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## **A Theory of Change Framework for Developing Cross-Faculty Programs: An Information Systems Perspective**

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### **Abstract**

*Information systems (IS) is a discipline that draws upon many other disciplines to bridge theory and practice and address the information and knowledge needs of individuals, organisations and society. We propose that an ideal education in IS would be delivered via cross-faculty programs of study that are not combinations of units from different faculties and disciplines, but programs which include a coherent and cohesive set of units co-designed and co-delivered by teaching staff from more than one faculty. This allows students, and teachers, to appreciate the different content and perspectives within the same context, as they will experience in the workplace, and allow them to develop deeper understandings of the complexity that can arise in their roles as mediators and communicators in finding appropriate IT solutions. Such a model poses a radical change, and thus the framework we offer uses a ‘theory of change’ agenda.*

### **Keywords**

Information systems curricula, theory of change, cross-faculty programs of study.

### **INTRODUCTION**

Cross-faculty degrees and majors are not common. While many degrees or majors may offer the flexibility for students to take electives or core service units in other faculties, rarely the whole program of study, such as the degree or major, has been designed and delivered as a joint effort with shared goals by multiple faculties. Cross-faculty collaboration can “inspire different forms of listening and speaking, and lead to unimagined collaboration possibilities for learning, teaching, and research” (Bohen & Stiles, 1998, p. 1). The need for cross-disciplinary units in Information Communication Technology (ICT) has been recognised in the development of single units such as “web design” or “game design” involving multimedia lecturers from the Arts Faculty and technology lecturers from faculties such as Business, Economics, Engineering or Science. For units such as Human Computer Interaction or Usability Engineering it may be appropriate to also include lecturers from Psychology departments. However, we propose that for Information Systems (IS) students there is a need for a more extensive, integrated and collaborative cross-faculty approach to deliver a high quality program of study due to the diversity and complexity of the knowledge and skills (Paul, 2002) that need to be acquired.

To avoid confusion over the use of the terms unit, subject, course and program, in this paper we will use the term program [of study] to refer to a combination of units that must be satisfactorily completed to qualify for an award, such as a degree. We will also consider a major to be a program of study, though it represents a subset of the whole program and must be designed with that in mind. A unit covers one subject, has a fixed number of credit points, usually only spans one semester, may have prerequisite units and is usually at a certain level.

Some cross-faculty collaboration can be seen at the specific unit level. For example, Deakin University found that all four of its faculties needed to participate in the development and teaching of a new unit on environmental sustainability in order to “provide students with the vision, tools and inspiration to meet challenges” (Deakin University, 2012, p. 1). The further challenge noted in the Good Practice Case Study regarding this unit was the need to achieve this in the context of “no prior knowledge of the environment required”. This unit was the first of its kind at Deakin University and development of the curriculum is described as “rather complex and challenging” largely because of different student perspectives and the need to include cultural, political, social, biological and natural aspects. Despite the challenge, the unit was considered a success and the model suitable for replication in another unit on Entrepreneurship and Information. Similarly, Uppsala University in Sweden created a cross-disciplinary in-service course (that is, unit) for university teachers to learn how to integrate

sustainability in their teaching (Rehn, 2010). This course was designed to align with Uppsala University and Swedish government policy on Education for Sustainable Development (ESD).

We want to distinguish the content needed in many IS units from the content delivered via a service course taught by another faculty. These service courses are offered so that the student can gain foundational knowledge or skills from another discipline that will be used in the degree, such as statistics or basic computer skills with spreadsheets or databases. Service courses are currently the most common type of cross-faculty unit. If we look at the policy document “Principles to Govern Cross-Faculty Teaching” (USQ, 2012) in the University of Southern Queensland Policy Library, we note the use of concepts such as “commissioning Faculty” and “providing Faculty”. The policy clearly only envisages the context of service teaching, where one faculty provides a service to another. The policy outlines that the commissioning Faculty has ownership of the unit and is responsible for setting the objectives and broad outline. The providing Faculty provides the details of the course specification. Any changes to the specification need to be negotiated by both parties. Though not designed for that purpose, the policy is useful in drawing attention to matters that need to be discussed for cross-faculty units that are jointly designed and delivered such as who has ownership, who should examine and moderate assessment and create course content.

