AN APPETITE FOR CREATIVE DESTRUCTION: SHOULD THE SENIOR ACADEMIC TECHNOLOGY OFFICER BE MODELLED ON THE CIO OR THE CTO?

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Abstract

We examine the emerging role of Senior Academic Technology Officer and the shift from having acknowledged expertise to acquiring legitimate organizational power. We are particularly interested in the match or mismatch between their own appetite for radical technological change, i.e. for creative destruction (Schumpeter, 1942) and that of the institution. We also consider two existing templates for such a role from mainstream information management and information technology: the Chief Information Officer and the Chief Technology Officer.

Introduction

Technology enhanced learning (TEL) has newfound strategic importance within tertiary institutions whose mission is to deliver flexible distance- and/or mass-education (Shurville et al., 2008; in press). A senior educational technologist (SET) who is embedded within an institutional service is in an excellent position to fulfil the role of local TEL champion, which has been shown to be extremely influential in many institutions (Browne et al., 2008). Consequently, senior SETs are increasingly exercising expert power as change and innovation agents, although in the majority of cases they have not transitioned into leaders of institutional services (Shurville et al., 2008; in press).

Nevertheless, their growing influence has been recognized by the Association for Educational Communications and Technology (AECT). The AECT recently re-defined educational technology from a profession "concerned with the design, development, utilization, management, and evaluation of processes and resources for learning" (Seels & Richey, 1994, p. 1) to one concerned with "the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources" (Januszewski & Molenda, 2008, p. 1). As Richey comments: "a critical addition to

[this] definition is the term 'improving performance'. This echoes the demands now placed on our field. Effective products are no longer the primary goal. Even learning is no longer the only goal. Our efforts are expected to impact transfer as shown in individual and organizational performance improvement" (2008, p. 24). Richey's position is supported by a recent U.S. survey which highlighted the increased organizational legitimacy, influence, and in some cases power of this role (Albright & Nworie, 2008). Accordingly, Albright and Nworie recommend that institutions add a Senior Academic Technology Officer (SATO) to their organizational structure thus transforming influence and expert power into legitimate power. They argue that "campus leadership [for TEL] should never sit lower than one echelon below the chief information officer (CIO)" (Albright & Nworie, 2008, p. 21). So the SATO is a new and relatively senior role whose widespread adoption could mark a coming of age for SETs. Filling the role requires a combination of soft skills in areas such as change management and pedagogy as well as harder skills in techné (Shurville et al., 2008; in press). Here we examine the emerging role of the SATO and consider templates that could be borrowed from industry. An appropriate definition and choice of template is important because they will give the SATO room to provide authentic leadership. Studies have shown that authentic leadership can be an especially important success factor within higher education, because other motivators, such as financial reward, are less available within the sector (Shattock, 2003).

We shall discuss the match between a SATO's own appetite for incremental or radical technological change, i.e. for creative destruction (Schumpeter, 1942) and the corresponding appetite of the institution. We will also consider two existing templates for this role that higher education could borrow from industry viz. the Chief Information Officer (CIO) and the Chief Technology Officer (CTO) (see Lane & Koronios, 2007). Our discussion is informed by a reflective case study and by the excerpts from a virtual anecdote circle of stakeholders based in Asia, Australia, North America, and the United Kingdom.

Individual and Organizational Appetites for Creative Destruction

Institutional TEL services are good examples of socio-technical systems. The socio-elements of a TEL service can include academic development and learning design while its technical-elements can include a combination of managed, personal, and virtual learning environments (MLE, PLE, VLE). One of the key tasks of developing and maintaining a socio-technical system is that of ethical role design (Søndergaard et al., 2007). A premise of socio-technical theory is the importance of "the provision of learning experience for all employees that will provide challenge and enable them to increase their skills, to work cooperatively with others, and to become efficient decision takers and problem solvers"

