Information Systems and Business Informatics:
An Australian German Comparison

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Abstract

At last year's ACIS conference in Melbourne a panel titled ' IS: A discipline in crisis' discussed issues relating to be in disability of IS in Australia. It is not, however, just the Australian IS discipline that must deal with problems such as the need for better organisational structures and greater visibility in universities. This paper presents a comparison between the German Business Informatics discipline and the Australian Information Systems discipline. The objective is to provide another perspective on the IS discipline to raise new ideas and stimulate discussion with reference to the organisational structure of our discipline in universities.

Keywords

Information Systems , Business Informatics, IS discipline, IS location, IS discipline organisation

INTRODUCTION AND BACKGROUND

A panel '*IS: A discipline in crisis*' presented at the 2002 ACIS conference reported on the outcomes of the AUTC report. The report identified IS as an important part of Business education in Australia, further it was identified as amongst the largest and fastest growing sector within Australian universities during recent years. The AUTC Business education team however highlighted a problem; the IS discipline is often invisible within Australian universities. IS degrees from different faculties often have the same name. This creates difficulty for industry people in identifying IS graduates with business knowledge compared with IS graduates who may not have the same level of business knowledge.

The main contributing factors leading to the view that IS was in crisis were: missing consistent branding, location of IS in universities, no consistent focus in IS degrees, unclear contribution of IS in most statistics, a lack of industry recognition and a lack of industry demand for IS graduates. Furthermore resourcing penalties for IS within Business and Commerce Faculties have often been recognized, because additional government funding goes to faculties with higher costs of presenting ICT courses. Funding is higher for example in computing courses, located in IT, Computer Science or Engineering Faculties. The IS discipline within a Business or Commerce Faculty has to share the funding with the whole faculty for example to support all computer laboratories and so IS suffers (Elliot, Cecez-Kecmanovic et al. 2002).

The Australian higher education system and its historical background can be compared to the German, as both systems are dependent on government funding. It was proposed that Germany could learn from the Australian higher education model at a conference in 1998 on the *reform in higher education in Australia and Germany* at the Australian Centre in Germany (Sitzmann 1998). Recent developments in the German higher education sector indicate more work is needed as the sector moves towards more *internationalisation*, e.g. in the introduction of international study programs like the Bachelor and the Masters.

From an internationalisation perspective the German Business Informatics discipline was compared with the Australian Information Systems discipline at universities. This study involved a comparison of the different organisational structures of the disciplines in both countries, and are presented in this paper.

One challenge identified in Australia is creating a more *visible IS organisational structure in education at universities*. This study examines this issue. Business Informatics in Australia is defined from a German perspective. An overview of the Australian IS discipline is given from the perspective of the researcher during the research period 2002 and early 2003. A comparison of the discipline is made between Australian and German universities in organisational issues. The objective is to identify the organisational location of IS in Australian universities and to give, based on the research outcomes, proposals to Australian IS academics in reference to the organisational structure of Business Informatics in German universities. This overview contributes to a better understanding, and suggests new ideas that may increase the visibility of the Australian IS discipline.

The theme of an IS identity was the focus of a recent paper in MIS Quarterly (Benbasat, Zmud 2003). The authors argue that over the last 30 years little progress has been made on establishing a clear collective identity for the discipline. This paper suggests that an IS identity is a broader problem than just for Australia. It should be noted the issue is examined only from the perspective of education and curriculum in Australian and German universities, the authors acknowledge that research in IS is also important but was outside the research scope.

COMPARING AUSTRALIAN/GERMAN IS/BUSINESS INFORMATICS DISCIPLINE

The following section provides an overview of Australian universities and their Information Systems discipline; and how these relate to the German term Business Informatics. Table 1 summarizes the key points.

	Australia	Germany
Population (2001)	19 million	82.4 million
Student number (2001)	726,418	1,868,666
Students as a % of population (2001)	3.8	2.3
Business Informatics/IS student number(2001)	19,602	22,962
Business Informatics/IS students in % of all students (2001)	2.7	1.2
Number of all public universities (2002/2003)	37	91
Number of public universities that offer IS or Business Informatics in their study programs (2002/2003)	22	67
As a percentage, universities offering IS or equivalent degrees	59	74
Number of universities that offer independent IS degrees (Australia) and Business Informatics degrees(Germany), within faculties in the Business or IT Area (2002/2003)	15 (41%)	25 (27%)

Table 1: Comparison of figures between Australia and Germany

Table 1 indicates that as a percentage of population the number of students enrolled in higher education courses is higher in Australia than in Germany as is the percentage of IS students. Furthermore the percentage of students enrolled in IS or a similar degree is higher in Australia. The number of universities offering an independent IS degree in Australia as a percentage of the total number of universities is also higher.

