

Investigating the Role of Value Creation in Information Systems Relevance

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The purpose of this paper is to provide an explanation towards achievement of relevance in the field of Information Systems (IS) by pointing out the critical role of value creation amongst the various stakeholder groups.

The research approach was positivistic in its orientation. A survey of IS Lecturers, IS undergraduate and postgraduate students and IS practitioners was conducted, with 311 respondents. Questions focused mainly on current and future perceptions of IS value as well as respondent opinions on the value creation strategies that are critical in ensuring IS relevance amongst the various stakeholders. Descriptive statistical analysis was employed to explore the perceptions of the various respondents on the issue of IS relevance and value creation as an antecedent.

The findings support the view that the IS discipline needs to focus more of its efforts on improving delivery of application knowledge and research whilst at the same time emphasizing less on other knowledge types such as theoretical and technical knowledge. Furthermore specific aspects of IS knowledge and research such as its usefulness and its transferability need greater attention.

Keywords: Value Creation, Benefits, Framework, Value Currencies, Knowledge, Research.

ACM Classification: K3.2

1. INTRODUCTION

Is Information Systems (IS), as a discipline and a practice, in crisis? The purported state of IS as a discipline in crisis is shared by many stakeholders in academia as well as in industry (Cecez-Kecmanovic, 2002). A number of perspectives can be used to underscore the prevalent crisis reminiscent of IS. These perspectives can be captured by the predominantly historical disconnect between the theory and practice of IS, which is claimed should be diminished through the integration of academic and practitioner efforts, attitudes and incentives to IS research (Anandarajan and Lippert, 2004). In order to achieve the connection between theory and practice, Kohli (2001) suggests that academics and practitioners should interact more frequently with each other in order to mutually address their concerns and problems. This interaction would involve extensive dialog between the stakeholders in an attempt to agree upon fundamental, applied and disciplinary problems that exist within the field (Amaravadi, 2001). These research opportunities should then published in public domain and updated on a regular basis. Similarly, another method would be to use an “open source” method, via web forums, to develop a common research agenda

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(Mc Cubbery, 2003). These suggestions would enable academics to focus their attention on issues plaguing the practitioner community, currently and in the future (Mc Cubbery, 2003). The historical disconnect between theory and practice in IS can be understood from three views: rigour in IS research, incentivisation in IS and stakeholder collaborative partnerships.

The emphasis on the rigour of IS research has been on how to make research outputs relevant. Concern is therefore how to make primarily academic research, more rigorous and transform the results into more *relevant* information for the users. One such example is for IS researchers to package and distribute two sets of their research (Lang, 2003). The first consists of more thorough documentation and publishing of research results in respected academic journals. The second, being a scaled down version of the first, in which findings of academic research are published in more practitioner friendly channels. Similarly, Weinberg (2001) argues that IS researchers should look to publish their findings in more appropriate mediums in order to communicate their research to the business world. This view emphasizing the need for the transformation of IS research towards *relevance* is described as leveraging of the academic perspective through appropriate results interpretation (Weinberg, 2001).

Incentivisation elevates the concern about the current structure of the remuneration system within the IS domain. Restructuring of the reward system in IS predominantly focuses on the alteration of the academic remuneration system. Amaravadi (2001) recommends that the reward system be more geared towards supporting research that facilitates problem solving. Not only should academic institutions reward research that reaches the industry communities, but they should also reward and encourage members of staff that are able to demonstrate practical examples of academic theory (Lang, 2003). One of the ways to accomplish this is for the departments to recognize practical experience as a substitute for an academic degree, in order for practitioners to enter the faculty at the associate or even full professor level (Heart and Pliskin, 2001). Thus IS departments should do more to co-opt IS professionals into associate or part-time academic posts (Lang, 2003). Heart and Pliskin (2001) describe how academic organizations can encourage practitioner participation by designing career paths that will allow for the smooth transition between industry and academic careers without them having to start out low on the academic ladder in terms of status and pay. Therefore the restructuring of the reward system is orientated towards ensuring the flow of experience from industry into academia, which inevitably ensures that the IS programs being run in universities remain aligned to industry needs.

The third perspective employed to understand and used to explain a possible resolution to the historical disconnect between the theory and practice of IS revolves around the need to elevate the role of collaborative partnerships between academia and industry. The concept of collaboration is captured by Heart and Pliskin (2001), quoting McMaster (2001) that: there is a place for pure theory/philosophy, just as there is a place for practice alone (without theory); however each is undoubtedly impoverished without the other (Heart and Pliskin, 2001). Collaboration encourages a different approach. For instance, enticing professionals into the academic world by allowing them to become “practitioner scholars” by enabling them to conduct research that is both audience focused (relevant) and academically sound (rigorous), and thus relevant to both communities. This can be achieved by providing PHD level education to successful IT professionals who cannot attend full time doctoral studies due to family and work commitments (Borchers, 2001). It is also important for IS academics to spend time in the business arena in order to align their academic knowledge with business practice. Both Kohli (2001) and Lang (2003) state the need for IS academia to take sabbatical leave or career breaks in the IT industry is crucial facilitating understanding of each other’s strengths and challenges. This can be accomplished due to a

favourable academic calendar in most universities which allows for many opportunities for academics to engage in practical experience during the long year end breaks (Chan, 2001).

What appears to be elevated in the three perspectives is an attempt to ensure that IS remains relevant by eliminating the disconnect of the academic view from the practitioner view. The above short review has teased out the concerns of *rigour*, *IS rewards systems* and *collaboration* which are being brought out as possible ways of reducing this disconnect. IS research rigour, reward systems and collaboration reflects on images of value perceptions that should characterize the theory and practice of IS. This research therefore further illuminates the concept of *relevance* and IS by linking it to *value creation* as an antecedent in the context of South Africa as a developing country. Relevance as a concept is considered as apt since notions of acceptability by stakeholders comes to the fore when discussed in the context of a young discipline such as IS (Benbasat and Zmud, 2003; Alter, 2003; Power, 2003). Thus a solid and visible relationship between theory and practice is arguably instrumental in creating sustainable value, and hence relevance in a discipline such as IS, largely characterized as an adhocracy.

The article has four main sections. The first section presents the theoretical framework that was used for grounding the study; the second section discusses the methodology that was adopted; the third section presents the results of the quantitative analysis while the last section provides a discussion and summary of the findings, implications and conclusions.

2. THEORETICAL UNDERPINNINGS OF VALUE CREATION AND KNOWLEDGE TYPES

This paper magnifies the concept of value creation and its role in IS relevance from two main theoretical contributions. The first stems from the theory of value creation which has traditionally tended to focus on the traditional value chain. The dominant conceptualization of the traditional value chain process is rooted in an industrial age production line model, considered as an evolutionary process for achieving competitive advantage at firm or industry levels. Porter (1985) used the traditional value chain concept primarily to refer to the firm-level activities through which a firm produces value for its customers. Porter also conceived industries as interlinked value-chains of individual firms who engage in competition driven exchange relationships in a primarily linear process (Möller and Svahn, 2006). The assumption of linearity of the value creation process within a competition driven market exchange relationship has been criticized as untenable, especially since the role of value creation is increasingly being recognized as a complex web of dynamic exchange relationships (Currie and Parikh, 2006). The traditional notion of value creation has therefore been superseded by a more enterprise model characterized as the value network or the value web (Allee, 2000; Allee, 2007).

The value network perspective advances the role of knowledge which is commonly accepted as a core element of the fifth wave structural change in capitalism, commonly referred to as the digital knowledge economy (Ives *et al*, 2002). The value network perspective puts a premium on not only the exchange process, but also elevates the necessity for knowledge and other intangible assets of the value conversion process, such as human competence and the formation of strong collaborative relationships (Venezia and Allee, 2007). The value network is considered as epitomizing a set of roles and interactions in which various stakeholders focused on a particular goal engage in both tangible and intangible exchanges to achieve economic or social good (Allee, 2007).