There are other models of cross-faculty teaching in addition to the service course. As outlined in an evaluation document of cross-faculty studies at Lund University in Sweden there are a number of existing models based on the recognition that “the quality of study-programmes may be enriched and strengthened by including courses from other faculties” (Lund University 2012, p. 2). Some programmes are co-founded “on cooperation between knowledge areas from different faculties” (ibid.) including programmes in International and Business Administration and Economics, Biomedical, Political Science and Economics, Technology Management and Multimedia Engineering and Environmental Engineering. Other Lund University cross-faculty options include students selecting courses from other faculties and taking double or even triple degrees. The evaluation notes that in the Faculty of Social Sciences and School of Economics and Management only 10% represent cross-faculty full-time studies. In the Faculty of Science and Lund Institute of Technology the figure is 5% and even lower in the remaining study programmes in other faculties. Where degrees are designed to include cross-faculty units the percentage is much higher, for example, in Engineering and Law the percentage is 75%. The document notes that students tend to choose units of study that “continue in the same knowledge-area they have already been in touch with” (Lund University 2012, p.3).

As further evidence that cross-faculty teaching currently tends to mean taking a unit in another faculty, on the learning Intranet for Academics at Edith Cowan University (ECU, 2012) concerning cross-school and cross-faculty units it states:

Although units are owned and run by a particular School, in many classes there may be students from different Schools and different Faculties. This is because students may take units in a different School from the one that offers the course [that is, program], as part of a double degree, second major, minor or as an elective.

These students are likely to be unfamiliar with School-specific academic requirements and expectations, including the expected style of thinking and working, standards of student work and assignment requirements. It is important to provide these students with a clear picture of the requirements and expectations that you and your School have of them, in your particular unit. As course structures and course offerings change each year, the easiest way to find which Schools students belong to is to ask the students.

This webpage highlights some of the issues faced with the current approach to cross-faculty education. However, rather than a “you’re not from around here, are you?” type of approach, we seek a cross-faculty alternative experience where students belong to the same program and feel they belong to the unit.

Our goal goes further. We are interested in designing a whole Information Systems program that will be cross-faculty. Our motivation is based on the premise that content, teaching philosophies and methods, viewpoints, activities, assessments, etc., from different disciplines need to be presented in a coherent rather than a confrontational or conflicting manner requiring the student to reconcile the differences they may observe in different units. This lack of coherence and integration results in graduates that may not recognise that they are even learning about two sides of the same coin in two different units. By learning these viewpoints within the same context allows a holistic view to form. Rather than producing graduates with shallow knowledge of many areas, which is a real risk in IS degrees that must cover the diversity and breadth that is IS, graduates can gain in-depth insights into the interplay of technology, business, and management which will be of great value to themselves and their employer (Lee and Han, 2008, Fang, Lee and Koh, 2005). We further argue the need for integrated co-taught units and a program designed specifically for careers that will be cross-disciplinary, rather than a mix and match approach by picking a unit from this faculty and another unit from that faculty, or even an approach where all content is delivered by the one faculty. In industry, the IS graduate will work with people who have been educated by a range of different faculties. A cross-faculty degree or major will provide that exposure and training earlier. A cross-faculty degree also recognises that the IS discipline (Lee, 2001, p. 174)

examines more than just the technological system, or just the social system, or even the two side by side; in addition it investigates the phenomena that emerge when the two interact.

In this paper, we present a framework for developing cross-faculty degrees and majors. The framework is the product of our experience with designing and implementing a new cross-faculty major in Business Information Systems and was further validated in the creation of a Games and Interactive Design major. Our goal was not only to design and implement the BIS major, but also to do so in a way that would be sustainable and include teaching practices and resources that were feasible to maintain and continue to deliver. We do not actually present the content of these majors in this paper (but if interested in this detail, the major and the units within it can be found in the online university handbook and online unit guide repository UNITS (<http://units.mq.edu.au>), respectively), because we do not necessarily claim that the units we have included are particularly original. In fact, in the design of the curriculum we looked at other similar degrees in Australia and internationally, the ACM/AIS Curriculum Guidelines for IS undergraduate degrees (Topi et al. 2010) and Australian Computer Society Core Body of Knowledge (CBOK). However, we do present the process we went through in coming up with the curriculum and its implementation. Our key contribution is a Theory of Change (ToC) Framework for Designing Cross-Faculty Programs. Our framework is based on ToC because a cross-faculty program requires changes to culture and is strongly influenced by political, economic, environmental and even legal/governance factors. Below we present the process we went through in the detailed design and implementation phase, however, the framework starts with drivers for change, recognising that developing the business case and overcoming the political and economic obstacles are perhaps the biggest challenge.

