A UK Government IS Project: Inherent Cultural Issues of a Bureaucratic Environment Impacting upon a RAD-type Development

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Abstract

A large and complex Information System development project adopting an RAD style development approach is currently being implemented within UK Regional Government. It is considered to be unique within the UK because traditionally government projects adopt a more formal and structured approach to system development such as SSADM (Structured System Analysis and Design Method). Through a case study approach, the paper informs on two major impacts of organisational culture that were experienced in applying such an agile development approach within a structured and hierarchical driven environment. More specifically it discusses the cultural implications associated with requirements elicitation and decision-making that had a significant affect upon the development approach. In conclusion it presents preliminary analysis that enables the researcher to suggest some critical success factors that could be applied within similar development arenas.

Keywords: RAD, Culture, Requirements Elicitation, Decision-making.

1. INTRODUCTION

This case study concerns a large, complex information system (IS) development project adopting a RAD-type approach that is currently being implemented within UK Regional Government. It is considered to be unique within the UK because traditionally government projects adopt a more linear and structured approach to system development such as SSADM (Structured System Analysis and Design Method). History has shown how the more traditional structured methods of development such as the ‘Waterfall Model’, are no longer effective for the increasingly volatile, and dynamic nature of current business environments. Consequently approaches to development, such as RAD (Rapid Application Development) have evolved to overcome these intrinsic weaknesses. This paper discusses how the bureaucratic nature of the organisation impacted upon the development process in the context of the real life occurrences of the case study. It focuses on requirements elicitation and decision-making as these were identified as the key issues.

2. RESEARCH RATIONALE

RAD, first formalised by James Martin (1991), originated during the early 1990s from rapid prototyping approaches. It evolved out of the commercial need for faster systems development than traditional methodologies such as the ‘Waterfall Method’ could deliver. The nascent status of RAD as a development approach and its commercial emphasis has resulted in individual philosophies and perceptions of its rationale and applicability. Consequently RADs development was driven by the IT industry and as such it has had little influence from the academic world. Even though RAD is becoming an increasingly accepted approach to IS development, much of the existing literature tends to focus on small to medium size projects that does little to clarify the position, and continues to question its
suitability across large, complex development projects (Beynon-Davies et al. 1996, Boehm 1999, Howard 2002). The tenet is that RAD is not suitable for all types of project, that it is generally associated with small/medium projects with low levels of complexity (DSDM 1994, Beynon-Davies 1999, 2000). For example, Beynon-Davies et al. (1999, 2000) report on 7 small/medium studies of RAD development projects, and Jones and King (1998) on 2 RAD implementations compared to extensive coverage by practitioners reporting on small/medium commercial projects that are too numerous to detail.

Moreover literature puts forward the view that bureaucratic environments are particularly unsuitable because the inherent formality of their hierarchical procedures hinders the speed of the RAD development process. Martin states “Bureaucracy is the enemy of speed” (1991 p128). Hierarchical cultures inhibit empowered decision-making because it may be unfamiliar and therefore difficult to achieve, but it is essential for a RAD-type approach (Martin 1991, Carnell 2003, Morgan 1997). However, there is no similar body of literature or knowledge regarding RAD’s application across larger, more complex development environments, and particularly the lack of reporting, and case study analysis of the cultural issues that influence and impact upon the RAD-type development approach. Hence this case study will address the identified gap within the IS domain literature.

3. RAPID APPLICATION DEVELOPMENT

RAD is an iterative and incremental development approach that compresses the analysis, design, build and test phases of a project into short, iterative development cycles. It is these cycles that are able to accommodate the growing uncertainty and increasingly volatile nature of current development environments. System requirements were gathered through Joint Application Development (JAD) workshops where small diverse teams of developers, key users and other stakeholders work together within tight timescales to prioritise business needs so that delivery deadlines are met (Martin 1991, Beynon-Davies et al. 1996, 2000).