Given that the paper is concerned with the relevance of IS, the notion of the network as the primary mechanism for value creation provides an apt metaphor for understanding the dynamics of tangible and intangible value exchanges amongst the various stakeholders of the discipline. IS as a discipline, is therefore conceptualized as a purposeful network geared towards attaining certain

economic and social goods. The IS network can be considered to comprise an internal value network which includes activity focused sets of relationships between individuals in an organization as well as between various work groups in the organization (Allee, 2007). The IS discipline can be considered to include an external-facing value network comprising relationships between an organization and its suppliers, its investors (including venture capitalists); its strategic business partners (e.g., a business with a complementary product); and its customers (Allee, 2007) as well as a cross organizational network of people concerned with improving IS education.

The paper finds traction in the argument that perception of value of IS by the various stakeholders is the antecedent for its relevance. The crisis debate that has been reported in the literature revolving around the traditional disconnect between theory and practice, perhaps points to an unhealthy IS value network, characterized by a value conversion mechanism that is unsupportive of the purpose of the discipline. Enhancing the relevance of IS should therefore focus on ensuring that the value conversion process of the network is in tandem with the values and intents of those who serve the network such as the IS academics, practitioners, and students (under graduate and post graduate). The theory-practice disconnect, as a basis for making an argument for an unhealthy value network has been evident in various research findings.

From an external-facing value network view, academic IS research often fails to address the practical requirements of managers in the business world (Feeny *et al*, 2003), particularly in developing countries where barriers between academia and organisations exist (Costello and Zumla, 2000). IS academic research is also irrelevant to most IS practitioners because it is not based on experience gathered from the business world (Feeny *et al*, 2003). Top ranked journals tend not to be read by executives because they provide little or no insight to their current problems (Paper, 2001). Similarly, McCubbrey (2003) indicates that practitioners are too concerned with other issues, such as demonstrating the value of IS to their superiors to be concerned with rigorous academic journals that contain only a limited amount of relevant information.

Amaravadi (2001) further suggests that IS does not have the knowledge valued by industry and that these problems are embedded in research processes and publications. This is a result of continually shifting resources towards the “hot spots” of the field driven by rewards systems and the need to be recognized as “current” (Amaravadi, 2001). Many universities are not well aligned with business needs due to the difficulty in keeping up with the constant changes in the business use of IS (Sherer, 1999).

From an internal-facing value network view, a key problem facing the IS discipline is that it is perceived by other faculty members still to be about technology and not about adding value to management (Avison, 2003). Elder, Huber, Piercy and Salisbury (2004) state that whilst the IS departments have a distinctive contribution to add to the business core, they are currently not conveying this idea effectively to the other academic units. In addition, Aytes and Byers (2005) state that many students, primarily non-IS, business students, often fail to see the relevance of the content delivered to them by the IS Departments. Thus the value added message about the relevance of IS has not been effectively conveyed to the IS industry, as external stakeholders and to some internal stakeholders, such as students and other faculty. Even though healthy interaction between academia and industry is vital to the progression of the field, the historical tendency not to collaborate has meant that two separate and distinct worlds have been created (Heart and Pliskin, 2001).

In light of emerging and persistent concerns about the relevance of IS, the priority of the stakeholders should be on proving the relevance and value of IS in knowledge production (Saunders and Wu, 2003). The contribution of this research is to bring to the fore argumentation that the relevance of IS as a discipline and practice requires that all stakeholders address the constitution of

valuable knowledge and strategies that can lead to realization of positive perceptions, and thus acceptance of the discipline. The urgency of the resolution of the relevance of Information Systems is therefore structured around the theory of value creation that specifically deifies knowledge and other intangible deliverables (Allee, 2007). A discussion of the theoretical framework is extended and discussed in the next section.

3. DEVELOPMENT OF THE THEORETICAL MODEL

In the process of delivering knowledge to the relevant stakeholders, IS departments, especially in tertiary educational departments, are continuously involved in dynamic exchanges between themselves and other parties. By delivering valuable knowledge to scholars and practitioners, IS academics expect some form of remuneration from knowledge recipients. In order to increase the value of knowledge delivered, different types of knowledge exist with different value potentials. While recognizing various conceptualizations of knowledge types such as explicit and tacit knowledge (Reich, 2000); Gray *et al* (2002) provided a parsimonious perspective which closely linked to the value network orientation of this paper. The four knowledge types conceptualized are: theoretical, ethical (reasoning about value and moral issues), technical (rules of skill or practical know-how) and application knowledge (using the previous three knowledge types in complex real world situations) (Gray *et al*, 2002).

These knowledge types are modelled around a broad-based Value Network framework adapted from Allee (2000, 2007), which models exchanges of value currencies that flow between stakeholders as a result of transactions between them. Allee (2000) identified three currencies of value within the value network that are exchanged through a transaction process between two or more parties;

1. GSR (goods, services and revenue) which are the traditional items usually associated with economic exchanges of value,
2. Knowledge (theoretical, ethical, technical, application) and
3. Intangibles (attitudes, interests, loyalty) which provide benefits and value that can not easily be defined in terms of standard accounting measures.

The two high level stakeholder groups (parties) in this value network framework are those who are considered to provide knowledge (PROVIDERS) who are mainly IS academics, but can also include researchers and postgraduate students; as well as those considered as recipients of knowledge (RECEIVERS) such as IS and Non-IS students and practitioners and other peers and researchers (Figure 1).

Focusing the research from a value network perspective recognizes that a change in the value of knowledge and research from the PROVIDERS to RECEIVERS will impact on intangible (the recognition of the importance of IS, the perception and credibility of the discipline, the general interest in IS and the general attitude towards IS and its participants) as well as the tangible areas within the discipline. The Value Network Framework developed by Allee (2000), models exchanges of value currencies that flow between stakeholders as a result of transactions between them. A Provider supplies a product or service to a Receiver (Customer or user) with additional technical support, personalised service and possibly creates a sense of community. The Receiver in turn pays a fee to the Provider, provides feedback and sometimes loyalty (Allee, 2000).

Modified to fit the IS academic environment, these transactions or exchanges would involve the flow of knowledge and research from IS academics to various stakeholders (IS students, non-IS students and IS practitioners), and in return, receive an inflow of tangible benefits (students fees and

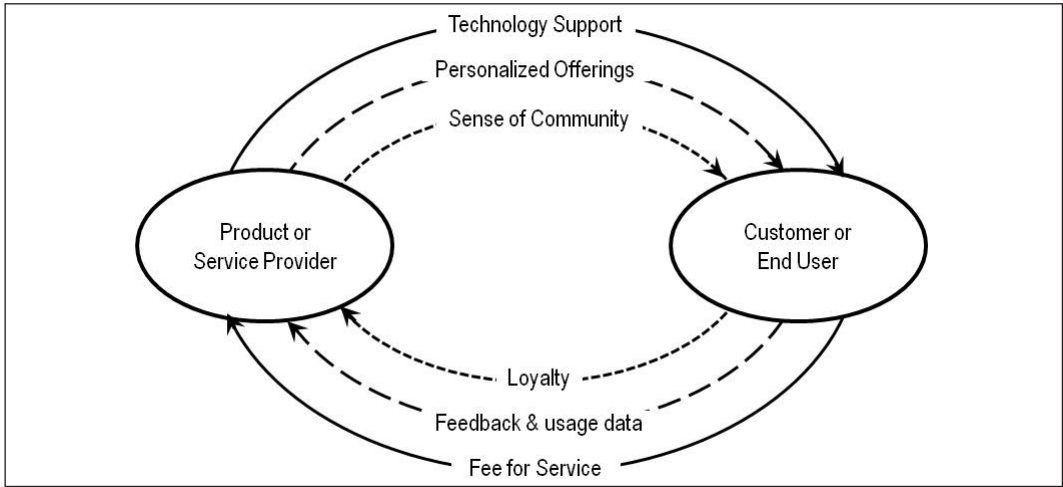


Figure 1: Simple Value Network highlighting the exchange of the 3 value currencies (Allee, 2000).

funds used for research) and intangible benefits such as recognition, respect and credibility. In this way we see that an increase in the value of knowledge and research delivered to these stakeholders could result in a similar relative increase in intangible and tangible value being returned. The adapted framework from Allee’s (2000) model is referred to as the IS Academic Value Network Framework graphically represented in Figure 2.

