REALISING THE POTENTIAL OF TECHNOLOGY TOOLS: EXPECTING THE UNEXPECTED

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Introduction

Comprised within the term "return on investment" is the implication that the benefit to be accrued from supporting an initiative matches with the expectation of its potential value. In the case of technology implementations, however, the outcomes of investment often do not align with the intentions of those who propose them. At one extreme visible improvement to organisational processes may be negligible. At the other, implementation "failure" may have a detrimental effect across the entire organisation, as has been illustrated in numerous high profile public sector cases in the UK in recent years. In other instances, the organisation enjoys a more positive experience, although the outcomes that result from the investment are not those anticipated at the time of proposal. With reference to research in the domain of sociotechnical studies, this paper establishes reasons why expectations of technology implementations are often misguided. Examples from a number of scenarios drawn from academic research demonstrate the phenomena of "unexpected outcome", and strategies for their accommodation.

The power of context

In the late 1970s and early 1980s Kling and Scaachi (1979, 1982) identified that the way that systems are embedded into organisations determines the degree to which users may exploit them. They argued that problems become evident when the social context and history of the organisation in which the new technology is situated have not been taken into account as part of the implementation planning process, and that the operation and enhancement of these implementations are compromised by shifting technical relationships, as well as fluid and complex social relationships. In particular, difficulties arise when it is assumed that:

- developers and users will act in a rational manner - whereas they work according to specific, short-term, personal agendas;
- initiatives will be adequately resourced - when, in fact, time and money are squeezed;
- the key players involved in the implementation command social and political power to motivate widespread adoption - which is often not the case

Work in this domain argues that systems should be viewed not as a mere set of neutral components, but as a form of social organisation that is subject to the limitations of available resources, for example in terms of funding, political power and staffing. Thus it can be argued that the *context* in which it is hoped that a technology will deliver return on investment is stronger than a simple combination of technology plus staffing. This has been demonstrated in earlier work on intranet development within a large professional services firm (Hall & Goody, 2007). In this paper the power of context is explored with reference to social computing tools and return on investment, both anticipated and achieved.

Case 1: Blogging for community building (rather than reflective learning) in an educational setting

The first case to be considered here is the potential of blogging in an educational environment. By 2004 much anecdotal evidence suggested that requiring students to blog about their educational experience would encourage them to reflect on their learning. Encouraged by this, for a third year undergraduate module in the School of Computing at

Napier University, the requirement for students to keep a private learning journal through the course of the semester was replaced by the obligation to write a weekly blog entry that would be accessible to the tutors and other members of the class. The students were also expected to contribute at least two comments to the work of their peers each week. This activity contributed to the course work element of the assessment for the module. An analysis of the students' output (Hall & Davison, 2007) revealed, however, disappointing levels of reflective comment. Although the tutors had the power to set the assessment task, they were less persuasive in communicating to the cohort the desired level of output. Added to this, as the blog resource grew, so did the influence of the students in determining the standard of future work to be submitted. In effect, the technology facilitated the strengthening of the power of the student group to provide the benchmark for contributions. It achieved this by making visible the (lower-than-expected quality) work completed to date. The available resources to support the exercise also had an impact here. Longer blog entries and comments would inevitably allow greater scope for reflection, but the students had a limited amount of time per week to devote to the module, and the main motivation of the majority was to do enough to get the marks required to pass. Similarly, the tutors could have made a bigger effort to reiterate the need for reflective comment had more time been available. A second unexpected outcome of this work was more positive: moving the need for the students to record their experiences from a private to a "public" sphere contributed to a strong sense of community and peer support amongst the student group. In effect, the blog environment provided a scaffold of social infrastructure for the module participants. This was obvious in the comments on main blog entries, the largest proportion of which, although showing no deep consideration of the module content, were friendly messages of encouragement to other members of the class.