(Mumford & Axtell, 2003, p. 335). So we believe that those designing roles for managers of socio-technical systems should acknowledge the requirement for both soft and hard skill sets. In the case of SATOs the role also needs to include knowledge and experience of learning and teaching &, increasingly, research and scholarship. To engage and retain SATOs they should therefore include responsibilities that are engaging and meaningful to individuals with inclinations to develop and apply all of these skill sets (see Herzberg et al., 1958). Moreover, to reduce dissatisfaction amongst SATOs, that could lead to flight risk, they should ensure that relevant policies, supervision structures, and working conditions are in place (see Herzberg et al., 1958; Shurville et al., 2008, in press). The validity of this premise at the coalface of socio-technical systems is evidenced by multiple studies of software developers, which show that empowerment leads to increased productivity and retention (Hall et al., 2008).

A well-designed role for a SATO should be sustainable for the individual and the organization (Saxe-Braithwaite et al., 2008). However, for the task of managing an institutional TEL service to be challenging and meaningful to an individual, some account needs to be taken of their own values (Blunt, 1983) and motivations towards leadership (Sosik, 2005). For example in ICT, some managers find satisfaction in maximising organizational efficiency while others are driven by transforming organizational effectiveness via innovation (Hunter, 2007). We can describe the former managers as having lower appetites for creative destruction and the later managers as having higher appetites for creative destruction (Schumpeter, 1942). Here we argue that those with a lower appetite for creative destruction are more suited to the role of CTO, while those with a higher appetite for creative destruction are more suited to the role of a CIO. The key question is 'which is needed by the institution?'

The CTO and the CIO

In a recent empirical study of the relationships between CTOs, CIOs, and a variety of organizations, Hunter (2007) characterized the difference between prototypical CTOs and CIOs. In Hunter's terminological shorthand: a CTO "will focus on the management of current operations with an emphasis on efficiency. That is, given the existing information technology services, how can these resources best be employed to support the company in the short term" (p. 264); and a CIO "will focus on effectiveness. The CIO will look beyond the present information technology resource base with a view to employing information technology in an innovative way to facilitate future initiatives" (p. 264). Hunter's research demonstrates that there is often some confusion between these idealised roles and the work that individuals who are recruited to fill them are expected to do. To appreciate the difference you might like to equate the CTO with business process

improvement and the CIO with business process redesign or transformation. In other words, an efficient CTO should exhibit a controlled appetite for creative destruction and an eye for managerial detail within an existing business model. An effective CIO should exhibit a higher appetite for creative destruction.

Dealtry (2002) describes the dichotomy between a CIO and a CTO in the context of defining the attributes of a corporate university, and acknowledged the danger that an ill-conceived choice will mean "perpetuating existing structures and thinking that do not allow management to do what is necessary for a more effective intellectual orientation of the company" (Dealtry, 2002, p. 17). This point is exemplified by the new tension between running a conventional VLE 'efficiently', which is closer to the purview of a CTO, and the challenge of implementing a PLE 'effectively', which is closer to that of a CIO.

Hunter's research also shows that this difference is often ill-understood by both individuals within these roles and by organisations (Hunter, 2007). So, candidates for the role of CTO whose natural avocation is innovation can mistakenly apply for a position requiring a CIO and vice versa. Moreover, organisations often advertise for an innovator when one is not required. This can be because they practice unrealistic recruitment, i.e. they oversell the importance of a role to attract applicants and enhance their own reputation (see Wanous, 1978, cited in Raub & Streit, 2006).

We argue that institutions can be characterised in similar ways to individuals. With reference to the Moore's Technology Adoption Life Cycle (Moore, 1991), enthusiastic institutions exhibit higher appetites for creative destruction while mainstream institutions exhibit lower appetites (see Luckin et al., 2006). The higher its appetite, the more that the institution is prepared to challenge the scope of its business and culture using ICT (see Venkatraman, 1994). We should clarify that ICT is rarely the driver, per se, but rather it follows in the wake of new institutional visions, such as the teaching-research nexus. How ICT is used to respond to such visions depends on whether this joint appetite for creative destruction is shared.