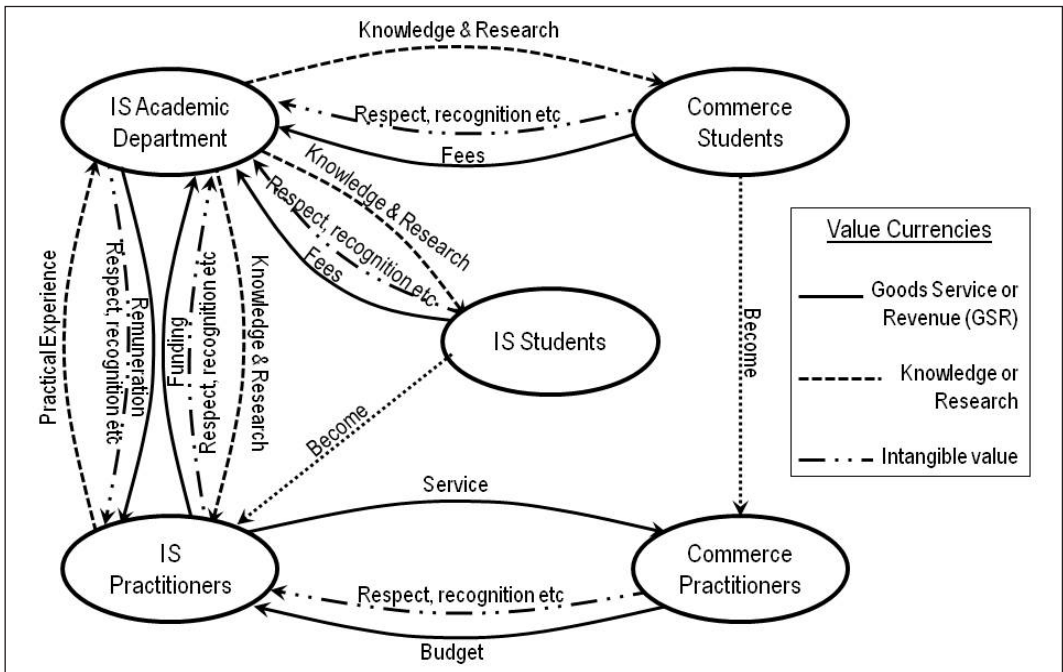


Figure 2: IS Academic Value Network Framework

Therefore based on the above discussions, the primary purpose of this study was exploratory by seeking clarity on the significance of the value creation process as an antecedent in ensuring IS relevance to its community of stakeholders. This purpose is premised on two key propositions:

- That there is a need to significantly change the value of IS knowledge that is delivered to all the stakeholders within the IS community.
- That these changes will result in significant responses, both tangible and intangible, by the receiving stakeholders.

In order to address the above objectives, the following research questions were used as a guide:

- What knowledge type(s) is considered critical by IS stakeholders in South Africa?
- What is the current and future view of IS values?
- Which value creation strategies can be employed to realize the future relevance of IS as a discipline?

4. RESEARCH METHODOLOGY

This section provide a description of the motivation for the research strategy that was adopted, the process of development of the data collection instrument as well as a summary of the demographic information of the respondents. Granted that various research approaches can be employed in exploring value creation, this study adopted a survey research strategy as an appropriate research approach in an exploratory study. A survey approach is necessary in unearthing general views, which can then be employed in subsequent in depth studies using case studies. While individual case studies would provide much more in depth information on the role of value creation in ensuring IS relevance, the issue of IS relevance in a developing country's context such as South Africa, requires a preliminary assessment of its credibility amongst a critical mass of stakeholders for the discipline to gain traction in these countries. Thus a quantitative approach, employing a survey research strategy, typically identified with the positivistic paradigm was therefore adopted in this study.

In order to meet the objectives, the research relied on a questionnaire for data collection (Appendix A contains the questionnaire sent to Academics). The instrument consisted of three main sections: section one was for assessing the stakeholder views on IS knowledge-types as sources of value; section two focused on current and future value of IS, while the last section had items for assessing the value creation strategies.

Reliability analysis was used to assess internal consistency (degree of homogeneity among the items) to identify those items in the questionnaire that had low correlations in order to exclude them from further analysis. This was regarded as an important first step since the survey instrument had not been used before. Landis and Koch's (1977) benchmarks were employed to determine reliability, that is from (a) 0 to .20 as "slightly reliable"; (b) .21 to .40 as "fairly reliable"; (c) .41 to .60 as "moderately reliable"; (d) .61 to .80 as "substantially reliable"; and (e) .80 to 1.0 as "almost perfect" (Landis and Koch, 1977). The overall sample size was 219.

Overall, three items were theorized as indicators of knowledge types, three items as attributed of the current value of IS, eleven items as indicators of future value and ten items as indicators of value creation strategies. A pilot study was conducted to evaluate the effectiveness, layout and validity of the questionnaire. Sample questionnaires pertaining to the relevant groups were given to: 1 IS academic, 2 IS students, 1 Non-IS student and 1 practitioner. This was the most efficient means of gathering the data required from respondents. The quantitative nature of this study allowed for respondents to provide their responses in a manner that could be rapidly collected and analysed. The questionnaires are available on request from the authors.

The IS Academic Value Network Framework (Figure 2) was used to inform the research methodology, and the four value networks involving IS Academic Departments were focused on.

The research required data to be gathered from four groups of IS stakeholders:

- IS Students – classified as those students majoring in Information Systems (IS)
- Non-IS Students – students not majoring in IS but studying a commerce related degree.
- IS Practitioners – people working in a field related to IS, most probably having studied IS or Computer Science.
- IS Academics – people disseminating and creating knowledge in the field of Information Systems at a tertiary institution.

These four stakeholder groups could be divided into two main groups:

- Those who PROVIDE the IS knowledge and research – IS Academic departments.
- Those who RECEIVE the IS knowledge and research – mainly students and IS practitioners.

Out of the Receiving group, the distinction is made between IS Practitioners, who generally receive IS research knowledge, and Students (IS and Non-IS), who generally receive IS academic knowledge.

Questionnaires were emailed to IS students from 2nd year and above from five South African Universities (University of Cape Town (UCT), University of Stellenbosch, Rhodes University, the University of Witwatersrand (WITS) and Cape Peninsula University of Technology). Questionnaires for non-IS students at UCT students were randomly obtained at selected lecture venues or at the computer labs. IS Practitioners (mainly UCT Alumni) were emailed the questionnaire, and were asked to pass the questionnaire on to other practitioners they were aware of. IS academics from UCT, WITS and Rhodes were emailed questionnaires. The three universities have different IS curricula.

5. ANALYSIS AND FINDINGS

The following section reflects on the results of the analysis. The discussions is categorized under the three main themes of perceptions on knowledge types, attributes of IS knowledge and research and value creations strategies.

5.1 Rating of IS Knowledge Types

In order to test that the four knowledge types had been allocated varying degrees of importance, a single factor ANOVA test was conducted and its results were a P-value of 0.00 and $F = 60.11$. Respondents were asked to rate their perception of the importance that IS courses currently place on the four types of IS knowledge (theoretical, ethical, technical and application) (Gray *et al.*, 2003). The results are in Table 1 and Figure 3. IS academics rated theoretical knowledge as having more focus or importance than other types of knowledge. All knowledge types are regarded as important by the IS practitioners, but a special premium is put on application knowledge which received the highest rating by this group.