The actual role of the technology platform as a determinant of the unexpected outcomes of (1) the failure of the students to reflect on their learning and (2) the creation of community is worth consideration. The negative outcome was perhaps less about blogging and more about teaching: in subsequent deliveries of the module the level of reflective comment has increased significantly, not least because this early experience highlighted tutor misassumptions over the extent to which students understood the need to be reflect on the module materials (such as the set reading) and activities (notably the weekly lab exercises). These were addressed in the provision of more explicit instructions to future cohorts. Similarly, the unexpected positive outcome related to social relationships within the group may also be little to do with the technology per se. Rather, the technology may have simply made visible existing social ties between individuals, with the bonus the possibility of their extension due to the nature of online environments in general (as opposed to blogs in particular).

Case 2: Social computing tools for project and information management (rather than knowledge management) in corporate settings

The second case discussed here also relates to blogging: an investigation of the deployment of internal blogs within corporate environments. The expectation was that this research would reveal the extent to which internal blogging contributes to new knowledge creation and innovation. Data were collected in 2007 in the form of responses to questions posed in a web-based survey and follow-up interviews. Most of the 50 internal bloggers who participated in the study worked in one of three large international computer-manufacturing firms. The output of this work, however, did not add to the understanding of processes of new knowledge and its contribution to innovation in product and service delivery as had been expected. Instead it revealed how blogging supports lower level activities such as information transfer and project management within teams. The main priority of the bloggers who participated in the study was to get their work completed by sharing practical information with colleagues in an environment that was superior to e-mail: it was clearly not perceived a locus for new knowledge creation.

Just as the students in the previous case had done, these bloggers were using a tool to assist them in supporting their personal priorities in an environment where resources were limited. It was mistakenly assumed that they would share the perspective of the researcher that blogs can be used in a sophisticated way as tools for knowledge management. This prejudice led to

the anticipation of research results that would demonstrate one thing, when, in fact, this was largely irrelevant. Applying this finding to the wider environment, this scenario points to how important it is that employees from one part of a business be aware of their professional perspective when dealing with colleagues from another. For example, on the basis of the findings from this study, it would appear that a knowledge management practitioner would not have sufficient social and/or political power to encourage colleagues to adopt social computing tools for the purposes of new knowledge creation and innovation if worker priorities were more focused on short-term goals such as completing a project.

This is not to say that blogging has no role in new knowledge creation: mundane, and sometimes apparently pointless, interactions such as those that take place in the blogosphere act as a form of social glue which binds people together in trust relationships (as demonstrated in Case 1 above), and the combination of a large number of small information exchanges may prompt innovation in product and services delivery in the future. However, in this case, these possibilities were not evident to the bloggers who participated in this study. It is this contextual factor that is of most importance here to those who are charged with encouraging others to adopt particular tools in the workplace.

Case 3: Anticipated and realised opportunity and risk in social computing in business environments

Case 3 draws on the findings of research into the value of social computing tools in business environments. This project, jointly sponsored by Napier University and TFPL Ltd, drew its findings from the analysis data collected from a web-based survey, focus groups and telephone interviews in summer 2008. Approximately 80 knowledge and information management practitioners took part in these exercises. One key aspect of this work was to assess the relationship between the anticipated opportunities and risks that social computing present to organisations, and the extent that these had actually been realised within the workplaces of those who participated in the study. Of particular interest in the context of this paper are instances where these elements did not match.

In terms of opportunities, study participants had high hopes that social computing tools would lead to enhancement in collaborative work practice. In particular, they saw the potential of social computing tools to improve knowledge and information sharing, to connect individuals and groups, and to widen communication channels. They also expected improvements in organisational information management practice and productivity in general, as well as positive cultural change and widened employee choice. In practice, with the exception of cultural change and employee choice (where all experience to date had been positive), the extent to which organisations had capitalised on these opportunities was mixed. In effect, it was highly dependent on the environments in which the implementations had been made. These local conditions were largely determined by the choice of technology implemented and the extent to which it was resourced. On the whole, the information and knowledge management staff who contributed to this study had limited influence over these decisions. As is the case with the other examples presented here, Kling and Scaachi's identification of the *context* of technology implementation, rather than a simple combination of technology and staffing resources, was shown to be of relevance as a determinant of return on investment.

