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Moving Beyond Educational Outcomes for a Major in Information Management: Exploring Strategies for Actor-Network Construction

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Abstract

Developing a curriculum based on an "outcomes-based education" paradigm presents the opportunity to demonstrate how a program of study is of value to business graduates. However, without taking the wider socio-political context of the program into account, a suitable curriculum can be developed which fails to demonstrate value. The first part of this paper reports on the progress of a project that aimed to develop educational outcome statements for an Information Management major in an undergraduate degree offered by an Australian Business School. Using concepts derived from Actor-Network Theory, the project is then examined in terms of how a variety of competing interests might be aligned into a stable network. This analysis contributes to the IS discipline through suggesting alternative strategies for raising the profile of the discipline within the wider community.

Keywords : IS education; Outcomes-based education; Actor-network theory

INTRODUCTION

For well over a decade questions have been asked regarding the nature and role of information systems education in business schools (Markus & Benjamin 1996; Markus 1999; Avison 2003; Petrova & Claxton 2005). With Australian universities bracing themselves in the face of government reforms, student numbers in information systems are in decline and the future direction of the IT industry is unclear. Within the academic discipline itself, debates over an IS core and the relevance of IS research to industry continue - seemingly without resolution. In this environment, it is easy to understand how an outsider (eg a student contemplating their course of university study) might be confused about the potential benefit of a major in information systems. Furthermore, with the financial imperative driving tertiary education in this decade, IS education in Business Schools remains in a vulnerable position.

One approach to address confused perceptions about the value of IS education is to demonstrate to students what skills they will have on the completion of their IS studies. Such an approach is central to the educational paradigm of "outcomes–based education" (OBE). In the first part of this paper, we describe a project aimed at developing "learning outcomes" for an undergraduate major in Information Management (IM). The focus of this major is on developing IS capabilities for business graduates across several disciplines. The objective of the OBE project was to develop a coherent set of outcome statements for the major and its constituent units. At the commencement of this project, it was envisaged that developing outcome statements and integrating them within course materials would assist in demonstrating the value of the major to potential students.

While the focus of the OBE project was the development of outcome statements, the data collected from various sources in the course of the project also allowed for critical reflection on the structure and nature of the unit offerings, as well as the reasons why students choose (or do not choose) to study this major. From these reflections, it became increasingly apparent that simply defining outcomes, adjusting the curriculum and then publicising what students can expect to achieve by studying the major is unlikely to have a significant impact on how the major is perceived. Nor was this likely to demonstrate the value of the major to business students, or arrest the decline in student numbers. The reasons that students choose a course of study, the structuring of degree programs, community perceptions of the industry and job market, and university priorities in the current political context, all contribute to the success of curriculum design. Focussing on the development of outcome statements in isolation to these wider issues does not go far enough in suggesting ways that the implementation of the outcome statements could have positive impact on perceptions of the value of the major.

The traditional view of curriculum development is that it is a linear and rational process through which prescriptions of what is appropriate to be taught are created (Slaughter, 1997). As a way of exploring possible strategies for implementing the OBE project findings, in the second part of this paper we take an alternative approach to this traditional notion of curriculum development. We take the view that the Information Management major is a socio-technical construction embedded within wider socio-technical networks. Through this approach we are able to examine the social and political context in which the OBE project has been conducted and by drawing from Actor-Network Theory (ANT) we use concept of "translation" to discuss how

the interests of various stakeholders (actors) might be aligned to support the goals of the IM major. In particular, we focus on the moment of translation known as "problematization" to develop a scenario that illustrates a possible approach to developing a strategy that addresses broader community perceptions of the value of IS education.

THE OUTCOMES-BASED EDUCATION PROJECT

In 2001 the Academic Council of this Australian University resolved that outcome based teaching would be introduced into the University in the academic year 2004 ahead of the 2005 intake of new students whose high school education was structured around outcomes. All faculties within the University were encouraged to implement the resolution and research grants were made available to stimulate and promote the adoption of outcomes based education. The project described in this paper was supported by one of these grants and focused on developing outcome statements for the undergraduate Information Management major that is offered by the Business School.