DEFINING BUSINESS INFORMATICS IN AUSTRALIA – A GERMAN PERSPECTIVE

The term *Business Informatics* is used in Europe for studying an interdisciplinary program that deals with both "business" and "informatics". However, in English speaking countries it is mainly called *Information Systems (IS)* (Kurbel 2003). *Management Information Systems (MIS)* is also an internationally common term for the discipline. The term *Business Informatics* is translated into German as *'Wirtschaftsinformatik'*.

The term *Business Computing*, was formerly used within Australia, but has evolved over the last decade into the term *Management Information Systems* or *Information Systems* during recent years. Tatnall (1993) in writing of the Australian curriculum said "Depending on how you define Business Computing (or Information Systems as it is now often called) …".

The School of IS at Deakin University as one example changed its name and the title of the degree from MIS into IS in 2001, after a major review of IS/IT. In 2002, in Australia, the norm for degrees of this type is *IS* rather than *MIS*, the reasoning being that Australian industry better understands the notion of an IS degree. There have been misunderstandings with the content of a MIS degree and the attributes of MIS graduates. MIS is therefore defined as a part of IS.

Management Information Systems are Information Systems, but only to support the management of an organisation. One definition of IS is as follows:

"Information Systems, which support management with relevant information for decisions, are used to be called 'Management Support Systems'. This relevant information is task-specific content as well as user-friendly and an appropriate presentation of information for the management. The name 'Management Support Systems' is used synonymously with 'Management Information Systems' (MIS)." (Hansen, 1998)

In conclusion, the term IS rather than MIS, has become the preferred term for such a degree, as Management Information Systems courses not only deal with MIS, but also with IS. This change of terminology is quite new in Australia.

To reach a comparable conclusion between Germany and Australia for the purposes here, the definition for Business Informatics in Germany and the definition of Information Systems in Australia are given.

In Germany, Business Informatics deals with information and communication systems, abbreviated to information systems (IS), in industry and government and increasingly it is also found private households. IS are socio-technical systems; meaning tasks are done in cooperation of personal and mechanical task forces. Furthermore, application systems as automatized parts of IS are part of the Business Informatics discipline. Educational task of the Business Informatics discipline is the development and application of theories, concepts, models, methods and case tools to analyse, create and use information systems (GI-Empfehlungen/Wirtschaftsinformatik 2003).

In Australia, the Information Systems discipline is defined by the Australian Standard Classification of Education (ASCED), Field of Education Structure and Definitions, as a subclass of the term Information Technology. "INFORMATION SYSTEMS is the study of the Flow of Information, Capturing Data, and the Design and Specification of Information Systems and User Interfaces. The main purpose of this narrow field of education is to develop an Understanding of the Information Management Needs of users, and the ability to analyse, design and manage Information Systems. Detailed fields of IS are Conceptual Modelling, Database Management, Systems Analysis and Design, Decision Support Systems, Information Systems." (ABS 2001)

These two definitions show strong similarities in their general statements and the key topics they address. Further the educational aims are similar; viewing Information Systems from both sides, from a technical perspective and from a user perspective. Both try to define and teach their subject from multiple views.

RESEARCH

The methodology used for this research was based on structured interviews with open-ended questions, posed to IS academic participants from Australian universities. A copy of the types of questions asked can be found in Appendix A. An interview guideline was prepared. The interview questions focused on: IS educational offerings and organisational structure of IS in Australian universities. The interview questions were guided by the responses of the participants. This allowed some flexibility to change the direction of the interviews as the research progressed. Twelve interviews were conducted. Each interview took approximately 45 minutes and was tape recorded.

To focus the study to a manageable size, for reasons of time, the visited universities were mostly within major cities in Australia and the number of participants was limited to eleven Australian universities.

The guideline for selecting these academics were as follows: the academic must be either in an IS department or in another named department, where it is possible to study a program with IS subjects or at least a combination of IT and business subjects. Preferably, the academic should be in a high academic position as for example the Head of the school/department or a Senior IS academic.

Data from the unpublished Australasian Information Systems survey 2002, which was conducted by Deakin University, School of IS, was used in the research to complete the information about IS at Australian universities.

Information about German universities and their Business Informatics discipline was mainly taken from the 'Studienführer Wirtschaftsinformatik' Mertens et al. (2002), which summarizes Business Informatics study offers of all German universities, furthermore from the Scientific Commission Business Informatics'1 official recommendations for Business Informatics in Germany and from three personal interviews with German Business Informatics professors.