Respondents from the three stakeholder groups of academics, non-IS students and IS students asked to rate (using a 5 point Lickert scale) the importance that they believe IS departments should be placing on the 4 types of knowledge. The means were then tabulated for the stakeholder groups, for both pairs of data (current and desired) and the mean differences were recorded. These mean differences reflect the level of change stakeholders believe is required from IS departments in the delivery of the four types of knowledge, as shown in Figure 4. An Anova test was conducted on the data, results of a P-value of 0.00 and $F = 13.61$ indicated that the required changes in the 4 types are different.

| Respondents | Rating (Mean) | | | | Standard Deviation | | | |
|---------------|---------------|---------|-----------|-------------|--------------------|---------|-----------|-------------|
| | Theoretical | Ethical | Technical | Application | Theoretical | Ethical | Technical | Application |
| Academics | 4.4 | 2.9 | 4 | 4.1 | 0.5164 | 0.8756 | 0.4714 | 0.5676 |
| Non IS | 3.7 | 3 | 4.1 | 4.4 | 1.0417 | 0.8944 | 0.6747 | 0.724 |
| IS Students | 4.2 | 3.4 | 3.8 | 4.3 | 0.5473 | 0.7837 | 0.8329 | 0.7431 |
| Practitioners | 4 | 4 | 4 | 4.6 | 0.6224 | 0.832 | 0.6224 | 0.5714 |

Table 1: Current Delivery of four Types of Knowledge

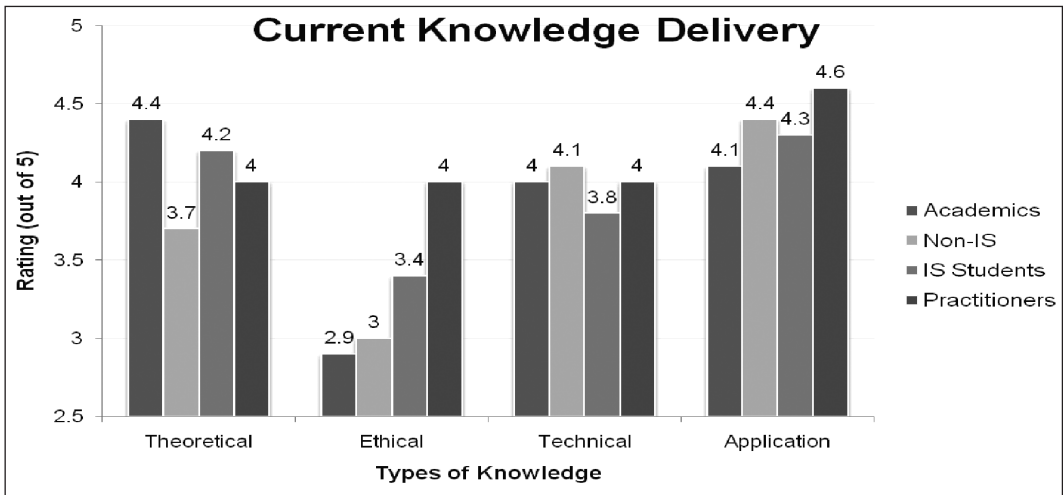


Figure 3: Current Delivery of four Types of Knowledge

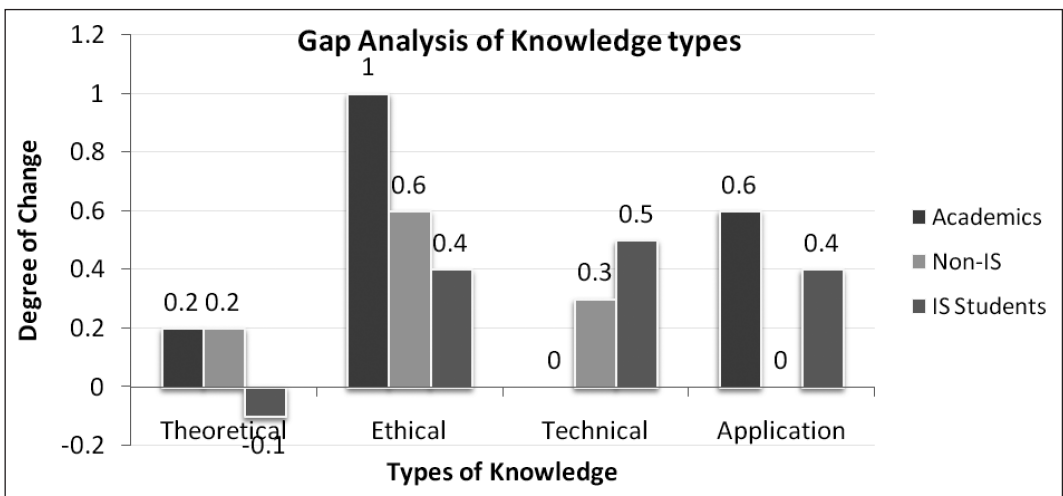


Figure 4: Required Changes for each of the Four Knowledge Types

From Figure 4, ethical knowledge requiring higher levels of change with mean differences of 1.0, 0.6 and 0.4 amongst the academics, non-IS and IS students respectively. Relatively large gaps were also identified for the required changes in application knowledge of IS. One would have expected that as Academics have control over the curricula, they would not have identified large gaps. Individual T tests provided further evidence. The 4 t-values were (-0.4; 6.61; 7.2; 5.74) showing three of the four types have large T statistics as well as highly significant P-values (0.35; 0.0; 0.0; 0.0). Only theoretical knowledge's t-value was not significant, which is a probable indication that the stakeholder groups do not think it needs urgent attention. However, figure 4 also shows that academics currently view technical knowledge as a non critical area for focusing change, yet the IS students generally believe that there should be a focus on it. This may point to a concern on one hand of IS students view that their work roles normally require more of technical knowledge, thus the need to be technically competent.

5.2 Attributes of IS Knowledge and Research

Respondents were then asked to rate the current value on a Lickert scale of 1 to 5 (1 none, 5 very important) of IS Departments in delivering knowledge and research, Figure 5 shows the results. Three attributes of knowledge and research (Saunders and Wu, 2003) are the:

- Uniqueness of knowledge (degree to which it is differentiated from other knowledge),
- Usefulness of the knowledge (the ability to use the knowledge to solve real world problems)
- Transferability of the knowledge (how easily it can be transferred across different mediums without losing any of its value).

It is noteworthy that uniqueness and usefulness follow a very similar pattern with academics and IS students having identical ratings for the two attributes, while apart from non-IS students all have rated transferability lower. Practitioners are slightly more optimistic about transferability of IS knowledge and research value than the IS Academics. IS departments seem to be fairly capable at providing new and useful knowledge to students, but seem to struggle to transfer both academic knowledge and research.