The introduction of Outcome-Based Education (OBE) has been met with a mixed response in various educational settings. OBE does however apply a structured approach to the development and implementation of curricula.

> "Outcome Based Education means clearly focusing and organizing everything in an educational system around what is essential for all students to be able to do successfully at the end of their learning experiences. This means starting with a clear picture of what is important for students to be able to do, then organizing the curriculum, instruction, and assessment to make sure this learning ultimately happens" (Spady, 1994, p1) in (Killen, 2000).

These are both laudable and achievable sentiments but require a different mind view of teaching and learning in higher education. As with most university courses, listing unit objectives in course outlines is standard practice at this university. The next step in outcomes–based education however involves relating those objectives to what students can do after graduation (outcomes), as a result of taking specific units. Ensuring that the outcomes from each unit are compatible and complementary with those of the other units in the major is further progression towards a coherent and effective educational system. At a detailed level, identified outcomes are also linked to methods of instruction and assessment.

The project described in this section aimed to take a first step toward developing and OBE approach toward the teaching in an undergraduate major in Information Management by developing outcome statements for the major overall and each of its constituent units.

OBE and the Information Management Major

The Business School awards two undergraduate degrees, a Bachelor of Commerce and a Bachelor of Economics. Students of both degrees must satisfy the requirements for at least one major stream of study and most students graduate with two or three majors. The Information Management (IM) major has been developing over several years and was most recently reviewed in 1998. When it was originally introduced as a major in 1993, the overall emphasis of units was toward management science and business statistics. The flavour of the major has since evolved to include more IS-related studies including systems analysis, database management, IS management and introductory programming. While the units within the major are not specifically driven by curricula recommended by professional and teaching bodies, recommendations of several bodies (ACM, AIS, & AITP, 2002; ACS, 1997; IRMA & DAMA, 1997) have been used as a cross check and confirmation on what is appropriate within the major.

Given that all majors within the Business School are constrained to six, single-semester units, a full IS program aimed at developing skills of an IT professional has not been the primary objective of the course developers. Rather, it has been the intention to develop a major that encompasses a range of units from the use of statistics to support decision making, through to systems development and social implications of technology adoption. The emphasis has been on developing the IM major as a second major to student's primary choice (be it accounting, marketing, management, etc). This is in line with the concepts of "IT-enabled management" (Wysocki and DeMichiell 1997), "hybrid managers" (Currie and Glover 1999) and reflects the changing nature of the information systems function in organisations (Feeny & Willcocks, 1999).

While the IM major is a relatively small program within the School, it has over the years met with a certain degree of success and has been popular amongst students with a business interest in information technology as well as students of accounting, finance, management, marketing and economics who see it as a valuable complement to their primary interest. Students from the Faculty of Computer Science are also attracted to the Information Management major as they see it as providing a business orientation to their otherwise technically-oriented degree.

Enrolments in units in the IM major have however fallen significantly since 2002. While the decline in interest can be seen as a reflection of the national trend in IT education, anecdotal evidence suggests that prospective students do not recognise the value of an IM major as they cannot easily see how a major in Information Management translates into employment prospects as represented by job advertisements. The University's resolution to move toward an OBE paradigm was therefore recognised as an opportunity to review what is taught in the Information Management major and to document this in terms of the desired outcomes – sometimes referred to as 'exit outcomes' (Spady, 1988). The intention was to use the IM major outcome statements as a vehicle to establish outcome statements and competency scales for each of the units within the major. Outcome statements at both the major and unit level, would provide both staff and students with a much clearer idea of what graduates will be able to do as a result of completing an IM major and it was felt that this would contribute to making the major more attractive to potential students.

OBE Project Methodology

In theory, curriculum should be developed from outcomes not vice versa, but with units and teaching in place it would be naïve to adopt a green fields approach. Therefore, the approach taken to developing the exit outcomes was to use the existing units and their associated objectives as a starting point for the OBE exercise. Stakeholder input is important to curriculum development (Petrova and Claxton 2005) and therefore it was decided to examine offerings and from the perspective of three major stakeholder group – unit co-ordinators, employers and students. Given that the nature of input from each stakeholder group would be different, multiple methods were used in the analysis and these are summarised in Table 1.