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[1] *‚Wissenschaftliche Kommission Wirtschaftsinformatik'*, See: http://www.v-h-b.de/wi/

COMPARISSON OF TERMINOLOGIES

The AUTC Business Education Study Team conducted research into the state of Business Education in Australia during 2001 and 2002. They identified Information Systems as an essential part of Business education and that the IS discipline is mostly located in Business/Commerce Faculties at Australian universities. The invisibility of the Information Systems discipline was recognised as a critical issue (Elliot, Cecez-Kecmanovic et al. 2002).

From the statistical view provided by the Australian Standard Classification of Education of the Australian Bureau of Statistics, the IS field is defined as a part of Information Technology and is not mentioned in the field of Commerce and Management.

There is therefore a lack of consensus concerning the term Information Systems and where it is placed in the higher education sector in Australia. However, this is similar to the German Business Informatics. German statistics place Business Informatics also within the IT/Computing area, though most German Business Informatics departments are located in Business/Commerce Faculties.

The ISWorld NET2 lists information about IS departments all over the world. In this directory there are also different named IS departments in Australia registered 3. In December 2002, there were 59 departments within 36 Australian universities involved in Information Systems teaching and research. The departments, in which the IS activities were recognised, were: *Computer Science, Business, Commerce, Information Technology, Computing and Information Systems, Environmental and Information Sciences, Information Studies, Computing & Mathematics, Management IS, Computer and Information Science, IS and Management Science, Computing and IT, IT, Computer Science and Computer Engineering, Computer Science and Software Engineering, Management Technology and Environment/Division of IT, Computing, Information Management and Systems, Management, Business Systems, Business Information Technology, Multimedia and Information Technology, Management of IT, Information Engineering, Computer Science and Electrical Engineering, Accounting and Information Systems, Information Management & Marketing, IT and Computer Science, Business and Informatics and Information Systems.*

It is apparent, that there is a high complexity within the structure of the Information Systems discipline in Australian universities.

The research also involved a web survey of IS departments in Australian universities in December 2002. According to the online information provided by the universities, and combined with the Australian Information Systems Survey 2002, twelve universities within Australia in which there are IS schools/departments or an IS unit in Business or Commerce Faculties were identified. Altogether there were twenty schools/departments recognised, which at least contain the term IS in their school/department name or stated IS as a distinct unit within the school/department in the IS Survey 2002. These faculty memberships are shown in Table 2.

Faculty	Number
Business-Commerce	12
IT	3
Science	3
Communication and Informatics	1
Technology and Industrial Education	1

Table 2: Faculties with a named IS discipline within Australian universities, 2002

In Germany, there is more visibility currently for the discipline because there is one term for *Business Informatics*, called *'Wirtschaftsinformatik'*, which is comparable to the former term in Australia, *Business Computing*.

But with the internationalisation of the higher education in Germany in conjunction with the introduction of international degrees like the Bachelor and Masters degree, the terminology is at risk of becoming more invisible, because there already exist different terminologies in the English language at different German universities; for instance the terms *Science in IS* and *Science in Business Informatics* are used (Mertens et al. 2002).

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[2] See http://www.isworld.org/
[3] See http://www.infosys.utas.edu.au/info/isdepts.html

Another example, within the search engines of the German information provider for studying in Australia *Ranke-Heinemann*[4] or the Australian government information for international students *Which course? Which university?*[5], there is nowhere a particular field listed as Business Informatics, which gives detailed information about the possibilities to study, and the discipline Information Systems is only listed under the broad area of Computer Science and not under Business or Commerce.

But there are important differences in the nature of the work. "Information Systems is a discipline which is oriented towards business and commerce; it involves matching information systems requirements to an organisation's objectives. In contrast: Computer Science concentrates on algorithmic processes and system software." (Craig 1996, p.13).

The invisibility problem is also caused by the different locations of the IS discipline. There are several Australian universities which offer IS programs simultaneously in different faculty areas, e.g. in Business as well as in Science or Technology.

One example of this is the School of Information Systems at Deakin University, the degree is offered within that school, the Bachelor of Information Systems. In addition, there is a computing degree with an IS major within the Information Technology School, Faculty of Science and Technology at Deakin University. The offering of IS programs in different faculties in one university, is very common in Australia. Monash University is another example of the invisibility of IS. Though the subjects E-Commerce and IT Commerce are taught out of a Business Faculty, the IS School is located in the IT Faculty. Appendix B summarizes five examples of multiple locations of the IS discipline in Australian universities.

One German university could be considered particularly forward looking as it has established its own Business Informatics Faculty since 2001, called the *Faculty of Business Informatics and Applied Computing*. Before the foundation of this faculty, the Business Informatics discipline was part of the Business Faculty. Though a funding advantage couldn't be identified, the social status of Business Informatics has been fostered. The faculty foundation was justified by the growing numbers of students and staff during recent years as well as the growth of the Business Informatics students numbers in relation to IT student numbers. Also, the interdisciplinary nature of Business Informatics, which comes from the traditional business and computing areas, can be integrated more effectively without Social Sciences, Economy or Law as additional faculty disciplines. However, between German Business Informatics academics this development is discussed critically.