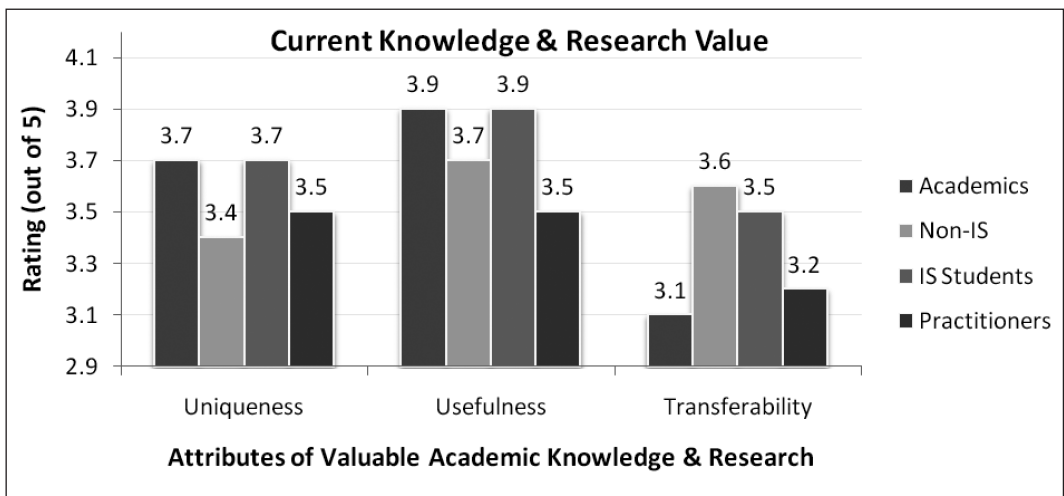


Figure 5: Current levels of Academic Knowledge and Research Value

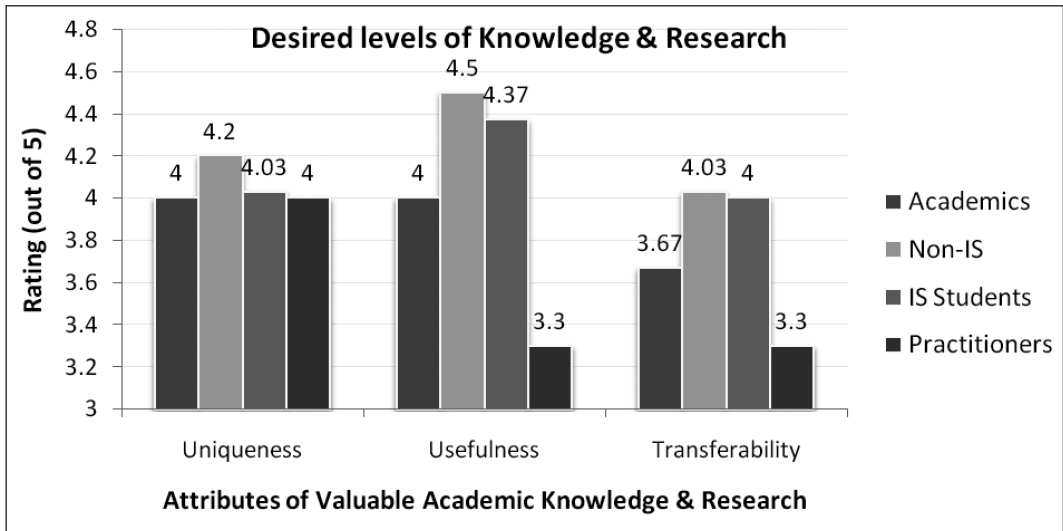


Figure 6: Desired levels of Academic Knowledge and Research Value

Each respondent was then asked to rate, on a scale of 1 to 5, the importance of 9 separate requirements to add maximum value to the students' academic portfolios or the practitioners' places of work. The questions were grouped into 3's, each group relating to one of the attributes of value and the average response per group was used as the preference value for each attribute. The results are presented in Figure 6.

The magnitudes of the means in Figure 6 are noticeably higher than those in Figure 5. The desired levels seem to suggest that the usefulness of knowledge and research is more important, to the majority of the stakeholders, than uniqueness or transferability. Knowledge and research exchange between industry and academia seems to be struggling if one looks at academics and practitioners ratings, and they do not seem to have high expectations for transferability. The uniqueness of knowledge was regarded favourably by the IS practitioners, however, the transferability and usefulness of the knowledge is questionable given the low ratings of 3.3.

The difference between current and desired levels is shown in Figure 7. What comes to the fore is that the usefulness and transferability of current IS knowledge is in doubt from the perspective of practitioners. The low levels of transferability and usefulness may point to a bottleneck in the value exchange process between the academics and the practitioners. The IS relevance question may therefore be partly explained from the weakness of the knowledge of the exchange process.

Transactions between IS academics and the other three stakeholder groups involve the flow of not only knowledge and intangible benefits, also known as the new value currencies or mediums of exchange (Allee, 2000), but also the traditional economic exchanges of value or GSR (goods, services and revenue), as seen in Figure 2. An increase in the value of the knowledge currency might impact the flow of revenue (tangible benefits) from students and industry towards IS departments.

What value could IS departments gain by changing the value given to their stakeholders? Potential benefits can be placed on the framework developed (Figure 2), and are essentially value currencies that could possibly be reciprocated as a result of an increase in the amount of knowledge currency (or value) within the academic transactions between IS departments and students; and IS departments and industry. The weakness of the value creation process as shown by

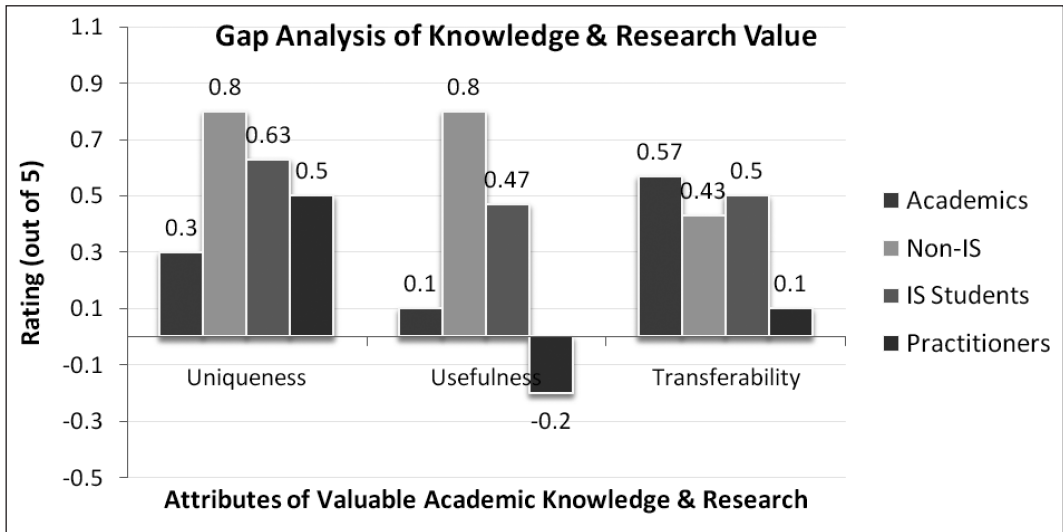


Figure 7: Change in Academic Knowledge and Research Value

the low perception of the usefulness and transferability of the IS knowledge and research. Focusing on the strength of the value creation process will possibly increase the perception of usefulness and transferability of academic knowledge and research, which in effect will result in a greater focus on applicability (application knowledge) of IS. Thus the next part of the analysis focused on the potential value creation strategies that can be employed in strengthening the value creation process.

5.3 Value Creation Strategies

An increase in the value of IS knowledge could potentially result in the increase in the value, and therefore the relevance of IS. Attaining relevance requires using strategies that aid in the process of value creation. Table 2 summarises the results of each of the single sided T tests conducted to test whether or not the consensus of the stakeholders is that a particular strategy has the potential to create significant value for IS knowledge and research and thus be regarded as useful. The results shown in Table 2 shows that five value creation strategies are significantly useful in enhancing IS relevance.

Under the strategy of *targeting misalignment*, the need to align IS syllabus content through a collaborative effort between the academics and practitioners is considered to be a critical strategy in enhancing relevance. Results in this category were a mixture between highly significant and only partly significant. The general consensus is that the onus should be placed upon the IS academics to facilitate collaboration in order to minimise the effects of misalignment in research between academia and industry, rather than on the practitioners. This view is supported by Kohli (2001), Lang (2003) and (Chan, 2001) as opposed to Borchers (2001). The box and whisker plots (Figure 8) of the various value creation strategies also support the discussion that follows.

Accreditation of both academics and practitioners was also considered as a paramount value creation strategy. This is attainable by developing an academic accreditation body for regulating and unifying the quality of teaching and content of the syllabus (7). In addition, there should be an accreditation body targeting prospective and practising IS professionals for standardizing skills levels, development and core practices of IS (8).

| Strategy | | Not Useful | Slightly Useful | Significantly Useful |
|--------------------------------------|--------------------------------------|------------|-----------------|----------------------|
| Core of IS Discipline | 1. Exact Core of IS | | * | |
| | 2. Business Process View | | * | |
| | 3. Practitioner focus | | * | |
| Targeting Misalignment Accreditation | 4. Practitioner collaboration | | * | |
| | 5. Syllabus alignment | | | * |
| | 6. Academic accreditation body | | | * |
| Transfer of Knowledge and Research | 7. Practitioner accreditation body | | | * |
| | 8. Quality knowledge transfer | | | * |
| | 9. Improve uniqueness and creativity | | * | |
| | 10. Espouse the role of IT | | | * |

Table 2: Results of each of the single sided T tests

Table 2 also captures a significant value creation strategy and transfer of knowledge and research. This focuses on knowledge delivery to students that espouses the important role that Information Technologies play in integrating various organizational functions (10). This is also backed by the need to increase the quality of the transfer by improving communication channels (8).