Unit co-ordinators have perhaps the most tangible stake in the development of teaching and learning outcomes. The first line of attack therefore, was to explore the content and objectives for each unit. Through in-depth interviews with each unit co-ordinator we examined the rationale for their unit within the context of the objectives of Information Management major and with respect to the other units in the major. Because we needed to deeply probe how they understand what they teach, their motivations for doing so, and what they believe that students learn, we drew on the method of triads from the RepGrid methodology (Fransella & Bannister, 1977). By asking the interviewee to consider units in groups of three and to identify aspects of commonality between two of the units that is not shared by the third, we were able to qualitatively develop constructs that formed the basis of unit outcomes.

The second stakeholder group that is likely to have a strong influence on outcomes are the potential employers of our graduates. Research has previously shown that there is frequently a gap between employer perceptions of graduate capabilities and the actual competencies of graduates (Trauth, Farwell, & Lee, 1993; Tye, Poon, & Burn, 1995). While our intention was not to replicate large scale studies of employer perceptions, we did feel that it is necessary to develop outcomes in line with what industry and businesses are looking for. Given the nature of the course, graduates with an IM major can commence work in a variety of technical and non-technical jobs (eg programmer if the degree is Computer Science; management for Commerce degree with majors in Human Resource Management or General Management; or finance Commerce degree with Accounting or Finance.) Furthermore, the value of the IM major sometimes does not emerge until some industry experience has been gained and the graduate can move into such positions as management consultant or business analyst. Therefore, to gain an initial appreciation of the types of skills that are associated with job titles, we sampled and analysed the stated requirements of job advertisements from a range of sources including both national and South-East Asian print media, as well as, online recruitment websites over a two week period. To expand on our understanding of employer requirements, we also conducted in-depth interviews with human resource consultants and executive recruitment agents. These interviews confirmed that as intermediaries between universities and employers, the employment agents had a wider view of what skills/ knowledge/ experience are valued both by employers of new graduates as well as those required for later career moves.

Stakeholder Group	Objective	Data Collection Technique
Lecturers	Identify and explore perceptions of what is currently taught and how that contributes to the major	Semi-structured interviews with lecturers using Rep-grid technique.
Employers	Identify the outcomes expected by prospective employers	Survey of IS-related job advertisements In-depth interviews with employers and recruitment agents
Students	Identify and explore student expectations of outcomes and their reasons for choosing/not choosing the major	Focus groups with current undergraduate students

Table 1: Data Collection techniques for Stakeholder Groups

It could be argued that students are not sufficiently informed with respect to which outcomes are of value to them for their views to be a significant factor. In contrast, we believe that to be effective, the outcome statements we produce must reflect the criteria that undergraduates use to choose their degree and majors. At the very least, the expression of the outcome statements must be easily accessible to young people, particularly in language and emphasis. This study therefore required exploratory qualitative research to gain an understanding of the attitudes and perceptions of the target population prior to any statistical testing with a survey. Because of their utility in gathering opinions and experiences we used focus groups of current students to explore salient attributes when selecting a major as well as the specific outcome expectations from undertaking an IM major.

OBE Project Preliminary Findings

The preliminary draft of outcome statements for the major were based largely on the results of the interviews with unit co-ordinators. However, the process of developing and verifying the outcome statements involved the principle project members iteratively reflecting on the wide range of data collected, seeking feedback from unit coordinators and examining the derived outcomes in the wider context of the university's outcome statements. A recent draft listing of outcomes for the IM major together with some example unit level outcomes (outcome statements for the degrees have yet to be developed) are shown in Table 2.