## CONTEXT

The Business Information Systems (BIS) major is a newly created major that was offered for the first time in 2012. The major is a joint initiative between the Faculty of Science and the Faculty of Business and Economics. It is a unique collaboration between these two faculties developed in order to provide students with an opportunity to study a complete Information Systems (IS) curriculum incorporating both technical (delivered by the Department of Computing) and non-technical aspects (delivered by the Department of Accounting and Corporate Governance). The BIS major could be studied as part of a Bachelor of Commerce (BCom), Science (BSc), Arts (BA) or Information Technology (BIT). Depending on the degree the BIS major could be taken alone or along with other majors, such as Software Development in the BIT. Understanding and elaborating the possible alternative programs was essential to ensure the right combination of content for each context. Each degree has a different goal and focus, therefore it is assumed that students' choices are based on their own goals and perception of the goals of the degrees. After numerous years of negotiation between the two faculties involving the development of a business case and design of the major, the BIS major was approved by Academic Senate in 2011. We were tasked with low-level design of the major for delivery in 2012. As will be outlined in the section on process below, we spent a solid 9 months in a range of activities, some of which required funding support. Having in mind the five factors of success for faculty collaboration (clear vision, leadership, institutional commitment, financial resources, incentives and rewards (Bohen & Stiles, 1998)), we gained 13.8 thousand dollars of Learning and Teaching (L&T) funding via a Sustainability in L&T Grant scheme. Thus we were further commissioned to design the program in alignment with the Macquarie University Academic Plan and Macquarie University's Sustainability Strategy. This involved investigation of how to embed social, professional and environmental ethics related to information technology (IT) across the curriculum, the establishment of sustainable L&T practices, how to ensure learning outcomes and graduate capabilities are sustainable and how to maintain the incorporation of cutting edge research into the curriculum while encouraging our students to engage (inter)personally in research in relevant topics of concern to business and society.

In summary, the outcomes of the project were:

1. A report identifying the knowledge and skills required of a graduate who can communicate with business and information technology professionals (focusing on the role of the business analyst) and their associated educational needs at the undergraduate level.
2. A justified and detailed mapping of the knowledge and skills identified in outcome one across the BIS major specifying stable versus volatile content and activities and their allocation to appropriate units with sustainable associated L&T strategies.
3. Development of supporting teaching resources which allow students to gain the knowledge and skills which applies their business and IT knowledge to be used as a model for development of ongoing material and designed to ensure future sustainability.
4. A generalisable model for sustainable development of other [cross-discipline/faculty] majors.

## APPROACH

Outcomes one to three were addressed following the process and using the methods outlined below. To evaluate and monitor the BIS major and achieve outcome 4, we drew upon a participatory and theory-based approach known as ‘theory of change’ (ToC) developed by Aspen Institute. ToC has been used internationally to assist initiatives in community change (Connell and Kubisch 1998) and for evaluation of educational development work (Hart et al. 2009). The ToC “articulates the assumption about the process through which change will occur, and specifies the way in which all of the required early and intermediate outcomes related to achieving the desired long-term change will be brought about and documented as they occur” (Anderson, 2012, p. 1).

To create a sustainable cross-faculty program, we needed to carefully design the individual units, how they will relate to one another and how we can support the business and IT sides of student learning. To ensure a quality process, we needed to identify which units will contain core and stable material and which units will be subject to frequent review and change. We needed to design mechanisms into the monitoring of the program that ensured that changes to course content did not result in loss of coherence or achievement of the major’s L&T goals and outcomes. We needed to identify, and where necessary develop specific L&T resources for each unit and how each unit would be developed and maintained in a sustainable way.