In 1994 the DSDM (Dynamic Systems Development Method) Consortium was formed to develop and promote a public domain method. They established 9 fundamental principles that they considered constitutes a RAD approach (see Table 1 below.) The aim was to provide a framework that combined the best elements of existing methods with the practical experience of RAD developers. RAD provides flexibility within the development arena that is receptive to change, employs user-driven requirements gathering activities, and necessitates fast and authoritative decision-making within a collaborative development arena. The DSDM principles were aligned against the case study to certify that a RAD-type approach was being applied (see Table 1, Section 5).

Views expressed in the literature posit that factors associated with culture are key to the success or failure of this genre of development approach within large and complex arenas. Protagonists within the IS field discuss culture in terms of inherent organisational cultural constraints, the management of people within their organisational settings, and the human elements of behaviour and attitude. For example, Martin (1991) states that cultural factors must be prepared for, and puts forward organisational structure, business policies and procedures as areas of change and risk. McConnell (1996) exposes cultural and managerial changes as two of the greatest barriers to adopting a RAD-type approach. Furthermore risks associated with organisational change are also people oriented, i.e. lack of motivation, there is a need for users to create new mindsets, new behavioural attitudes and work patterns. A recent study by Beynon-Davies et al. (1999) supports this view.

4. RESEARCH METHODOLOGY
This case study research adopts a qualitative data gathering method using an interpretive stance together with an ethnographic approach. The approach chosen is aimed at producing an understanding of both the context of the IS being developed, and the process in which the IS influences and is influenced by its context (Walsham 1997, Gill and Johnson 1991). By this the researcher refers to a broad view of the organisational environment of the IS, and the wider external context within which the information system is related. The suitability of this approach is reflected in the argument that the social world cannot be understood as simple causal relationships or assumptions of universal laws because people’s experiences are based upon or influenced by social meanings (Loftland and Loftland 1984, Strauss and Corbin 1990). Thus a more complete understanding of the nature of the problem is achieved than a statistical analysis would allow. The intent of interpretative research is not to generalise but to understand the deeper structure of a phenomenon such that it can be used to inform other similar settings (Orlikowski and Baroudi 1991). There are many instances of this research style being adopted for IS research (Beynon-Davies 2000, Myers 1999, and Walsham 1997).

Ethnography was selected as a style of interpretative qualitative research within the IS development project arena. The key characteristic of observer participation was complemented with indirect observation, informal and formal semi-structured interviews, shadowing of key informants and spontaneous conversations. Secondary research reflected an in-depth analysis of existing literature from both academic and practitioner perspectives, plus an examination of existing project documents, discourse and artefacts. Analysis was driven by the data rather than the researcher and concerned ‘open coding’ where data are analysed and categorised into themes, and then further examined through axial coding to establish interrelationships, and uncover how the relationships are associated and linked.

5. CASE STUDY INTRODUCTION

The case study concerns the development of a new IT system responsible for managing the expenditure of EU grants and subsidies to customers through a number of Common Agricultural Policy (CAP) schemes across the UK region. Previously, the CAP scheme administration was organised into separate departments that dealt with specific schemes individually. These were the responsibility of teams attending to their individual business needs and administration. The new IT system moved away from the former individual scheme administration processing towards a Generic Process (see Figure 1.) that integrated the core processes of the common activities across the separate schemes.

![Figure 1. New System Generic Process](image)

The CAP agricultural policy schemes are frequently changed with new schemes being drafted as required. Each scheme must conform to it’s relevant EU legislation and regulations, however the schemes do not exist independently of each other, but acquiesce to a complex ‘network’ of interdependent relationships. The DSDM’s 9 principles (see Table 1 below) were aligned to the case study to verify that a RAD approach had been applied.

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1 EU - The European Union was formerly known as European Economic Community (EEC or EC) The primary aim is to promote the economic integration of a united Europe.
The 9 Principles of the DSDM Consortium

<table>
<thead>
<tr>
<th>Principle</th>
<th>Applied</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>1. Active user involvement</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>2. Teams empowered to make decisions</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>3. Frequent delivery of products</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>4. Fitness for business purpose</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>5. Iterative and incremental delivery</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>6. Changes are reversible</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>7. High-level requirements – baselined</td>
<td>✓</td>
<td></td>
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<tr>
<td>8. Integrated testing during lifecycle</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>9. Stakeholders collaboration and Co-operation</td>
<td>X</td>
<td></td>
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**Table 1. Alignment of DSDM 9 Principals against the Case Study.**

There is evidence of 7 DSDM principles being applied, the 9th principle, stakeholder cooperation, proved problematic in terms of the EC as external stakeholders. However, this is not the subject of this paper. Principle 7 was problematic and is discussed in this paper.