IM Major Level Outcomes	Unit Level Examples
Use and direct the use of appropriate information and communication technology in business contexts	Design and manipulate Excel spreadsheets to compute typical business matters
Monitor and control the strategic roles of ICTs in all aspects of business	Recognise opportunities to apply ICT to new applications
Manage information systems development projects	Prepare a cost-benefit analysis for a proposed IS
Analyse the information, processing and technical requirements for systems that manage the knowledge on which a business depends	Model the activities and dataflows in a business process using CASE tools
Translate user requirements into design specifications for information systems	Evaluate alternative IS design proposals
Procure and integrate application software into business processes	Prepare a request for proposal/ quotation
Evaluate critically the business implications of changes and trends in the ICT industry	Apply an ethical framework to consideration of the impact of ICTs
Communicate in writing and orally about business and technical issues	Use the language and terminology of ICT correctly and freely
Use data and information to develop solutions to business problems	Make a decision based on a rational analysis of costs and benefits
Work effectively individually and in a team	Manage time commitments, learning strategies and participation requirements

Table 2: Outcomes of the IM major with unit level examples

While the development of major-level and unit-level outcome statements was the main focus of the OBE project and formed the primary deliverables, implicit project objectives related to clarifying the value of the major to potential students, demonstrating its relevance and raising its general profile within the degrees. As discussed previously, rather than aiming to develop an archetype "IS Professional", the IM major has been developed as a second major that provides an IS perspective to student's other interests and an emphasis is placed on developing capabilities that bridge the gap between knowledge of the "business" and technical expertise. The thrust of this approach to IS education within the IM major was examined and was by and large confirmed in the data collected from each stakeholder group. However, our data also confirmed that the underlying philosophy and ideals of the major were not made clear to outsiders and nor was it an easy message to impart.

The obvious difficulty arising from taking such an approach is that there is no defined career path that graduates can subsequently point to and follow. Our analysis of job advertisements aimed to provide some orientation regarding job titles and skills relevant to graduates of the Information Management major. So rather than specifically searching for job titles such as systems analyst or IT manager, we broadened our search to include analysis of job titles that had a different professional focus (eg Market research analyst, accountant, business analyst etc.) Within those advertised positions we then looked for IS–related capabilities and in particular those capabilities that related to the proposed outcomes of the IM major. While we found a vast array of job titles that had relevant job descriptions associated with them, the breadth and generality of these descriptions confirmed our suspicion that that there is no clearly defined job title or role for which Information Management graduates could identify and apply.

Our interviews with HR consultants also painted a confusing picture of what types of IT-related skills industry is looking for. It is almost a truism that employers are looking for graduates who have a blend of technical and business skills. However, it appears that those companies hiring IT personnel look first to the technical strengths (eg Java programming) and then examine the "soft skills". From our analysis it appears that although employers want a blend of soft and technical skills, the balance between the two is difficult to evaluate and subsequently no clear picture of employer requirements emerged.

The student focus groups explored several issues related to the IM major, including their reasons for choosing (or not choosing) majors, their perceptions of learning outcomes, as well as their general satisfaction with the major. These focus groups were enlightening on many issues. Of particular note for this discussion was that there was a general recognition that students in the IM major do see synergies with their other major courses of study and in general feel that IM major outcomes will be important in their careers. While this was the case, in the course of their studies students did not necessarily relate what they were learning to the outcomes that they agreed were important.

Critical Reflections of the OBE Project

The OBE project for the IM major has produced a set of outcome statements for the major and it is possible to relate each of the units within the major as contributing to one or more of these outcomes. The project has also raised awareness of the OBE paradigm within the IM discipline group. In this sense, the project has been successful. In addition, by exploring student and employer perceptions it has been possible to make some recommendations about how outcomes-based education paradigm can be used to improve the profile of the IM major and to make it more attractive to students. From a marketing perspective, the research conducted for the OBE project identified shortcomings in how the IM major was presented to students and several eminently applicable suggestions for increasing awareness of the IM major in the marketplace were made by the market researchers who were contracted to conduct the student focus groups. On the face of what was produced in the course of the OBE project, it would seem that we could be justifiably satisfied. However, what became even more apparent in the course of the project was that raising the profile of the major and demonstrating its value to those outside the immediate discipline group (ie prospective students and employers) is problematic.