Empowering students with the knowledge, desire and confidence to be drivers of sustainability can not be done in isolation from the rest of the curriculum. To identify clearly what knowledge and skills will allow students to be successful and responsible citizens in their careers we conducted a literature review and survey (see Activity 1). We then needed to design the curriculum (Activity 2) to allow the identified knowledge and skills to be constructed progressively through a process of experience and reflection throughout their studies. Gaining a deep appreciation of sustainability and the role IS graduates can play can not be done using traditional teaching methods only. Thus, as part of Activity 2, we considered alternative teaching strategies and identified in which units and for what material they would be most appropriate. Strategies considered included those suggested by the UNESCO (1998) project on Teaching and Learning for a Sustainable Future: experiential learning, storytelling, values education, inquiry learning, appropriate assessment, future problem solving, learning outside the classroom and community problem solving.

Activity 3 involved the development of supporting teaching resources which would allow implementation of identified appropriate alternative teaching strategies. To develop these resources we used the Design-based research (DBR) methodology (Reeves, Herrington & Oliver, 2005) which involves a flexible, iterative process. Finally, Activity 4 involved the professional development of a 10-minute movie which outlined the units in the major, how they fitted together, the goals of each unit, and introducing the students to the content, teachers, students, faculties and career paths for a BIS graduate.

### Phase 1, Activity 1 (April-July, 2011):

To achieve outcome one, we commenced with a review of the IS literature of the educational needs of BIS graduates. We wanted to run an industry-based survey to identify educational needs of BIS graduates. However, as the IS field is so broad, we thought it useful to focus on the role of the business analyst, one of the common graduate destinations in current demand and undersupply (McCloud, 2005). Building on the literature (e.g. ACS 2011, Doucek and Novotný, 2007, Huang et al., 2009, Kennan et al. 2007, Litecky et al. 2009, Liu et al. 2003, Miertschin et al. 2006 SFIA Foundation, 2011), to determine what is needed in a BIS major we first conducted a pilot study with our MIT students who were working or who have worked in industry in the role of a BA, or similar roles. This allowed us to develop a validated survey instrument to be distributed to Business Analysts in industry. Recruitment was done via the Australian Computer Society (ACS). Questions in the survey included the importance of particular knowledge and skills, the extent to which the respondent possessed that skill, where that skill should be gained (undergraduate study, postgraduate study or on the job training). The results concerning the knowledge and skills needed and the gaps can be found in (Richards, Marrone and Vatanasakdakul, 2011).

### Phase 2, Activity 2 (July-September, 2011):

As sustainability of L&T in the program was of paramount importance we wanted to ensure that capacity was built across the two departments to deliver the content of the units, with some units being co-taught. Sustainability also meant that we must primarily work with existing units that need careful redesign to meet the needs of the existing cohorts of students, students doing other majors who also want a BIS major and those whose main focus is on BIS and becoming a BA. To ensure research-enhanced L&T we considered models such as having a “latest research” topic as a feature of each unit in the program. To encourage our students to engage in research we introduced learning and assessment tasks into tutorials and assignments that require them to investigate a given or chosen topic. Representatives from both departments participated in this review and design process.

### Phase 3, Activity 3 (September-November, 2011):

From the survey we expected to identify some educational needs that would require special L&T resources. For example, BAs must determine what the user requires and often provide a full technical specification to the programmers to implement. Being able to write this specification and to communicate effectively with the programmer will be difficult if the BA has no understanding of what is involved with implementing a software solution. Therefore, we will need to design one or more learning modules that will provide many of the pieces needed to implement an application but which will allow IS students to develop a small-implemented system to get a full understanding of all phases of the software development life cycle. While the design would be the responsibility of the grant team and other academics from both departments, development of the pieces of the application would be done by a programmer supported by grant funding. A more sustainable solution was later found involving the repackaging of a third year student project that included the full system with documentation and test cases. Selecting a capstone project each year for teaching purposes will be continued.

Phase 3, Activity 4 (October-December, 2011):

To assist students to understand the role of each unit, how they are connected, where they are heading and where they have been, we created a 10 minute video featuring each unit in the major which would be shown as part of kicking off a unit at the start of a new semester. We also hope that the video will give students in this major a sense of belonging to the major even though they may not belong to any one faculty. It also provides an opportunity for the lecturer to ask who is in the major and to help them identify one another and develop and maintain networks over the period of their studies in the major. The movie clarified the sustainability thread weaving through and underlying the BIS curriculum to our students that would help them to see the bigger picture and how each unit fits into the puzzle. While coherence and belonging were the key goals, the video was also seen as a potential marketing tool to raise awareness of the existence of the new major. Similarly, Zheng (2011) developed a promotional video to promote the IS discipline to students undertaking related units who may not have known what it is and the opportunities it offers.