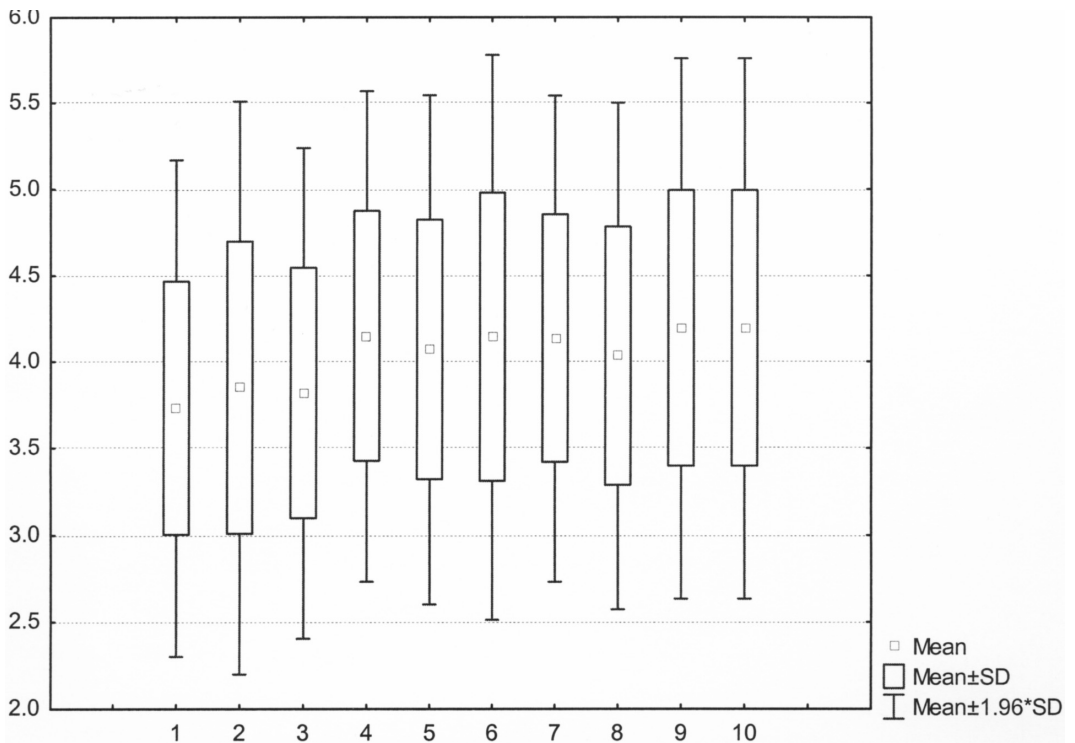


Figure 8: Box and Whisker Plot

| Strategy | Test of Means against reference constant of 4 | | | | | |
|-------------------------------|---|----------|-----|----------|----------|----------|
| 1. Exact Core of IS | 3.735160 | 0.731466 | 219 | 0.049428 | -5.35811 | 0.000000 |
| 2. Business Process View | 3.853881 | 0.844095 | 219 | 0.057039 | -2.56175 | 0.011089 |
| 3. Practitioner focus | 3.821918 | 0.723317 | 219 | 0.048877 | -3.64346 | 0.000336 |
| 4. Practitioner collaboration | 4.150685 | 0.723230 | 219 | 0.048871 | 3.08330 | 0.002312 |
| 5. Syllabus alignment | 4.073059 | 0.750630 | 219 | 0.050723 | 1.44036 | 0.151199 |
| 6. Academic accreditation | 4.146119 | 0.833155 | 219 | 0.056299 | 2.59539 | 0.010090 |
| 7. Practitioner accreditation | 4.136986 | 0.716421 | 219 | 0.048411 | 2.82964 | 0.005095 |
| 8. Quality knowledge transfer | 4.036530 | 0.747190 | 219 | 0.050490 | 0.72350 | 0.470150 |
| 9. Uniqueness and creativity | 4.196347 | 0.797235 | 219 | 0.053872 | 3.64469 | 0.000335 |
| 10. Role of IT in integration | 4.196347 | 0.797235 | 219 | 0.053872 | 3.64469 | 0.000335 |

Table 3: Test of Means against reference constant of 4

It should not be surprising that the final category included two out of the top three means, seen as it was essentially testing for the improvement of one of the three attributes of value with each of the three receiving stakeholder groups (IS majors, Non-IS majors, IS practitioners). Therefore each of the varied suggestions by authors such as, *Audy et al (2005)*, *Aytes and Byers (2005)*, *Beachboard and Beard (2005)*, *Hershey (2003)*, *Lang (2003)*, *Saunders et al (2005)* and *Weinberg (2001)* all may have some merit to facilitating value creation.

Testing of the means of the value creation strategies against a reference constant of 4 reveals that the critical strategies based on p-values that as well as a ranking of means and standard deviations (Table 3).

Using the results of Tables 2 and 3, the significance of the core of the IS discipline is noted as being slightly useful in the value creation process is noted. Overall results in this category suggest that focusing efforts on the issues surrounding the core of the IS discipline, may only be regarded as slightly useful in creating value. All the three strategies in this category received a mean rating that was significant at the 4 point level. This is in line with *Saunders and Wu (2003)*, *Galliers (2003)* and *Robey (2003)* who all state that narrowing the core within the field will not necessarily create value for its stakeholders. Practitioner collaboration (under targeting misalignment) was also captured as significant, but just slightly useful as a value creation strategy.

Both academic and practitioner accreditation were significant and considered to be critical as a value creations strategy. This particular category was the only one to have all of its strategies highly significant at the 4 point level. This may significantly point to a general concern by stakeholders of the fragmented state of the IS discipline, thus need to focus on accreditation in order to provide a unified focus in terms of practice and education.

Under transfer of knowledge and research, the need to improve the uniqueness and creativity of IS delivery was significant and was considered slightly useful in enhancing value creation. Its significant may point to a concern that current modes of IS delivery may not be enhancing adequate transferability of IS skills, and thus the usefulness of IS knowledge in industry. This can also be linked to an inability to adequately demonstrate to students, the role that IT plays in integrating organizational functions. Thus the need to demonstrate the role of IT was considered as significant strategy by the respondents in order to increase the usefulness of IS.

6. CONCLUSIONS

The analysis in this paper shows that a majority of the IS stakeholders, both providers and receivers of IS knowledge, tend to believe that more attention needs to be focused on all of the types of knowledge except for theoretical. More value could be added if the focus is on more application-orientated knowledge which is important in converting explicit knowledge into tacit knowledge i.e. converting facts and theory into analogies, metaphors and simulated real-world experiences.

On the research knowledge side of the framework presented in Figure 2, the results seem to point towards usefulness as the key attribute to focus on, in order to allow IS practitioners to unlock more potential value from IS research. It should be noted that even though uniqueness and transferability are not as keenly targeted for an overhaul as usefulness, they too are seen to be capable of creating value in their own rights. Practitioners will always be scanning the IS community for the most recent and innovative IS research.

Academic IS knowledge on the hand, does not seem to provide a clear cut solution. It seems as if each of the three attributes needs to be targeted but for different reasons. Usefulness, as was the case with the research knowledge, was selected as the most favourable attribute; however it also currently enjoys the position as the best delivered attribute. Uniqueness needs to be addressed because of relatively varied response that it received from the majority of the stakeholders. It was unanimously agreed by all stakeholders that transferability of academic IS knowledge needs to be targeted and improved.

It was also inferred from the findings that a weakness in the value transfer process requires that the stakeholders in the industry focus on certain strategies. What came to the fore was certain value creations strategies clustered primarily around the need to improve the quality of knowledge transfer and accreditation initiatives within the IS sector. The key aspects of the findings of this study indicate a few important lessons regarding value creation to ensure the relevance of IS:

- IS relevance is closely intertwined with various knowledge types and of major priority should be to emphasize applicability of academic and research knowledge. Relevance may therefore be claimed to link to value (current and expected) that arise from the application of IS knowledge and research in practice. The study therefore points out that while there is a continued need to develop theoretical and ethical knowledge, the usefulness of IS finds expression in how it is applied by the practitioners. Thus there needs to be greater focus on packaging IS knowledge in an applicable manner.
- IS relevance can also be enhanced through building quality in the transferability of the knowledge to the various stakeholders that need. Building quality in this process require the adoption of specific value creation strategies highlighted earlier which results in a distinctive discipline whose role in integrating organizational functions should be emphasized.