It would seem that for students and employers both to accept the vision of the IM major as providing the bridge between business and technical expertise and being valuable for our graduates, simply tinkering around the edges of promotional materials would not be sufficient. Merely integrating outcome statements into course outlines or even completely adopting an OBE paradigm is likely to have only a minimal impact on student perceptions of the value of the major and subsequent enrolments. If we want students to accept that an IM major within their degree will equip them to become business professionals capable of using and leveraging IT in support of their organizational activities, strategies that go well beyond promoting the value of unit outcomes to potential students are required. We need to think in terms of how the prevailing expectations and beliefs about studies in information management can be altered. This requires a very different way of thinking about how we develop and market our curriculum to that driving the OBE project. In order to explore some possible strategies, the remainder of this paper uses a framework based on Actor-network theory (ANT) to analyse the IM major and the OBE project in greater depth.

ACTOR-NETWORKS, THE IM MAJOR, AND THE OBE PROJECT

Actor-network theory has received a great deal of attention in the IS discipline in recent years as it promises a much needed alternative perspective to the dominant deterministic view of information systems within organisations (eg. Walsham 1997; Orlikowski & Iacono 2001; Ciborra 2000). We believe that insights from ANT can also be usefully applied to understanding how IS curricula are developed as well as suggesting how curriculum designers can influence the trajectory that the design of curriculum takes.

Typically, the development of any curriculum is viewed as part of a linear and rational process which becomes a prescription for what must be learned in order to achieve proficiency in a subject (Slaughter 1997). However, curriculum development can also be viewed as a cultural and political construction in which case the curriculum is an expression of "problems, debates, and topics that make an impact on practice" (Karseth 2004:638). Our approach to the OBE project took the former, traditional perspective. While efforts were certainly made to incorporate the perspectives of relevant stakeholders in the development of the outcome statements for the IM major, these perspectives were treated purely as input to the development of a product. We were not concerned with examining the socio-political context of the project, nor how this context was involved in shaping the content and perceptions of the major.

As an alternative to the linear approach, it is also possible to take a social constructivist perspective to analyzing the IM major and the OBE project. One of the principle tenets of ANT is that both people and things are considered actors in an actor-network. In taking this stance, a network is "…a set of relations between an actor

and its neighbours on one hand, and between those neighbours on the other" (Lea et al. 1995) and we are concerned with how this set of heterogeneous actors interact and negotiate arrangements to achieve a stable network of aligned interests. Actors can participate in many networks which frequently overlap and sometimes compete with one another. In our analysis the IM major and its context consists of a heterogeneous mixture of technical and social elements which mutually elaborate each other. Therefore, following Mulcahy (1998) we can conceive of the IM major as a socially constructed technology (Grint and Woolgar 1997). Using this approach we are able to examine the social and political context in which the OBE project has been conducted and by using the ANT-related concept of "translation" we can begin to examine how the interests of various stakeholders (actors) might be aligned to support the goals of the IM major. In doing so, we suggest that the process of aligning the interests of various actors will lead to a wider recognition of the value of the IM major.

ANT and Moments of Translation

Actor-network theory is an approach that sets out to explain the development and stabilization of forms of technology. It is concerned with the sociology of translation (Callon 1986) and focuses on the social construction and alignment of interests of *heterogeneous* actors. It aims to describe the negotiations between actors (*actants*) in the progressive constitution of the network. Stability and social order are achieved through the continuous negotiation of interests. *Black boxes* are created when "many elements are made to act as one" (Latour 1987:131). The most important negotiation process is known as *translation* in which the actants construct common definitions and meanings, define representatives, and co-opt each other in the pursuit of individual and collective objectives (Bardini 1997). In the translation process designers or innovators will *inscribe* their vision of the world into technical content of objects (Akrich, 1992).