6. **CULTURAL ISSUES and THE PROCESS DEVELOPMENT**

This section focuses on identifying the inherent cultural issues related to the bureaucratic environment that impacted on the RAD-type development approach. Literature suggests that many RAD projects fail because they do not achieve the required shifts in organisational attitudes, structures, and peoples’ mindsets (Hirschberg 1998, McConnell 1996).

The culture of the Department can be characterised as bureaucratic. It is hierarchy driven, highly procedural and risk averse, operating within a regulated, and control oriented environment. Evidence confirms there are clear lines of responsibility and authority; work is highly organised, compartmentalised and systematic (Weber 1946, Wallach 1983, Hofstede 2003, Carnell 2003). Bureaucratic cultures are associated with centralised decision-making that is culturally rooted because it is the cultural time horizons inherent in an organisation that determine the speed of the decision-making processes. The case study project was affected by people’s attitudes and behaviour i.e. their inability, and reluctance to make fast, authoritative decisions. However Martin (1991) believes that these types of problems are inevitable, he states “Bureaucracy is the enemy of speed” (1991, p128). The argument is that RAD calls for different cultural characteristics than those associated with more traditional bureaucratic environments. RAD necessitates collaborative working cultures rather than the independent, discrete customs of a bureaucracy. Previous research confirms the importance of recognising that cultural issues are central to the RAD development approach (Jones and King 1998).

7. **REQUIREMENTS ELICITATION**

Traditionally requirements elicitation is closely linked to user expectation. Within the context of the case study however this connection is less manifest. Evidence links requirements elicitation and decision-making because both these activities were the primary the concern of Business Managers, the indirect users, rather than the actual end users. Thus the Business Managers who participated in the JAD\(^2\) workshops were also the key business decision makers. This section focuses on issues related to organisational culture that had major impacts upon the case study. It discusses problems arising from the requirements gathering activities and difficulties experienced in voicing business needs that impacted upon the RAD-type development approach.

\(^2\) Joint Application Development - workshops involving interactive collaboration between key business users and systems developers to analyse the goals, constraints and business needs of the new system
Requirements elicitation activities were subject to immense tension during the initial development stages. Analysis of case materials shows significant critique is attached to the efficacy of the JAD sessions. When first questioned, in every instance, both the outsourced developers and the organisational people referred to them as ‘difficult’. For example a key user commented “JAD workshops … I don’t think that it has been as successful as it could have been.” Culturally the former working patterns of the organisational people consisted of small discrete, but independent teams. The move towards the new integrated team-working environment of a RAD-type approach meant that people experienced uneasiness in the team workshops. People found it difficult to present their ‘thinking’ in front of their colleagues and this was a key concern for the developers, one developer commented “There’s definitely an attitude of not wanting to criticise your boss … so there wasn’t that openness of being able to comment or speak your mind.” The cultural issue here is that organisational people felt they were answerable to their line manager; consequently they were apprehensive about expressing their views. Several of those interviewed on the organisational side were reluctant to voice opinions in workshops if their managers were also present, they did not feel on an equal plane, and therefore did not contribute effectively. A developer commented “The culture in Government and also the Department is the seniority in the room … where only one person speaks and they happen to be the most senior person in the room isn’t helpful.”

Business Managers reported that they preferred their former work patterns of considering their responses before presenting decisions in front of their superiors. The rationale behind these issues is culturally based, although the organisational culture had shifted towards an integrated team working environment, the mindsets and attitudes of the people involved had not, they adhered to the former working experiences. Therefore for this case study evidence suggests that where it was possible to change organisational culture through work processes and activities, peoples’ own cultures do not necessarily change within the same time frame.

