and conducting of the Conference Room Pilots. It was agreed that the CRPs would last for four to five days and would involve the tenderers demonstrating both the business fit of the proposed solutions, their knowledge of the industry, technical configuration and project management/implementation issues. The team for the CRP consisted of the Project Manager, the IT Project Leader and the two super users.

On completion of the CRP the tenderers were requested to make final submissions with regard to compliance to functionality and commercial details. The BGE CRP team performed a review of the CRP and conducted a preliminary scoring exercise of each of the candidates. A CRP Summary and Assessment report was completed and circulated to all members of the project team prior to final scoring of the tenders.

[3] Not the company's real name

[4] Not the company's real name

It should be noted that prior to the CRPs, BGE entered into a mutual binding confidentiality agreement with both candidates. These confidentiality agreements would stand for the remaining lifetime of the project.

4.11. Returning a Verdict

A meeting was held between the team involved in the CRP and the business unit managers to review the conference room pilots, to discuss and analyse the final submissions from both parties and to score the two shortlisted tenders. The criteria used for scoring and selecting the winner remained the same as that outlined in the ITT and used in the shortlisting scoring exercise (see Table 3). However, the evaluation headings were further detailed to highlight the risk element associated with a number of the evaluation criteria.

On completion of the scoring, one of the candidates emerged as a clear winner and the decision to award them the contract was taken unanimously by the project team and the business unit managers. There were a number of minor outstanding issues for which the Project Manager was asked to seek clarification, but these issues did not affect the scoring. The decision was then presented to the Project Steering Committee and the BGE Board for approval. Following board approval a letter of intent was issued to the successful candidate and a contract for the supply of the system solution subsequently negotiated.

5. SUMMARY OF THE SELECTION PROCESS

The steps in this rather complex selection process are outlined in Figure 2. The diagram outlines the key steps in the selection process from the preparation of the business process maps to the selection of the supplier. The timeframe of the key stages in the project is highlighted on the left of the selection processes. Even though the first set of business process maps were completed in October '98 it was May '99 before the ITT was issued. This was as a result of the continued process of consultation with customers and the public.

The case study points to a number of key conclusions which are presented in the next section.