Thus overall, the main two findings that should be taken away from this paper are summed up as follows. Firstly, there is room for improvement in the delivery of IS knowledge, whether this relates to the general type of knowledge that is delivered or a specific aspect of the knowledge that is delivered. Secondly, the majority of the stakeholder groups seem to be willing to respond to these changes. Their responses might not necessary be universal in their effects i.e. tangible or intangible, however theses actions should nonetheless, according to the data, produce moderately to significantly positive benefits for the IS academic community.

Further research on this topic could see the framework, presented in Figure 2, being extended to include other stakeholder groups within the tertiary environment not to mention the IS field in

general. Such stakeholders within the tertiary institutions include non-IS academics together with faculty management as well as academics and students from other faculties. Stakeholders within the greater IS community could include the government and other corporate IS research institutions.

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APPENDIX A: QUESTIONNAIRE TO ACADEMICS

At which SA University are you currently lecturing IS? UCT / WITS / RHODES

For how many years have you been an IS lecturer? <5 √5-9 10-14 15+

Rate your current position within your IS Department, in terms of the courses that you lecture.

| | | | |
|-------------------------------------|---|--------------------------|--------------------|
| Mostly Development/ Technical | More Towards Development/ Technical | More Towards Analysis | Mostly Analysis |
|-------------------------------------|---|--------------------------|--------------------|

How do you perceive the relative importance placed upon of the 4 types of knowledge below, with regards to the extent to which IS courses CURRENTLY deliver them?

| | Not at all | Hardly Important | Slightly Important | Important | Very Important |
|---|------------|------------------|--------------------|-----------|----------------|
| Theoretical Knowledge | 1 | 2 | 3 | 4 | 5 |
| Ethical Knowledge | 1 | 2 | 3 | 4 | 5 |
| Technical Knowledge | 1 | 2 | 3 | 4 | 5 |
| Application of the Above 3 Types of Knowledge | 1 | 2 | 3 | 4 | 5 |

To what degree of importance do you believe the IS Department SHOULD place upon the 4 types of knowledge that are delivered in their IS courses?

| | Not at all | Hardly Important | Slightly Important | Important | Very Important |
|---|------------|------------------|--------------------|-----------|----------------|
| Theoretical Knowledge | 1 | 2 | 3 | 4 | 5 |
| Ethical Knowledge | 1 | 2 | 3 | 4 | 5 |
| Technical Knowledge | 1 | 2 | 3 | 4 | 5 |
| Application of the 3 Above Types of Knowledge | 1 | 2 | 3 | 4 | 5 |

My current view on the knowledge that students (IS and Non IS) receive from the IS Department (as opposed to other Commerce Courses) in general is:

| | None | Below Average | Average | Above Average | Substantial |
|---|------|---------------|---------|---------------|-------------|
| Degree of Uniqueness (in terms of its content as well as its delivery): | 1 | 2 | 3 | 4 | 5 |
| Degree of Usefulness (in terms of being able to apply it in Industry as well as to other Commerce Subjects) | 1 | 2 | 3 | 4 | 5 |
| Ease of Transferability (from the delivery medium to their understanding and application): | 1 | 2 | 3 | 4 | 5 |

Investigating the Role of Value Creation in Information Systems Relevance

My current view on the research and knowledge that practitioners receive from the IS Academic Department (as opposed to other IS Research Institutions) in general is:

| | None | Below Average | Average | Above Average | Substantial |
|--|------|---------------|---------|---------------|-------------|
| Degree of Uniqueness (in terms of its content as well as its delivery): | 1 | 2 | 3 | 4 | 5 |
| Degree of Usefulness (in terms of being able to apply it in Industry and create value for their organisations) | 1 | 2 | 3 | 4 | 5 |
| Ease of Transferability (from the delivery medium to Industry application): | 1 | 2 | 3 | 4 | 5 |

In order for IS courses, in general, to add value to students Academic Portfolios they should:

| | Not at all | Hardly Important | Slightly | Important | Very Important |
|--|------------|------------------|----------|-----------|----------------|
| Provide new knowledge that has not been taught to the students by other academic departments | 1 | 2 | 3 | 4 | 5 |

In order for IS courses, in general, to add value to STUDENTS Academic Portfolios they should:

| | Not at all | Hardly Important | Slightly | Important | Very Important |
|---|------------|------------------|----------|-----------|----------------|
| Provide the students with new perspectives on the knowledge that they have already learnt from other academic departments | 1 | 2 | 3 | 4 | 5 |
| Provide the students with interesting knowledge | 1 | 2 | 3 | 4 | 5 |
| Provide the students with knowledge that they can apply in the real world | 1 | 2 | 3 | 4 | 5 |
| Provide the students with knowledge that facilitates effective decision making | 1 | 2 | 3 | 4 | 5 |
| Provide the students with knowledge that they can use in other academic courses | 1 | 2 | 3 | 4 | 5 |
| Provide knowledge that is easy to learn and remember | 1 | 2 | 3 | 4 | 5 |
| Deliver knowledge in such a way that it is easy to comprehend or take in | 1 | 2 | 3 | 4 | 5 |
| Deliver knowledge in an interesting way | 1 | 2 | 3 | 4 | 5 |

Investigating the Role of Value Creation in Information Systems Relevance

In order for IS Academics, in general, to add value to the research and knowledge that they provide to the IS INDUSTRY, they should:

| | Not at all | Hardly Important | Slightly | Important | Very Important |
|--|------------|------------------|----------|-----------|----------------|
| Provide new research and knowledge that has not been delivered by other academic disciplines | 1 | 2 | 3 | 4 | 5 |
| Provide new research and knowledge that has not been delivered by the IS discipline | 1 | 2 | 3 | 4 | 5 |
| Provide IS practitioners with new perspectives or insights on research and knowledge that they already have had access to, in the past | 1 | 2 | 3 | 4 | 5 |
| Provide IS practitioners with interesting research and knowledge | 1 | 2 | 3 | 4 | 5 |
| Provide IS practitioners with research and knowledge that they can apply in the real world | 1 | 2 | 3 | 4 | 5 |
| Provide IS practitioners with research and knowledge that facilitates effective decision making | 1 | 2 | 3 | 4 | 5 |
| Provide IS practitioners with research and knowledge that they can use to create value for their organizations | 1 | 2 | 3 | 4 | 5 |
| Provide research and knowledge across mediums that IS practitioners have access to | 1 | 2 | 3 | 4 | 5 |
| Deliver research and knowledge across mediums which allow for it to be easily comprehended or assimilated | 1 | 2 | 3 | 4 | 5 |
| Provide IS practitioners with research and knowledge that is relevant to their purposes and goals in Industry | 1 | 2 | 3 | 4 | 5 |
| Provide IS practitioners with research and knowledge that is rigorous and scientifically sound | 1 | 2 | 3 | 4 | 5 |

Judging from the responses on course evaluations of IS MAJOR courses, the students' perceptions of the current delivery of knowledge by the IS Department has resulted in:

| | Very Negative | Negative | Neutral | Positive | Very Positive |
|--|---------------|----------|---------|----------|---------------|
| Their attitude, in general, towards IS in general being: | 1 | 2 | 3 | 4 | 5 |
| Their attitude, in general, towards the IS Academic Discipline being: | 1 | 2 | 3 | 4 | 5 |
| Their attitude, in general, towards the competency of IS lecturers being | 1 | 2 | 3 | 4 | 5 |
| Their view, in general, of the importance of IS being: | 1 | 2 | 3 | 4 | 5 |
| Their view, in general, on the credibility of IS being: | 1 | 2 | 3 | 4 | 5 |
| Their perception, in general, on the status of IS in comparison to other Commerce Departments being: | 1 | 2 | 3 | 4 | 5 |
| Their interest, in general, in IS being: | 1 | 2 | 3 | 4 | 5 |