So, designers of the role of university's SATO should examine whether accountability, control, influence and support that they design into the envisaged role will confer legitimate power to the SATO that matches the organization's own appetite for creative destruction. Moreover, those who are selecting candidates for the role should assess whether each candidate's appetite for creative destruction matches that of the organization. Finally, candidates should consider whether the organization is cognizant of this issue and has assessed both appetites correctly.

A Lived Experience

The following case study exemplifies some of the issues brought by a mismatch between individual and institutional appetites for creative destruction. In 2002, Shurville was recruited as a project director at a UK university with a portfolio to develop and roll out a managed learning environment (MLE) and a virtual learning environment (VLE). Making the organization more efficient, by delivering and embedding the MLE, required the attitude and skill set of a CTO (see Shurville & Williams, 2005). Transforming the organization to be more effective, by delivering and embedding a VLE and instigating online learning, required the attitude and skill set of a CIO (see Luckin et al., 2006). Hence he assessed the role as a satisfactory hybrid of CIO and CTO.

While Shurville's natural proclivity was towards being a CIO, he was happy to take on the combined role as it appeared to provide opportunities to develop skills in both efficient and effective management. Subsequent to accepting the role, it became apparent that senior management was only motivated by delivery of an MLE that leveraged existing information technology services to support the company in the short term. Despite public support for introducing a VLE, as expressed in Shurville's role description, senior management was privately resistant to developing a VLE that would look beyond the present information technology resource base with a view to employing information technology in an innovative way to facilitate future initiatives. In other words there was a mismatch between the senior management's espoused appetite for creative destruction and their underlying resistance to it. There was also a mismatch between Shurville's aspirations towards being a CIO when the organization was consciously or unconsciously seeking a candidate with the aspirations of a CTO.

The situation revealed itself to be more complicated in a number of ways. Some internal conflict in appetites for creative destruction between members of senior management and the project steering group became apparent, which undermined the confidence and institutional profile of the staff engaged in the VLE initiative. Subsequently, the senior management team changed sufficiently, such that the need to implement flexible learning via a VLE, which had been demonstrated at the grass roots level, became recognized (Luckin et al., 2006).

Community Views

So, how does this narrative generalize across the experiences of the community? We asked a panel of 20 senior administrators, SETs and academics with an interest in managing TEL three questions designed to elicit opinions and experiences. Here we present a selection of the most interesting answers from academic stakeholders.

Q1: Does the role of a CIO or a CTO come closer to the requirements for a SATO?

". . . the role of SATO varies in seniority from institution to institution but the more senior the position within the institution's hierarchy, the closer [it] is to a 'CTO'. I equate 'CTO' more closely with a role of a manager and the 'CIO' role exhibiting more leadership qualities. This also appears true for centralized roles versus more localized ones (i.e. located out with the disciplines), i.e., more 'CTO's in centralized units and more 'CIO's out at the coalface."

"CIO comes closer given your definition above; however, I don't know any universities that follow the corporate distinction. . . most universities I know have a single CIO role, which is actually all of IT. More importantly, most university CIOs I have known have a focus on enterprise IT management. . . and less on innovation or creative destruction, this tends to come more from innovative academic staff, and this often leads to conflict with CIOs."

"Much closer to a CIO. Those I have had close contact with are quite focused on institutional change and pedagogy as much as technology. . . they tend to be more experimental and strategic in their approaches, seeking funds and support to extend and improve learning opportunities. . . in both my current institutions there is a layering and distribution of the role so an individual's power is somewhat limited: others at different levels in the organisational hierarchy play a strong balancing part. . . the eternal war between networking departments and learning technology departments often acts as a counter-balance to radical change."

"The SATO should bend more towards the definition of CIO rather than CTO. However, I am concerned that both definitions have limited relevance to learning contexts."