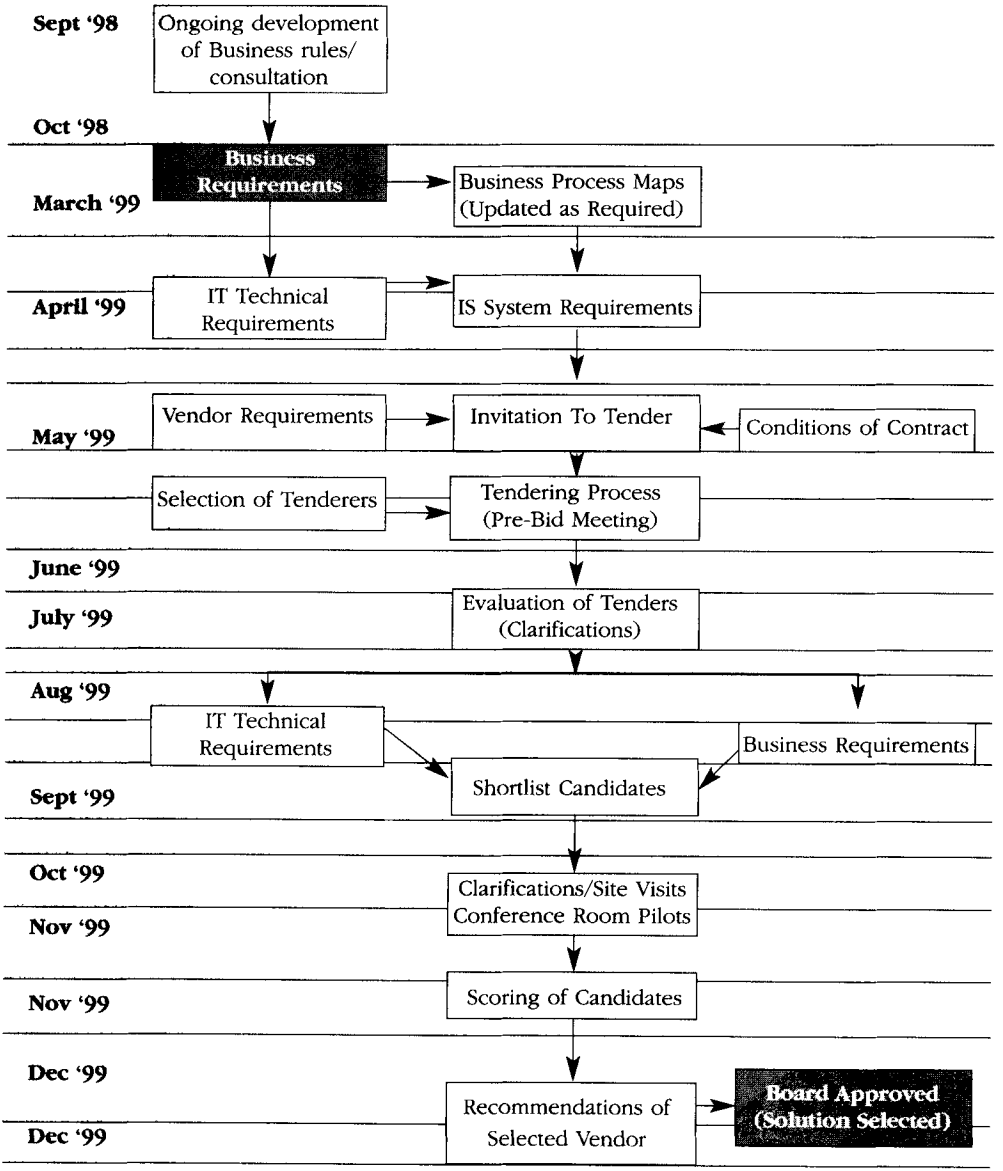

Figure 2: The Selection Process

6. REVIEWING THE FINDINGS AND CONCLUSIONS

The following section puts forward the most important lessons that can be learnt by practitioners and researchers from the case data reported in this paper. It focuses on two significant areas that emerged from the case: (1) the process that was followed in buying the mission critical system and (2) the necessity to align information systems with the business strategy of the firm.

6.1. What process do firms follow when selecting suppliers of mission-critical systems?

Sources of the requirement for new systems

The primary concern of organisations seeking to buy off-the-shelf packages should be to identify the source of the changes driving the requirement for new systems. In BGE, the requirement for change came from the EU Gas Directive which stated that gas pipeline companies within the EU had to open up their networks for competition by February 2000. BGE required a new system with regard to Third Party Access (TPA). Because BGE had defined rules and had started implementing TPA via a set of manual procedures and spreadsheets, a 'package' solution would only be of use to BGE if it could match the functionality of the business processes already agreed upon. If the functionality of the package could not match these processes then extensive customisation would be required.

We are aware of the case of another utility company in Europe where the process followed was reversed. Faced with very tight deadlines, the project leaders decided to rapidly acquire a system that matched the overall requirements and to use this system as a training tool for the organisation. In this case, speed was the key concern and the specific analysis of requirements never took place. The managers committed to a particular system and hoped that it would fully accommodate all their needs. These two contrasting examples illustrate that the requirements for IS solutions are determined not only by the business processes to be supported, but also by the timeframe and other constraints under which new systems must be delivered and by the business context surrounding the project.

The process of selecting information system

The selection process undertaken by BGE went through many key phases and steps. Its primary feature is that it was complex, relatively slow and involved many recurrences of the same issues. This process of solution selection deserves the full attention of project leaders in a way that is fundamentally different from what happens in traditional development projects.

In BGE, the process of solution selection involved the following key steps:

- a project steering committee was established,
- teams with a variable mix of business and IT competencies were set up,

- solution providers were researched extensively and shortlisted,
- candidates were tendered,
- conference room pilots were used to test the strengths and weaknesses of the tenderers,
- the most appropriate solution provider was selected based on a set of strict selection criteria which were used consistently throughout the entire process.

It is interesting to note that both BGE and the other utility company mentioned above conducted conference room pilots with the same candidates but as a result of their different requirements, selected different suppliers. Both organisations followed similar processes, but the other utility company required a packaged type product whereas BGE required a 'kernel' type product on which specific business rules could be applied.

There is a key element of risk in the selection of any system solution, however it is critical to manage the risk such that it is minimised for both the solution provider and the client organisation. In the case of BGE, the solution providers tried to transfer all the risk on to BGE by being unclear and unambiguous in their responses to the ITT. The ITT asked for a 'Firm and Fixed' price yet only one of the four responses included such a 'Firm and Fixed' pricing arrangement. Also, the tenderers stated that they had made a number of assumptions in their responses without clearly outlining what these assumptions were. Responses were often qualified with 'subject to'. It is the project team's responsibility to minimise the level of risk associated with the selection of the system by exploring all areas where uncertainty remains and highlighting at the appropriate hierarchical level.