Investigating the Role of Value Creation in Information Systems Relevance

Judging from the responses on course evaluations of IS NON MAJOR courses, the students' perceptions of the current delivery of knowledge by the IS Department has resulted in:

| | Very Negative | Negative | Neutral | Positive | Very Positive |
|--|---------------|----------|---------|----------|---------------|
| Their attitude, in general, towards IS in general being: | 1 | 2 | 3 | 4 | 5 |
| Their attitude, in general, towards the IS Academic Discipline being: | 1 | 2 | 3 | 4 | 5 |
| Their attitude, in general, towards the competency of IS lecturers being | 1 | 2 | 3 | 4 | 5 |
| Their view, in general, of the importance of IS being: | 1 | 2 | 3 | 4 | 5 |
| Their view, in general, on the credibility of IS being: | 1 | 2 | 3 | 4 | 5 |
| Their perception, in general, on the status of IS in comparison to other Commerce Departments being: | 1 | 2 | 3 | 4 | 5 |
| Their interest, in general, in IS being: | 1 | 2 | 3 | 4 | 5 |

If the IS Department is able to provide more value in terms of its content and delivery of knowledge, to IS MAJOR STUDENTS, then:

| | Very Negative | Negative | Neutral | Positive | Very Positive |
|--|---------------|----------|---------|----------|---------------|
| Their attitude towards IS in general might become: | 1 | 2 | 3 | 4 | 5 |
| Their attitude towards the IS Academic Discipline might become: | 1 | 2 | 3 | 4 | 5 |
| Their attitude towards the competency of IS lecturers might become: | 1 | 2 | 3 | 4 | 5 |
| Their view of the importance of IS may become: | 1 | 2 | 3 | 4 | 5 |
| Their view on the credibility of IS may become: | 1 | 2 | 3 | 4 | 5 |
| Their perception on the status of IS in comparison to other Commerce Departments may become: | 1 | 2 | 3 | 4 | 5 |
| Their interest in IS might become: | 1 | 2 | 3 | 4 | 5 |

If the IS Department is able to provide more value in terms of its content and delivery of knowledge, to IS MAJOR STUDENTS, then:

| | Very Negative | Negative | Neutral | Positive | Very Positive |
|---|---------------|----------|---------|----------|---------------|
| Their attitude towards IS Academic Research, once they are in the working world, might possibly be: | 1 | 2 | 3 | 4 | 5 |

Investigating the Role of Value Creation in Information Systems Relevance

If the IS Department is able to provide more value in terms of its content and delivery of knowledge, to IS MAJOR STUDENTS, then:

| | Decrease Significantly | Decrease Slightly | Remain the Same | Increase Slightly | Increase Significantly |
|---|---------------------------|----------------------|--------------------|----------------------|---------------------------|
| The actual amount in tertiary fees which go directly to the IS Department eg. Notes Levy, which the students would be prepared to pay for, might: | 1 | 2 | 3 | 4 | 5 |
| The general level of scores that they provide on IS course evaluations might: | 1 | 2 | 3 | 4 | 5 |
| The tendency to for them to recommend IS as a career choice to friends, family and high school pupils might: | 1 | 2 | 3 | 4 | 5 |

If the IS Department is able to provide more value in terms of its content and delivery of knowledge, to IS NON MAJOR STUDENTS, then:

| | Very Negative | Negative | Neutral | Positive | Very Positive |
|---|------------------|----------|---------|----------|------------------|
| Their attitude towards IS in general might become: | 1 | 2 | 3 | 4 | 5 |
| Their attitude towards the IS Academic Discipline might become: | 1 | 2 | 3 | 4 | 5 |
| Their attitude towards the competency of IS lecturers might become: | 1 | 2 | 3 | 4 | 5 |
| Their view of the importance of IS may become: | 1 | 2 | 3 | 4 | 5 |
| Their view on the credibility of IS may become: | 1 | 2 | 3 | 4 | 5 |
| Their perception on the status of IS in comparison to other Commerce Departments may become: | 1 | 2 | 3 | 4 | 5 |
| Their interest in IS might become: | 1 | 2 | 3 | 4 | 5 |
| Their attitude towards IS professionals and the IS Departments in Companies, once they are in the working world, might possibly be: | 1 | 2 | 3 | 4 | 5 |

If the IS Department is able to provide more value in terms of its content and delivery of knowledge, to IS NON MAJOR STUDENTS, then:

| | Decrease Significantly | Decrease Slightly | Remain the Same | Increase Slightly | Increase Significantly |
|---|---------------------------|----------------------|--------------------|----------------------|---------------------------|
| The actual amount in tertiary fees which go directly to the IS Department eg. Notes Levy, which the students would be prepared to pay for, might: | 1 | 2 | 3 | 4 | 5 |
| The general level of scores that they provide on IS course evaluations might: | 1 | 2 | 3 | 4 | 5 |
| The tendency for them to recommend IS as a career choice to friends, family and high school pupils might: | 1 | 2 | 3 | 4 | 5 |

Investigating the Role of Value Creation in Information Systems Relevance

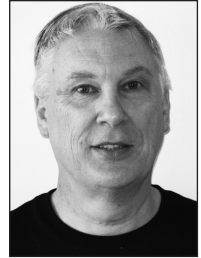
In your opinion, to what degree (if any) would the following strategies improve the perceived value of knowledge or research that the IS academic discipline provides to its stakeholders (IS students, Non IS students, IS Practitioners)?

| | Substantial Decrease | Slight Decrease | Should Stay Constant | Slight Increase | Substantial Increase |
|---|-------------------------|--------------------|-------------------------|--------------------|-------------------------|
| The Core of the Discipline | | | | | |
| To concentrate efforts into establishing an exact core of the IS academic discipline | 1 | 2 | 3 | 4 | 5 |
| Focusing the core of Academic IS more on "systems in organizations", also known as Business Processes and Business Process Management, as opposed to Information Technologies: | 1 | 2 | 3 | 4 | 5 |
| Involving practitioners in the development of a stable, focused IS academic core | 1 | 2 | 3 | 4 | 5 |
| Targeting Misalignment | | | | | |
| Further collaborative efforts on behalf of practitioners to help increase research relevance | 1 | 2 | 3 | 4 | 5 |
| Further collaborative efforts on behalf of IS academics to align the syllabus content with relevant industry practice | 1 | 2 | 3 | 4 | 5 |
| Accreditation | | | | | |
| Developing an accreditation body that academics could align themselves with, in order to regulate and unify the quality of teaching and syllabus content | 1 | 2 | 3 | 4 | 5 |
| Developing an accreditation body that graduating practitioners could align themselves with, to ensure that they are skilled in the core practices of IS and maintain high standards within the practice | 1 | 2 | 3 | 4 | 5 |
| Transfer of Knowledge and Research | | | | | |
| Increase the quality of the transfer of knowledge between industry and academia through improved communication channels | 1 | 2 | 3 | 4 | 5 |
| Improve the uniqueness and creativity of delivery of IS in terms of the way it is being taught to students | 1 | 2 | 3 | 4 | 5 |
| Helping Non IS Major Commerce students understand how business courses fit together and the important roles technology and IS can play in integrating these functions | 1 | 2 | 3 | 4 | 5 |

BIOGRAPHICAL NOTES

Kevin Johnston is an associate professor and head of department of the Department of Information Systems at the University of Cape Town (UCT), South Africa. Before becoming an academic, he worked for 24 years for companies such as De Beers, Liberty Life, Legal & General Volkskas and BoE. He joined UCT in 2001. Kevin's main areas of research are ICT Management, IS Project Management, IS educational issues and Open Source Software.

Neil Botha, Nevashan Pillay and Shane Posthumus were Information Systems students at the time of writing the article. Nevashan Pillay is currently working for Accenture in the Financial Services division as a management consultant, and Shane Posthumus is a software developer for Business Systems Group (BSG) in South Africa.



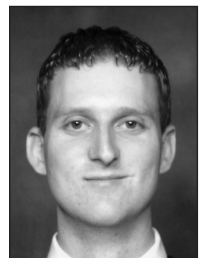
Kevin Johnston



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Nevashan Pillay



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