## FRAMEWORK

The Aspen Institute Roundtable on Community Change defined the following core elements of a theory of change (Anderson, 2012, p.7):

1. "A pathway of change that illustrates the relationship between a variety of outcomes that are each thought of as preconditions of the long-term goal.
2. Indicators that are defined to be specific enough to measure success.
3. Interventions that are used to bring about each of the preconditions on the pathway, and at each step of the pathway.
4. Assumptions that explain why the whole theory makes sense!"

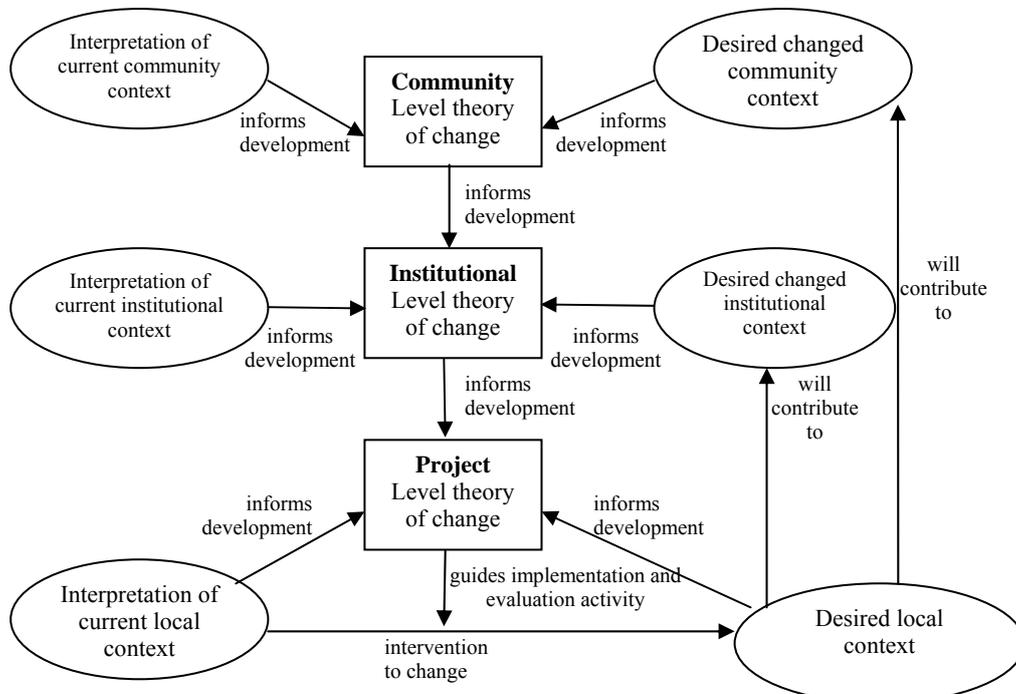


Figure 1: Relationship between Institutional Level, Project Level and Community Level Theories of Change (extended from Hart et al.'s 2009 two-level model)

What is clear from the guide is that the ToC approach is highly collaborative and very outcomes driven. Essentially, we were after a method that would allow us to clearly identify what to measure and how to determine that our goals were achieved. We also see from the core elements above the notions of pathways, preconditions, steps, interventions and indicators. We felt that what we were trying to achieve in the BIS major did represent a true change to the learning community that would be involved.

Hart et al. (2009) used ToC to manage stakeholder engagement in impact evaluation planning also in an educational context. In line with Hart et al.'s (2009) original model, as depicted in Figure 1, we are seeking change at the local context (that is the students, teachers and departments involved in the BIS major) and also at the institutional level (the faculties and the university). However, we have extended Hart's model from two levels to three levels to include the wider community encompassing organisations, industry, other workers, employers and society, in general. We believe graduates who are equipped with multidisciplinary skills and the ability to communicate and grasp a wide range of viewpoints have the potential to impact society more widely particularly because of the pervasiveness of IT and the pivotal and various roles played by IS graduates in finding solutions that address the nexus between technology, business and social concerns.