As outlined in previous sections, the IM major has been developed with an eye to the changing role of IT within organizations and as an adjunct to other majors in the degree, it aims to bridge the gap between IT specialists and business. As has been revealed in the OBE project however, this approach has led to a perceived lack of clarity regarding the possible benefits for students completing the major. In the parlance of ANT, the interests of powerful and relevant actors have not been inscribed and black boxed into a stable network. The OBE project focused on developing an output for integration into existing curriculum materials. It did not take into account the process of interest alignment and ignored the process of translation. To further our analysis and explore strategies to realise the vision of the IM major as a desirable and suitable course of study for students in the Business School, we use the moments of translation as described by Callon (1986). Given that we are at this stage simply exploring possible strategies, we focus on the initial stages of translation and develop a scenario that provides direction to strategy formation.

The process of translation moves through four stages (Callon 1986; Harrison & Laberge 2002). The first stage known as *problematization* involves formulating a problem and proposing solutions. *Interessement* is defined as a set of actions by some key actors that impose on other actors the promotion of given goals and objectives. During this phase, the key actors try to isolate the actors they wish to enroll from others who may have alternative solutions to the problem. The key actors are trying to build alliances and destroy competing associations. The third phase of *enrolment* involves the distribution and assignment of roles in the network and is really the outcome of successful interessement. It is that point in the translation process that actors consent to giving commitment to the network. The final stage of *mobilization of allies* is the stage where the network either becomes irreversible or begins to fall apart if it cannot sustain the interests of everyone.

EXPLORING STRATEGY THROUGH TRANSLATION

In order to explore possible strategies that will both reverse the decline of enrolments in the IM major and develop its external profile, we explore the interests of actors who have a stake in the IM major by referring to Callon's (1986) account of the attempts of marine biologists to develop a conservation strategy for a population of scallops in St. Brieuc Bay in France. While a typical analysis of the moments of translation is through empirically tracing activities of actors in an historical sense (eg Graham 1998; Harrison & Laberge 2002), our analysis takes on a forward looking perspective and aims to develop possible strategies for raising the profile of the IM major (Sidle & Warzynski 2003). Given that we are in the early stages of developing strategies, our analysis concentrates on the moment of problematization.

Problematization involves constructing the space in which alliances between actors are formed. These alliances emerge when a problem solution is seen to be significant to actors. Callon's analysis of the scallops in St. Brieuc Bay tells the story of how the goals of actors are framed in terms a solution proposed by the actors who actively try to develop alliances (the *primum movens*). The alliances are formed by framing the goals of each actor in such a way that the proposed solution becomes an *obligatory passage point* through which the actors must move in order to achieve their goals. Obligatory passage points are formed when obstacles are shown to exist between the actors and their goals.

Relevant Actors, Interests and Goals

Our first task in this analysis is therefore to identify and examine the goals and interests of actors relevant to the IM major. On the surface, the IM major is a grouping of individual units of study which are related to one another through the administrative rules of the university. The contents of the units that contribute to the major have been developed by a relatively stable group of unit co-ordinators and evolved in line with the generally agreed sentiment of developing capabilities for IT-enabled managers. Whereas the OBE project developed outcome statements for the major through analyzing three stakeholder groups – unit co-ordinators, prospective employers and students, an ANT-based analysis forces us to think differently about relevant actors, their interests and their goals. Actors can be human or non-human, and rather than viewing the context of the IM major as comprising external forces influencing the major, the wider context becomes part of the network in our analysis. Therefore in this analysis, the *primum movens* (ie the entity driving the negotiation of interest alignment) is the OBE project itself. Inscribed into the project objectives is the goal of reversing declining student numbers by enhancing the major's profile within the Business School's undergraduate degrees and the wider business education community. Below we discuss the actors whose interests need to be aligned with those of the OBE project. These actors and their goals are depicted in Table 3.

As described previously, the IM major is only one of several majors that can be taken by students in the Business School. The Business School degree structures can therefore also be seen as a critical actor that needs to be aligned with the interests of the IM major. Although essentially a zero-sum game, there is a hidden competition for student numbers between the various discipline groups within the School. The regulations that govern unit enrolments and subsequently define the majors have been negotiated over time by discipline heads and school administrators. The long-held definition of required first year units however, privileges some majors over others. For example, marketing has no first year offering at all and although there is a first year introductory IS unit, it is not required by the degree. Consequently, this unit attracts only students who perceive that they require a basic grounding in IS. This unit is a pre-requisite for completing the IM major and so in order to have a constant flow of students through later years, it is imperative that the first year unit attracts high numbers.