"Is the SATO for research and/or learning or both? In the UK old universities the role may be combined (and this makes sense). However, in new universities, the latter role is paramount but the role itself (SATO) if it actually exists is usually distributed. In any case, in universities the CIO is typically a librarian, the CTO is in IT systems, and these two areas often have the problem of interoperating. If the SATO is as you say a 'SET' they are far and few between in universities. . . and are slowly being recognized as important by top level management but have workflow with other layers of senior management that can best be described as innovation in 'slowmo'."

"I would expect someone with the title of SATO to have both an eye on the efficiency of an organisation at the current moment in time and an eye towards the potential of future initiatives to improve the current offering, both in terms of user experience and efficiency. I can't really see that these two can be separated, although I can see that an emphasis could be placed on one focus or another, but a close working relationship between two different posts would then be essential."

Q2: Does a SATO's appetite for creative destruction need to match the institution's?

"I think this is a personal choice of the SATO. Different individuals have different tolerance for frustration and challenge, as do the management of institutions."

"It is always better if a leader of innovation and creative disruption is understood and valued by an organisation, and their activities recognized as part of the strategic plan of the organization — of course this is rare, but not impossible. What is more common is that innovators come into conflict with existing power structures with unhappy results. In a university, the innovator can sometimes survive outside the mainstream IT management through gaining independent funding (often from outside the university), or through some designation of a 'space' for innovation/disruption which is accepted as a non-core activity (various innovative research centers would fit this category). However, the real test is whether the innovations from an innovation group can make the transition into the mainstream IT (and academic) core of the university. This is an issue in both e-learning and more recently in e-research. In general, innovations are picked up at other institutions more easily than in a home institution, which seems an unfortunate outcome."

"It depends what is meant by 'institution'. The bottom-up and innately conservative groundswell of custom and practice within an institution may often be at odds with SATOs who see their role as instruments of change. However, I will take 'institution' to mean the entity that is defined by its management, policies, embedded practices and strategies. I have been lucky to have been associated with creative SATOs with strong communication skills and I suspect that this is the norm. They tend to come from inter-disciplinary backgrounds (usually education, computing and/or AN.Other). They talk well and listen well, so (whatever their personal inclinations) they tend to reach fairly close alignment with the institution, partly by promoting their causes in the right places and thus bringing about change, and partly by listening to higher management's goals and interests and aligning themselves with them. It's about negotiation. They are part of the institution, not separate from it. Wild mavericks tend not to get hired, nor do they last long in that role when they are. Having said that, I am not aware of any instances where SATOs are the conservative force in this equation and those that

are successful succeed in part because they push the envelope and want to bring about revolutions. The SATOs (or equivalents) I have known see their roles as transformative, meaning that they are often extending the boundaries and fighting conservatism. I suspect that there are two primary forces that drive this tendency. On the one hand, they are drawn to the field because of its innate affordances to change the status quo and, on the other, their roles naturally act as magnets for those who are keen to push the boundaries: they tend to talk more with those who want to change things and try new approaches, thus reinforcing their beliefs."

"Since the institution does not have a single voice it would be hard to match it. The dichotomy does not ring true. Why must there be either efficiency or effectiveness? Why is effectiveness associated with radical transformation? I would presume that the SATO role would be to lead peers as well as to advocate for peers to university organisational structure. As such there would be a constant shifting between incremental change and radical transformation depending on the technology, purpose, culture, etc."

"Surely, the SATO should be leading the institution's appetite with respect to technology? This may not indicate a lack of match, of course, more a lack of emphasis or direction at a particular point in time."

"The situation can be dynamic but depends on the institution's strategic plan. To convince factions and tribes you have to talk efficiency and evidence. Once you are on the road to change I think you need to gather evidence along the way for continued investment and eventually transformation.

Q3: What are the beneficial or detrimental impacts of a mismatch between the SATO's appetite for creative destruction and that of the institution?