As a first step in developing a theory of change for cross-faculty program development, we identified potential participants to be involved in the process from the range of BIS major stakeholders. These participants formed a working party that followed the logical model shown in Table 1. We note the use of Enabling, Process and Outcome (EPO) indicators to underpin the model.

Table 1: Logical Model Used to Represent a Theory of Change using EPO Indicators (Hart et al. 2009)

Drivers for Change	Resources/Enabling Factors	Activities	Desirable outcomes	Anticipated Impact
What are the current problems or opportunities for the programme?	What is needed to do the activities leading to the desired outcomes for the programme? (Enabling indicators)	What activities need to be undertaken to achieve the desired outcomes for the programme or project? (Process indicators)	What is desirable and feasible for the program to have achieved? (Outcome indicators)	What will be different for learning and teaching in the future as a result of the programme? (Outcome indicators)

In the following subsections we go through each of the five parts of the logical model to present the final framework in Table 2. They can be seen as stepping-stones in the pathway to achieve the desired outcomes.

### Drivers for change

Identifying the drivers for change involves taking stock of the current situation. As depicted in Figure 1, we needed to interpret the local, university and wider community context. At the local context, we were motivated to create a new major to address lower than target enrolment numbers despite an industry demand for information technology students. We were looking for new opportunities to encourage a new market of students. We were seeing a shift in the interests of students and employers from programming and computer science units to business and management skills (Bullen, Abraham and Galup, 2007, Fang, Lee and Koh, 2005). The university was expecting us to increase enrolments and we faced loss of positions within the department if we were not able to attract more enrolments. In the wider context, we noted job shortages in the ICT industry (McCloud, 2005) and predictions by the ACS of serious future shortfalls. We noted that the context in which our students would graduate is characterised by change and complexity and the need to compete in a globally competitive environment. Finally, expertise did exist within the university, though not in one department or faculty. The summarised drivers for change are listed in column 1 of Table 2.

### Enabling Factors/Resources

When considering resources, it can be useful to think in terms of different types of resources. We considered human, logistical, institutional and external resources. The latter two correspond to resources at levels two and three in Figure 1, however, human and logistical (e.g. time, money and space) resources could cover all three levels. All stakeholders are potential resources and effort should be made to get their involvement. It is not possible, or for logistical reasons even desirable, to have all stakeholders (such as all teachers and students) involved. Therefore, for each type of stakeholder there should a representation that takes into account, for example, a range of levels of teaching experience. Further, amongst the active participants in developing the theory of change, there must be individuals who will be leaders and champions of change.

Other enablers include the institutional support that might be available, such as the L&T grant that funded this project. External resources such as publications and industry reports will also provide essential information that will inform the outcomes and guide the activities identified in the following two steps. Some resources may act more like constraints rather than enablers, for example university guidelines for curriculum development or

professional or academic standards. However, the team should be encouraged to view these as constructive guidance. Where they are truly limiting and seen to be inhibitors, seeking change to the policy, process or standard could be one of the outcomes sought and activities could be designed to achieve that outcome.

Table 2: Framework for Developing a Cross Faculty Major 'Theory of Change' Agenda