A detailed analysis of the data relevant to risks posed in social computing environments further emphasises this point: of all the risks, implementation failure (for example, non-adoption, partial adoption, or inappropriate adoption) was found to be the most important, both as a potential and actual problem. Thus it can be seen that the study participants recognised that *how* an implementation is managed and the culture into which it is introduced (with regards, for example, to the corporate intention of the implementation and the length of time that the organisation is prepared to wait for it to mature and generate a positive impact) may be more important than *what it comprises* when return on investment is under scrutiny. This is an interesting finding given that implementation failure is not as frequently cited in the

professional press as other risks[1] related to social computing tools. A second outcome of the study related to risk leads to a similar conclusion related to context. This concerns fears related to compromised security, a much-discussed topic, particularly in the mainstream media. Although anticipated by knowledge and information managers as a problem in the pre-implementation stages, in practice security breaches were not regarded as an issue in the study participant organisations. One explanation for this could be that the high level of attention paid to security risks by journalists when discussing *consumer* use of social computing tools had influenced pre-implementation perceptions of those whose planned adoption was in *business* organisations.

Conclusion

These cases have shown that the actual value to be accrued from a technology investment may be difficult to predict, especially in cases where the specifics of the context in which the implementation is to be deployed is not fully appreciated. What may work in one environment - particularly the "ideal" assumed by systems vendors[2], where there is whole-hearted organisational buy-in for the system and staff are motivated, trained and supported in its deployment – may not transfer to the local context of another[3]. This applies whether an implementation is a top of the range solution, such as the licensed social computing environments enjoyed by a number of the participants who contributed data in Case 3, or a more modest investment, such as the blogs that the students were encouraged to use in Case 1[4]. There are also dangers in imposing perceptions that derive from a particular standpoint on expectations of a system. This applies whether these originate from the professional mind-set of a sub-set of those involved in the implementation (for example, knowledge and information managers who assume that everyone will share their enthusiasm for the latest tool to support collaborative work online) or external agents such as industry commentators. Equally, return on an investment may lie in unexpected positive outcomes, such as the value of the blog environment for building a community spirit amongst the students in Case 1 above. Efforts in predicting the impact of technology investment and whether or not it will be worthwhile require varied levels of focus: close attention to the context of its implementation is best viewed unhindered by the values of a particular actor set. Another key contextual issue is time. Here Case 1 shows a degree of maturity in an implementation that has now been adapted over the course of four academic years, whereas Cases 2 and 3 outlined here relate largely to recent tool adoption. In line with this, "relative" return on investment (insofar as the cases might be compared) appears to be more positive in Case 1. From a broader perspective it should be acknowledged that in the long-term it may be the case that the most trivial of interactions supported by social computing technologies that are later considered to have been the most valuable, or an apparent failure is later demonstrated to have been a key component in future success.

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[1] For example, those related to information management experienced in practice, such as managing the proliferation of information resources and ensuring effective information access. In this study the extent to which the adoption of social computing tools would exacerbate existing problems matched with the degree to which this had fear had been realised in practice.

[2] And often those keen to "sell" an implementation within their own organisation.

[3] This calls into question practice of site selection for piloting new technology implementations that favour starting small with enthusiasts in one area of the business.

[4] An analogous example would be to present a new car to a motorist with poor driving skills. Even if the vehicle is a top of the range model, this is unlikely to convert that person into a great driver. Risks will accrue the longer this person continues with his/her bad driving habits, and will become greater if the car is not maintained and/or it is taken out in non-ideal circumstances such poor road conditions.

Acknowledgements

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