Modelling the alignment of information systems and business strategy: an example from sustainable procurement

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requires business changes. A crucial success criterion for such projects is the degree to which technology and organisational changes contribute to business objectives, including sustainability. As a consequence, attempts have been made to model the alignment of organisational IT/IS with business objectives. This study examines such a case relating to the implementation of a sustainable procurement policy at a UK higher education (HE) institution.

The study explored the use of a form of VMOST (vision, mission, objectives, strategy, and tactics) modelling which supplied the business strategy (B-S) element in a broader B-SCP framework, which added considerations of context and process. This was used to analyse the assumptions underlying the implementation of the sustainable procurement policy.

Among the lessons learned was the need for a careful distinction between evaluating the characteristics of new/modified systems to be installed and evaluating the programmes of action needed to implement them. The VMOST/B-SCP framework was designed for IS developments, it was found to be also applicable where the nature of the change focused on new policies and

products and their components, the practices of manufacturers and suppliers and the resource efficiency and durability of the products themselves. It would be daunting to hold that information in an internal database. The information resources needed required access to a range of knowledgeable and trustworthy sources via an external information infrastructure [13].

This work had established current practices, but their relevance was undermined by the emergence at the home institution of a new sustainable procurement policy, to be implemented over the period 2011 to 2015, that would lead to changed practices. After some deliberation it was decided to attempt an assessment of the likely effectiveness of the plan by applying goal-modelling techniques.

2.0 Business/IT alignment models

Most business decisions are based on thinking about causality – that by doing X the result will be Y. Even where entrepreneurs take decisions intuitively (‘*Screw it! Let’s do it!*’), stakeholders would expect potential benefits of a proposed action to be identified before committing resource, i.e. that the costs of implementation and operation will be exceeded by the value of the benefits of the business change. [14]

A continuing complaint is that the increasing cost of IT/IS to organisations have not been matched by discernible benefits such as improved organisational productivity [15,16]. Thus there is a requirement for ensuring that business needs are effectively supported by information and communication technologies deployed by an organisation.

One suggestion has been the creation of Business Motivation Models (BMM) – a concept developed by the Business Rules Group (BRG) within the over-arching Object Management Group (OMG) [17].

This standard assumes that a ‘business plan’ outlining the characteristics of a desired system is produced before the physical system design, technical development or even detailed business modelling. This plan includes documentation of the motivation behind the business requirements.

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reliability. A number of quality improvement techniques exist such as the ISO 9000 series of guidelines, and Six Sigma, and adopting one of these frameworks would be one Strategy to achieve the Goal.

3.5 Tactics

These are a way of subdividing an overall technical solution or Strategy. They define courses of action within a broader Strategy that address specific Objectives. Thus the Tactics of upgrading networking configuration and adding more servers directly address the objective of improving (i.e. reducing) response times for online purchasers. The Tactic-Objective relationship is crucial to ensuring that the technology implementation supports business needs.

The BRG BMM framework states that Tactics could include: '*some device, capability, regime, technique, restriction, agency, instrument or method that may be called upon, activated, or enforced to achieve Ends'* [17 page 13]. Interestingly, it specifically excludes the business processes and workflows needed to exploit Means, and also the responsibility for such tasks. The reason for this appears to be a procedural one: business processes and workflow are the subject of a different BRG model. Businedeei.e.s di4(e)4(13.892 b)-12(uc(i)3lJ 0 57)1(8(s)66(t)-995 Twb(y)2550 Tde)0.000.0a0[(it s)

designed for the analysis and structuring of software development. The problem area being addressed in this work had IS elements but, as noted in the Introduction, these were

4.1.4 Delivery

This in effect referred to the capability of staff and external partners to carry out rational and efficient procurement activities.

4.2 Some issues about the 'strategic themes'

What is noticeable here is that environmental sustainability is not explicitly mentioned. Instead it is another university aim that seems more relevant: '*to achie*

Action	Theme	Detail	Reasoning
Centralise the use of procurement cards	1,2,3,4	To centralise the placing of orders via cards in Procurement Services	To ensure compliance with policy

Table 1 Fragment from a policy action plan

Figure 1 Graphical representation of goal modelling relationships

Figure 1 above shows how the results of a goal modelling analysis can be displayed graphically. Details of the notation can be found in Bleistein *at al* [21]. Clearly this is a small fragment, and a full model would be much more complicated. Cox [28] notes the use of the graphical representation is a powerful tool when presenting results of goal modelling analysis to clients, but are time-consuming to construct. Tables are the most convenient way of doing the initial analysis.

While relatively simple goal models may be the most effective way of communicating with lay stakeholders, larger more complex models may result in information overload. The classic solution to this is a 'divide and rule' approach where a complex problem is decomposed into a number of smaller less complex sub-problems. Jackson [26] identifies alternative ways of doing this:

a) Abstraction/decomposition. This is classic approach that divides a process into component sub-activities, each of which is expanded into more detail sub-sub-activities and so on. Thus process '*purchase goods*' might be decomposed into the sub-processes '*select goods*', '*ascertain price*', '*make payment*'. Good practice is to make each sub-component as self-contained as possible ('loose coupling').
b) Projection. This is similar to projection in relational data manipulation. Occurrences of a particular type of entity with some attribute in common are selected and isolated. The same occurrence can occur in different selections, for example, where someone has dual nationality.

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