<p><b>Drivers for Change</b></p> <p>Societies and organizations face increasingly complex and competitive issues requiring multidisciplinary and cross discipline teams and solutions.</p> <p>Australia as a knowledge economy will need to train graduates for knowledge intensive roles and roles which connect disciplines, for example, the business analyst who acts as the communication channel between technologists and business people to provide technology based solutions to business problems. This is also vital to protect Australia from competitive practices such as offshore outsourcing. Some of these roles will be new requiring new majors.</p> <p>Some of these roles, including the business analyst will play an important role in sustainable use of energy consumed by technology.</p> <p>The university wishes to create programs that attract students and meet industry demand.</p> <p>Employer/student demand and career opportunities mandate multidisciplinary content.</p> <p>Current demand for graduates is unmet.</p> <p>No one faculty/department has all the knowledge and expertise to deliver content required in the major</p> <p>One or more departments/faculties need to increase enrolments.</p> <p>There is currently expertise already accrued in each department.</p>	<p><b>Enabling Factors / Resources</b></p> <p><i>Human Resources</i>                  Leaders and champions in relevant departments/faculties.                  Stakeholders from all involved departments particularly conveners and teachers of the areas potentially involved in the cross-faculty major.                  Stakeholders to include a range of levels of teaching experience and crossing all faculties.                  External evaluator/s and advisors including faculty L&amp;T A/Deans, departmental Directors of Teaching, and representative from faculty quality committees and ASQC.</p> <p><i>Logistical Resources</i>                  Time; Advertising; Funding, Spaces for meetings, Promotional Material, Project Wiki, Website, Regular meetings, Meeting Agendas and Minutes.</p> <p><i>Institutional Resources</i>                  University guidelines for proposal development.                  High level institutional support across faculties.</p> <p><i>External Resources</i>                  International, national, state professional or academic standards and curricula already developed for similar majors.                  Relevant teaching materials and textbooks                  Environmental factors such employee demand and job market analyses.                  Industry Advisory Board                  Publications reporting educational needs and strategies relevant to the major                  Relevant government and industry reports.</p>	<p><i>Participation Activities</i>                  Identify stakeholders, including leaders from all relevant departments.                  Identify group and specific subgroups. All groups should be cross-faculty.                  Regular meeting for the core subgroups to discuss strategic directions and make decisions on the overall program and content on a higher level                  Meetings of subgroups to discuss specific unit content and resources.                  Meetings for subgroups as needed.                  Meeting with external parties such as advisory boards and feedback into internal process.                  Gather and disseminate requirements for content of major via industry surveys, student focus groups, industry advisory board, similar courses at other institutions, stakeholder consultation.                  Identify appropriate conveners and teaching staff with many if not all units co-taught across faculties.                  Identify gaps in teaching staff and material.                  Conduct recruitment where necessary                  Identify appropriate textbooks.                  Develop specific teaching resources</p> <p><i>Research activities</i>                  Review literature                  Create a data collection tool to identify the knowledge and skill needs (Ethics application), analyse data and disseminate results.                  Prepare publication on findings (optional)</p> <p><i>Publicity and Communication Activities</i>                  Disseminate the educational needs for the major via internal and/or external publication</p>	<p>Cross-faculty program /major which includes units co-taught across faculty to ensure sustainable</p> <p>A sustainable program that is shared and driven by committed staff from all involved departments who will continue to evolve the major in line with market needs.</p> <p>Twice a year review process which looks at the changes made and their impact on students/staff.</p> <p>End of semester cross-faculty review/ joint meeting with presentation covering all relevant units that semester to give the bigger picture across the faculty to discuss changes.</p> <p>A report for the A/Dean L&amp;T of involved faculties and their quality committees</p> <p>Yearly review of the program - ideally in Feb prior to commencement of the year to identify any required changes</p> <p>Resources to enable certain skills that require more in depth knowledge than interest permits - identification or development of resources to bridge the gap</p> <p><b>Process / Activities (continued)</b>                  Run information session within each department.                  Prepare marketing material for program                  Prepare an informative video (optional) to build community and awareness for students enrolled in the major</p> <p><b>Long Term Impact</b></p>	<p>Well received program that has a growing enrolment</p> <p>Program that is well respected within the industry</p> <p>Sustainable teaching methods</p> <p>Better collaboration between faculties</p> <p>Potential development of new cross-faculty research areas and higher degree research opportunities.</p> <p>Cross fertilization of ideas, teaching strategies leading to teaching innovations</p> <p>Increased collaborations between faculties in teaching projects.</p> <p>Unexpected outcomes</p> <p><b>Process / Activities (continued)</b>  <i>Evaluation Activities</i>                  'Theory of Change ' agenda                  Comparison with international standard curriculum guidelines                  Comparative evaluation with existing programs in Australia and internationally.                  Alignment with findings from data collection and external bodies.                  Presentation and evaluation by each department and appropriate university quality commit</p>
	<p><b>Process / Activities</b></p>	<p><b>Outcomes</b></p>		

## **Process/Activities**

It is in this middle step that the core work is done on developing the cross-faculty major, so it is not surprising that it contains the longest list of items. The previous section discussed briefly the activities to develop the major that we conducted over 3 phases in 2011. Table 2 summarises the key activities, highlighting the importance of meetings and attendance of appropriate stakeholders at these meetings. Activities around implementation are also included such as identification of suitable textbooks and allocation and/or recruitment of teaching staff.