"Benefits can be gained from a CIO being mismatched to the extent that they are required to implement change within an organization. Even if this person needs to be reigned in from time to time, progress will still be seen to be made by both sides. I think the disparity of mismatch that can be tolerated with a CTO is less. This would often be regarded as poor management and is less palatable. However, in all cases, if the mismatch is too great, the resultant conflict will not be productive and the SATO will feel impotent in their role."

"The benefits usually arise from the fact that technology is changing so fast, and with such broad impact, that some people need to be a the leading edge, so that their understanding and lessons can be transferred back into the mainstream in due course. Even with a mismatch, a time will usually come when the need to understand technology innovation outside the university is important even to the mainstream IT (e.g., the rise of Web 2 technologies), and so the innovator may be

helpful in this context. However, there are many detrimental aspects of the mismatch — wasted funding on innovations that aren't adopted, unhappy innovators who leave following frustration (and after consuming special innovation funds), unhappy CIOs who feel challenged by innovators in ways that are unhelpful to their core "basics" IT requirements, and university leaders, who rarely see benefits from disruptive innovation in the short term."

"There is nearly always a slight mismatch or no change would occur, but it is self-balancing in the cases I know of and I have never come across a case where the balance swings too far one way or the other — I guess they wouldn't be hired in the first place if they were wildly at odds with the institution's appetite for creative destruction. SATOs face bigger problems in fighting with mismatches between institutional tendencies and the technologies they support and promote. The kinds of technologies that tend to become centralised in an institution play a major role in structuring the learning experience (notably LMSs/MLEs/VLEs, etc.) so it is more often the technology itself that leads to mismatches — it becomes a force that embeds the status quo. It is often the case that LMSs embed and reinforce norms (e.g. content delivery paradigm, teacher in control, segregation between dialogue and process etc) so they actively work against the SATO's desire to enable radical change and probably that of the institution too."

". . . there is already a tension between what academics want to do with technology in their institution and what that institution sanctions as well as technically supports. This tension is also present in the roles of Academic Development. I think that an effective SATO will necessarily have to be someone who is willing to continually grind away at an institution's natural tendency for delay, prevarication, standardisation, risk over-management, and death by committee."

"I would see the role of a SAT as a leadership role and as such whilst their overall strategy would need to be in-line with the ethos of their institution it could also challenge current objectives and push for further change. So whilst their needs to be a general like-mindedness between senior institutional leaders about the fundamentals of the institution, there can of course be an advantage in a mismatch in some views about how to achieve its overall aims. These should get thrashed out in healthy debate as part of the decision making process."

"I have had to put this appetite on hold in order to get my feet under the institutional table. Ironic given that you get noticed by what I would call creative disruption. However, the world is changing and we (my institution is not even now in catch up mode; and I confess to be getting somewhat twitchy."

Conclusion

Hiring a SATO with an appetite for creative destruction mismatched to that of the institution can have negative outcomes for both parties (Phillips, 1998). So we recommend that institutions clarify whether they require a SATO modelled upon a 'CIO' or a 'CTO' and design the role and recruitment appropriately. However, SATO's must be realistic about how far individuals with large appetites for creative destruction should be promoted to senior management because "among the paradoxes that abound in academia, one of the most curious is the apparent coexistence of radical chic with entrenched conservatism" (Becher & Trowler, 2001, p. 97).

Acknowledgements

References

Albright, M. J., & Nworie, J. (2008). Rethinking academic technology leadership in an era of change. *Educause Quarterly, 31*(1), 14–23.

Becher, T., & Trowler, P. (2001). *Academic tribes and territories: Intellectual enquiry and the cultures of disciplines*. Milton Keynes: Open University Press.

Blunt, P. (1983). Motivation through job design and orientations to work: A theoretical reconstruction and synthesis. *Australian Psychologist*, *18*(2), 191–200.

Browne, T., Hewitt, R., Jenkins, M., & Walker, R. (2008). *Survey of technology enhanced learning for higher education in the UK*. Retrieved April 6, 2009, from UCISA Survey, http://www.ucisa.ac.uk/publications/tel_survey.aspx

Dealtry, R. (2002). *Configuring the corporate university: Managing a portfolio of thinking schools*. Birmingham: Dynamic SWOT Associates.