8. DECISION-MAKING

The ability to make empowered decisions in a timely fashion, without referring to higher management for guidance or control is essential for a RAD-type approach. This proved problematic because of the reliance on former cultural behaviour and attitudes. Historically the organisational structure was typical of most Government departments and organised into a hierarchical line management structure where people reported directly to line managers working within a perceived ‘blame culture’ environment. Evidence of case material exposes the difficulty managers had in moving away from previous work culture of deferring decision-making to the highest level. For example one Business Manager commented “…the difficulty in the workshops was that people didn’t want to make decisions or couldn’t.” Despite the integrated development environment, evidence showed a continued adherence to the blame culture concept as Business Managers declined to make decisions. In retrospect the Project Manager accepts that there should have been stronger management of the people involved.

To resolve this issue, business users were appointed responsible for key business/functional areas such that they would become empowered to make pragmatic decisions to move development forward, but this was unsuccessful. Business Managers remained reluctant to make decisions. The aim behind the key decision-makers was to remove the blame formerly attached to the decision-making processes; and to empower and encourage people to move away from a risk adverse culture to a more risk taking behaviour. However, there is a fine distinction between being authorised, and being empowered to do something. Within the Department authorisation carried an implied responsibility, whereas in the context of this
case study, empowerment reflected the ability to do something because it was necessary to progress development. The former adhering to the idea of blame, the latter designed to remove the blame issue. An important objective was the implied removal of the blame perception that accompanied the authorisation status that was understood by senior management. However, the researcher believes that the subtle nuances behind this problem were not effectively communicated to those involved. There was evidence of a continued adherence to the blame culture concept. Empowerment was not enough, there had to be a willingness to make important critical business decisions, this was lacking. Even though the project consisted of an integrated development environment, the business managers were still working with mindsets of the former scheme specific management culture.

This analysis agrees with Morgan’s (1997) views that empowered decision making is inhibited by hierarchical cultures, although in this case study it pertains to the former culture. He states, “the limits of “empowerment” are usually quickly felt as people run into the constraints imposed by the existing hierarchy” (1997, p169). Analysis concludes that the issue here is one of both cultural and human aspects. The DSDM Consortium suggests that within bureaucratic environments that are supported by hierarchical structures, empowerment may be alien and difficult to achieve. Analysis confirms this was true of the case study.

9. CONCLUSIONS

Inherent issues typical of bureaucratic environments did not facilitate easy sharing of crucial knowledge and decision-making. Requirements elicitation suffered from cultural difficulties in terms of their atypical nature and the reluctance of participants to voice opinions in front of their superiors that affected the ability of the developers to meeting their deadlines. Analysis suggests that a lack of proactive leadership towards the JAD workshops, and of the management of people’ activities within the JAD sessions would have facilitated more focussed productivity towards development objectives, promoted a shift away from former cultures to acceptance of new working behaviours. Analysis confirms that the former information and authority flows were hierarchical and based on control and power operating within a risk adverse environment. Decision-making was thus deferred up the management line as former procedure dictated. Consequently this led to ineffective decision-making and project delay. Therefore the need for fast, authoritative decision-making that is associated with a RAD-type approach was difficult to achieve. However it is acknowledged that these issues need to be explored and analysed further within the context of the case study.

9.1 Critical Success Factors

The move away from the former culture of individual working scenarios towards collaborative working practices within a rigid, hierarchical, control oriented culture proved difficult for this project. Table 2 below suggests some critical success factors drawn from the real life experiences of this case study. Evidence puts forward a need for participants to understand the requirements elicitation techniques used, and to have the ability and willingness to make fast decisions. Evidence suggests weak people management and lack of proactive leadership hinder collaborative working practices required for a RAD-type development approach. As previous research (Jones and King 1998, DSDM) has shown problems experienced with requirements elicitation and decision-making suggests that a RAD-type development approach may not work well in bureaucratic cultures that tend to emphasise hierarchical structures.
CRITICAL SUCCESS FACTORS

| Understanding of Requirements Gathering Techniques |
| Timely and Informed Decision-Making |
| Collaborative Working Relationships |
| Strong People Management |
| Sustained Proactive Leadership |

Table 2. Critical Success Factors for Requirements Elicitation and Decision-Making.

REFERENCES