The B.Com degree rules do however promote multiple majors to students. Completion of a major requires only six second and third year units and some units contribute to more than one major Consequently, most students complete at least two majors and it is even possible for three majors to be completed within the three year degree. The IM major has leveraged the opportunities provided by this degree structure and three units which can contribute to the IM major contribute also to three other majors (Accounting, Marketing & e-Business).

The second set of interests that contribute to the context of the IM major are associated with the university-wide teaching and learning network. As with most Australian universities, teaching and learning issues are being given high priority by university administrators. With increasing pressures on universities through decreased funding and the demands of students who are asked to contribute wholly or in part to the cost of their education, there are greater demands on universities to demonstrate the quality of the teaching they provide, as well as needing to become more accountable for the income that they get for teaching. At this university, Outcomes Based Education is seen as a major initiative designed to demonstrate the quality of teaching and learning. The grant that funded the OBE project that examined outcomes for the IM major was awarded by the university's teaching and learning committee and was the first OBE project undertaken by the Business School. Aligning the IM major with the teaching and learning network is a way of promoting visibility of a relatively small program of study within the university.

A central argument of the approach taken in the IM major outcomes has been that IS capabilities can be beneficial to graduates if they are developed in conjunction with other business-related disciplines. A third actor of relevance is the IS community within Australia. The academic IS community has developed significantly in Australia over the past ten to fifteen years. The annual ACIS conference, the formation of the Australian Council of Professors and Heads of Information Systems (ACPHIS) and the Australian chapter of the AIS are testament to a burgeoning maturity of the discipline in the Australian universities. It is in the academic IS community that debates over the appropriate core of the discipline rage, research is conducted into appropriate skills for IS professionals, and curriculum recommendations are made.

While the organization of the discipline has matured within Australia, the view of an IS-related major as being merely an adjunct to other business studies rather than promoting IS as a core business activity may not be readily accepted by institutions that offer programs aimed at developing the capabilities of the archetype IS professional. A challenge for the IM major is to enrol the interests of the academic IS network into the proposed trajectory for the IM major.

Potential employers are obviously relevant actors. However, we need to ask who the relevant representatives of this diverse group are. Because the IM major does not aim to fully develop the capabilities of the archetype IS professional, the traditional destinations of IS graduates in the IT industry are not appropriate. Therefore,

industry oriented professional bodies such as the ACS and AIIA are also likely to have a tangential an interest in the capabilities of business-oriented IM graduates. As borne out in the OBE project, while there is common agreement that blending business skills with a knowledge of information systems is an appropriate skill set for organisations in the 2000s, employers find it difficult to articulate a career path that meets that skill set. Perhaps even more important than aligning the interests of IT industry groups and employers with the interests of the IM major, the enrolment of professional bodies and industry groups that represent the employment destinations of the wider body of business school graduates also need to be addressed (eg Institute of Chartered Accountants, The Market Research Society, etc.).

In terms of reversing the declining level of enrolments in the IM major, students are the critical actors whose interests need to be aligned. It is more difficult however, to think of students as a network because they are drawn from a variety of backgrounds and nationalities. In the mix of students who currently pursue the IM major, approximately 40% are international students and about 30% are computer science students who enroll in the IM major across the faculties. The focus groups conducted in the OBE project suggested that other than salary expectations and future career options, personal interest in the subject matter and synergies with other majors were the main drivers behind students' choice of major. Although not one of the major drivers of choice, another significant factor borne out in the focus groups was the influence of friends and peers. It was apparent from our study however that students either have a prior interest in doing an IM major or they barely give it a thought – preferring majors in accounting, marketing and management where career paths and salary expectations are relatively clear. Rather than thinking of potential students as a homogenous group, it is perhaps more fruitful to examine them in terms of cohorts (eg international students studying computer science, local students majoring in accounting, etc). Such an approach would help in identifying the interests of each cohort prior to alignment efforts.