The evaluation criteria used in the shortlisting and selection of candidates

When shortlisting the candidates, BGE established evaluation criteria based on their business and IT Strategies. The evaluation criteria and their relative weight were set out prior to receipt of any of the tender documents and were agreed between the business unit and IT. These criteria were coded in an evaluation matrix including a summary of each candidate's strengths and weaknesses based on the literature provided and on BGE's own research. Based on the matrix, each candidate was given a 'rating'. The assessment criteria for each of the categories was used to determine whether candidates were 'suitable' or 'unsuitable'.

The tightness of the evaluation criteria is a critical factor. If the evaluation criteria are too tight, too few candidates (or even none) will be deemed suitable. This may lead to a considerable waste of resources. On the reverse, if the evaluation criteria are too loose, too many candidates may be shortlisted. Therefore the project team must be prepared to modify the evaluation criteria so that it allows an appropriate number of candidates to be selected.

A strict balance must also be achieved in the weighting which applies to

the different criteria. Obviously, the weighting determines how a candidate's weaknesses can be compensated by its strengths. Thus, a cheap proposal can rate higher than a more complete but more expensive one. In the case of BGE, it was decided from the outset that the commercial aspects of the project would have a capped weighting so that cheap solutions which only met some of the requirements would not come out on top when they clearly did not provide a sufficient match to the requirements of the firm. Thus, it is well worth it for project managers to spend time in setting up their evaluation criteria and in deciding how they will be applied.

The right solution provider

This study also illustrated that, when buying off-the-shelf systems, the quality of the system ultimately acquired is fundamentally determined by the solution provider. Thus, finding the right solution provider is as important as getting the analysis of the requirements right. BGE undertook significant research into the possible solution providers available. Different solution providers provided different types of systems including packaged solutions, bespoke system solutions and kernel solutions and BGE were in a better position to select a solution provider who could meet the business requirements within the IT Strategy of the organisation. Thus, it is well worth it for firms seeking to buy mission-critical systems to spend time finding many potential solution providers.

6.2. How are the Business and IT dimensions aligned to meet the objectives of the project?

Aligning the Business and IT strategy

Within a traditional organisation, the business expertise resides within the business area and the IT expertise resides within IT. In order for the business to be supported effectively by IT, information systems must closely meet the business requirements. The BGE case shows that there should always be a close, on-going relationship between IT and the Business Units.

In BGE, the project team was comprised of a combination of business and IT personnel with the Project Manager coming from the Business Unit. The conference room pilots and the selection process were conducted by a mixture of both business and IT personnel. IT played primarily a support role with the business actors taking a lead role in the selection of the system. This close working relationship was maintained during the whole selection process.

An Integrated Project Team

As outlined in Figure 1, the project team consisted of a Project Sponsor, a Project Manager, a number of key managers and a number of key users from the various departments along with key personnel from IT and Purchasing. This mix of competencies was essential in ensuring that the views of all stakeholders were represented. Not only were each of the various disci-

plines represented on the project team, but stakeholders' involvement in the project was at the appropriate level. BGE established a project steering committee which consisted of the CIO, the business manager with responsibility for the project, a project manager from the business side of the organisation and an IT Project Leader.

This method worked well and the solution selected was supported at all levels, from the users right up through the Project Manager to the CIO and Business Unit manager. As a result of the Project Management structure all stakeholders were allowed to make a contribution, be involved in the resolution of conflicts and have concerns aired in the appropriate forum.

Good communication between project stakeholders

Good communication is not only important within the project team. Regular meetings and workshops were also held with external users of the system and with members of the Project Steering Committee. The Project Manager was responsible for the co-ordination and circulation of documentation within the project team and the relevant business unit managers.

Thus good communication, through documentation, email, memos or meetings, is essential to ensure all stakeholders are properly informed throughout the decision making process. Good communication ensures that there are no misunderstandings or misinterpretations of what the solutions' requirements are, of what the tenderers are proposing and what process of selection is being followed. It is the only way to ensure that all the project team sign into the selection of the eventual winner and that there is no surprise for anyone.

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