Hall, T., Sharp, H., Beecham, S., Baddoo, N., & Robinson, H. (2008). What do we know about developer motivation? *Software, IEEE, 25*(4), 92–94.

Herzberg, F., Mausner, B., & Snyderman, B. B. (1958). *The motivation to work*. New York: John Wiley.

Hunter, M. G. (2007). *Contemporary chief information officers: Management experiences*. Hershey: IGI Publishing.

Januszewski, A., & Molenda, M. (Eds.). (2008). *Educational technology: A definition with commentary*. New York: Lawrence Erlbaum.

Lane, M. S., & Koronios, A. (2007, Dec.). Critical competencies required for the role of the modern CIO. In *Proceedings of 18th Australasian Conference on Information Systems* (pp. 1099–1109). Toowoomba, Australia.

Luckin, R., Shurville, S., & Browne, T. (2006). Initiating e-learning by stealth, participation and consultation in a late majority institution. *Journal of Organisational Transformation and Social Change*, *3*(3), 317–332.

Moore, G. (1991). *Crossing the chasm: Marketing and selling technology products to mainstream customers* (2nd ed.). Oxford: Harper Business.

Mumford, E., & Axtell, C. M. (2003). Tools and methods to support the design and implementation of new work systems. In D. Holman, T. Wall, C. Clegg, P. Sparrow, & A. Howard (Eds.), *The new workplace* (pp. 331–346). Chichester: John Wiley and Sons.

Phillips, J. M. (1998). Effects of realistic job previews on multiple organizational outcomes: A meta-analysis, *Academy of Management Journal*, *41*(6), 673–690.

Richey, R. C. (2008). Reflections on the 2008 AECT definitions of the field. *TechTrends*, *52*(1), 24.

Raub, S., & Streit, E. M. (2006). Realistic recruitment: An empirical study of the cruise industry. *International Journal of Contemporary Hospitality Management*, *18*(4), 278–289.

Saxe-Braithwaite, M., Carlton, S., & Bass, B. (2008). Aligning career development with organizational goals: Working towards the development of a strong and sustainable workforce. *Nursing Leadership, 22*(1), 56–69.

Schumpeter, J. A. (1942). *The process of creative destruction*. New York: Unwin.

Seels, B. B., & Richey, R. C. (1994). *Instructional technology: The definition and domains of the field*. Bloomington: AECT.

Shattock, M. (2003). *Managing successful universities*. Milton Keynes: Open University Press.

Shurville, S., Browne, T., & Whitaker, M. (2008). Employing educational technologists: A call for evidenced change. In *Hello! Where are you in the landscape of educational technology?* Proceedings of ASCILITE Melbourne 2008. Retrieved April 6, 2009, from http://www.ascilite.org.au/conferences/melbourne08/procs/shurville.pdf

Shurville, S., Browne, T., & Whitaker, M. (in press). Accommodating the newfound strategic importance of educational technologists within higher education: A critical literature review. Accepted for publication in *Campus-Wide Information Systems*.

Shurville, S., & Williams, J. (2005). Managing in-house development of a campus-wide information system, *Campus-Wide Information Systems*, *22*(1), 15–27.

Søndergaard, S., Kerr, M., & Clegg, C. (2007). Sharing knowledge: contextualizing socio-technical thinking and practice. *The Learning Organization*, *14*(5), 423–435.

Sosik, J. (2005). The role of personal values in the charismatic leadership of corporate managers: A model and preliminary field study. *The Leadership Quarterly*, *16*(2), 221–244.

Venkatraman, N. (1994, Winter). IT-enabled business transformation: From automation to business scope redefinition. *Sloan Management Review*, 73–87.

Wanous, J. P. (1978). Realistic job previews: Can a procedure to reduce turnover also influence the relationship between abilities and performance? *Personnel Psychology*, *31*(2), 249–58.