Actors	OBE Project (*Primum movens*)	Business School Degrees	University Teaching & Learning Committee	Academic IS Community	Employers	Students
Obstacle		Knowledge of IT is essential for business school graduates	Low commitment to OBE by faculty	Demonstrating relevance of IS education is difficult	Unclear career paths for IT-enabled management	Business IS degrees do not lead to good jobs
Obligatory Passage Point	*The outcomes of an IM major are beneficial to developing the necessary IS-related capabilities for business professionals*					
Goal	Increase enrolments in the IM major	Provide relevant, respected degree to attract high quality students	Demonstrate quality teaching and learning environment	Nurture discipline and develop academic credibility	Employ graduates who have capacity and capability to use and apply ICT in their work	Get a degree that enables a fulfilling and well paid career

Table 3: An Obligatory Passage Point for Promoting the IM Major

Defining an Obligatory Passage Point

Each of the relevant actors identified above have quite different long-term goals. Drawing from the concept of problematization, the task of the *primum movens* is to align the interests of each actor by becoming significant in the achievement of their long-term goal. This can be done by defining an obligatory passage point that is relevant to each actor and to identify obstacles to their goals that forces them to take this (obligatory) trajectory. The scenario depicted in Table 3 defines an obligatory passage point for all actors by framing the problem in terms of the educational outcomes of the information management major. Obstacles to each actor's goals can be identified accordingly. For example, if the goals of employer groups can be defined in terms of the need to employ IS-enabled personnel and it can be demonstrated that there is an unclear career path for IT-enabled managers, they may become enrolled into the network by accepting that the educational outcomes of the IM major will overcome this obstacle. Similarly, an obstacle to the Business School degree's goal of providing a relevant degree that attracts quality students, might be that knowledge of IT is critical for the modern business professional. It is therefore necessary that for the degree to pursue its goal it must align with the IM major in

promoting the argument that the outcomes of the major are beneficial to developing the IS-related capabilities of business professionals.

Developing Strategies for Aligning Network Interests

What has been outlined above is an alternative way of thinking about how curriculum is developed and implemented. By framing the OBE project within the wider social and political context and using the moment of problematization to identify the key actors, their interests and goals, some preliminary tactics that can form the basis of strategy for the IM major development are suggested. While a full discussion of these is beyond the scope of this paper, an exposition of strategy could include exploring alternative solutions to the framed problem and any tactics that might ensure that ties to these other solutions are diminished (Law, 1992). Furthermore, examining how the interests of the IM major can be made durable by inscribing them into material artifacts (eg texts, websites, degree regulations etc) could provide focused recommendations for stabilising the alignment of actors.

In a discussion of ANT and strategy, Law (1992) notes that *"there is more than a hint of Machiavelli in the method"*. From our encounter with a wide range of issues in the conduct of the OBE project and our reflections on its progress, it became clear to us as course developers concerned with the status of IS education, that significant change was not going to be made by merely revising the curriculum and tinkering with promotional material. It is apparent that the social and political context of the IM major needs to be actively engaged with and the alignment of key stakeholder interests needs to be actively encouraged. Consequently, the Machiavellian undertones inherent in an ANT- based analysis are considered to be highly appropriate.

CONCLUSION

The OBE project described in this paper was largely driven by falling enrolments and the perceived confusion in the wider community regarding the longer-term value of the IM major. While the project was successful in terms of refining and clarifying the curriculum, this in itself was considered to be insufficient. We have therefore suggested that ANT can provide an alternative approach to thinking about how wider community perceptions about the nature of IS education can be changed.

Developing and successfully implementing a strategy based on an ANT analysis is a much larger and more difficult undertaking than that attempted in the original OBE project. However, in this paper we have aimed to demonstrate that such an approach will at the very least be more effective in addressing broader community perceptions of the value of IS education than an isolated analysis of what it is that an IS education is expected to deliver.

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