The activities have been divided into participation, research, publicity and communication, as well as evaluation activities. These activities span all levels, however, most participation activities will involve people from the local level. Essential to the success of the cross-faculty program is the inclusion of stakeholders from all relevant faculties, particularly in the selection of textbooks and weekly topics and joint delivery of those units with cross-disciplinary content. This could involve knowledge specialists in business, computing/technology, finance, management, psychology, sociology or even law. Through the participatory activities in this step (which are ongoing as part of the evaluation step), teaching staff from different faculties will come to appreciate the alternative views and methods which their students will have to deal with. These meetings lead to shared understandings and a curriculum in which the diversity of viewpoints is embedded.

The publicity and communication activities are more targeted to dissemination of the new program to the wider community including prospective students, however, information about the cross-faculty program will need to be disseminated to students, academic and professional staff at the local level to those who were not part of the participation activities. Evaluation activities at the local and institutional level mostly concern embedding the program within current organisation L&T quality control and assurance practices. At the external level, the evaluation activities mostly involve comparison.

Inclusion of research activities is important to ensure that the activities, outcomes and longer-term impact are correctly identified and grounded in the literature and supported through empirical studies. Similarly, evaluation activities are essential. We also note that the outputs to be delivered (such as the results of analysis of the literature review and data gathering, detailed curriculum, publicity material) should be specified in this step. The outputs of the activities should not be confused with the project outcomes, which is the next step.

## **Outcomes**

The four outcomes given earlier in this paper are part of the expected outcomes. Additionally, we have outlined the review and evaluation process for maintaining and monitoring the cross-faculty major. Given the dynamic nature of the ICT field and the knowledge and skills needed by workers in the field, it was essential that mechanisms for ensuring regular review and update as well as measures to ensure sustainability and ongoing support from all faculties involved were outcomes of the project.

## **Long Term Impact**

The long term impact can be thought of as the aspirations we have for the cross-faculty major that we can not expect to see by the end of the project because they require time to emerge, such as “the program is well-respected by graduates and industry”, or the impacts can only be measured or claimed after a suitable length of time has passed, such as sustainable teaching methods.

As the final item in this step we have included “unexpected outcomes”. These are impacts that we had not envisaged. While they were not taken into consideration in the previous steps, they may be desirable outcomes or they may pose obstacles to achieving the long-term changes we had envisaged. Some of the long term impacts may have been explicitly part of our goals and related to the drivers for changes, such as increase in enrolments. Others may be likely spinoff benefits that were not explicit goals, such as increased collaborative activities and innovations between the participating faculties or even collaboration between different faculties.

## **CONCLUSION**

The information systems research community have recognised that IS researchers both need and tend to draw on knowledge from many other disciplines. Through drawing on research from other disciplines we are also increasingly able to impact these disciplines, as evidenced in citations to IS research in non-IS publications (Karuga, Lowry and Richardson, 2007). We propose that information systems students would benefit from being taught by domain experts from multiple disciplines. We do not mean simply that students should take units from other faculties but that via development of a coherent cross-faculty program students will be exposed to multidisciplinary content and perspectives within the same unit. Development of such a program requires careful planning and implementation. We have proposed a theory of change framework for developing cross-faculty programs involving identification of the key drivers, resources and outcomes and joint participation in the activities to design, deliver and evaluate the program. This framework is one of the outcomes of a 2011 project to create a sustainable L&T Business Information System major. We propose that the framework is applicable more generally for other cross-faculty programs. In support of this claim we assessed the applicability

of the framework for our cross-faculty *games and interactive design* major in the BIT. We note that the need for multidisciplinary and diverse content and the need for graduates to become mediators and multi-discipline communicators was not a key driver for the games major. Therefore, the need for change at the local, institution and wider community level was also not as important for the games major and there were fewer units that needed to be co-taught. We thus also conclude that the framework can be useful for examining the need for and value of developing a proposed cross-faculty program; identifying the extent of the change needed; providing guidance with design of appropriate interventions and a pathway to manage the whole process. Further research is recommended to identify how to foster inter-faculty cooperation and deal with operational-level issues.

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