AUSTRALIA/GERMAN COMPARISON OF ORGANISATIONAL STRUCTURE

In Germany as well as in Australia, the Business Informatics/IS discipline is mostly located within Business Faculties. This section presents some *typical features in the organisational structure* of IS Schools/Departments both in Australia and Business Informatics Institutes in Germany and the respective faculties, where they are located. Business Informatics/IS is defined by the Department of Education, Science and Training (DEST) within the IT discipline in Australia it is also included in the IT discipline by the German government. However, in both countries IS is predominantly located in Business/Commerce faculties.

In comparison to Australia, a German Business Informatics Institute refers to an Australian IS School/Department. The position as Head of School/Department in Australia cannot be found in the same way in German Insititutes. German academics do not need to report to his head. Furthermore, in contrast to Australian where deans and heads are permanently involved in managing activities, a German dean acts more as a faculty's representative.

The term *chair* is not so often mentioned as an organisational unit in the Australian IS discipline, in contrast to the German Business Informatics discipline. However, both define chairs (unit chairs) as organisational units under schools/departments/institutes.

In Germany, a chair is defined as an organisational unit within a discipline. Typically, a faculty has several disciplines; and one discipline has several chairs. A chair includes usually one professor as head of the chair and several scientific assistants doing a doctoral or habilitation program. Usually, these assistants have to report to the head of the chair. In Australia, a chair refers to a professor who has reached the top of the discipline. A unit chair has the additional responsibility to coordinate single subjects. There are no additional scientific assistants at a chair.

One concluding difference between the Australian and German organisational structure of the IS/Business Informatics discipline is, that in Germany the position as *Head of Institute* is not equal to the position as *Head of School/Department* in Australia in terms of hierarchical authority. But in both countries the highest academic

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[4] See http://www.ranke-heinemann.de
[5] See http://www.dest.gov.au/tenfields/

degree is not normally as well the *head of a school/department/institute*. This can also be a Senior Lecturer or an Associate Professor. A German chair consists always of a professor as *head of chair* and several academic assistants in lower hierarchical positions.

Another significant difference is in the workload distribution amongst academics. Whereas Australian professors/assistant professors are strongly involved in management and less in teaching, German professors often carry the main workload in teaching activities. In Australia the main teaching load is on lecturers and senior lecturers; German assistants have more time to concentrate on their research projects.

DISCUSSION

Business Informatics in Germany and Information Systems in Australia were compared. The results show *strong similarities in their definitions*. The conclusion that can be drawn is, that you can equate Business Informatics in Germany with Information Systems in Australia compared with Germany, providing the discipline is found within Business or Commerce and IT Faculties.

This study, through a comparison of German and Australian universities has identified a number of differences, some of the differences may account for the lower level of visibility of IS in Australia. In summary the differences and similarities between the two countries in terms of IS that have been identified through this research are:

- Australia is doing very well in terms of the visibility of the discipline amongst university students compared with Germany. There are more students in Australia as a percentage of all students studying an IS degree than in Germany. There are also more degree programs in IS in Australia.

- Whereas in Germany there is one accepted German term for IS there are several in Australia.

- The organisational arrangements for IS schools and departments are similar in both countries. One noticeable difference is the role the head of Department plays and the existence of academic assistants in Germany.

From this the following observations and proposals are made:

- The problem of the invisibility may be exacerbated because the IS discipline is *located in different faculties* and *uses different terminologies*.

- In Australia, 12 of the 19 departments where it is possible to study an independent Information Systems course are located within Business or Commerce Faculties and three independent study courses are taught in IT Faculties. This is almost the same as in Germany. The Department of Communication and Informatics in a Communication and Informatics Faculty was also reviewed. Three other independent degrees are located within an Engineering and IT Faculty or within Arts, Arts and Sciences, Science or Science Technology and Engineering. These faculties are deemed to be outside the scope of this study, because their view of IS is more technical, more creative and scientific or more with engineering focused, rather than business focused as are the majority of cases in Germany.

- The term *IS* could be changed into *Business Information Systems (BIS)*. A term not as confusing as *Management Information Systems (MIS)* for industry people, but signals an IS degree within a Business Faculty where graduates gain additional business skills. This appears to have worked in Germany. There would be fewer problems in differentiating an IS degree from other IS degrees in locations other than Business/Commerce. It also helps increase the visibility of IS graduates' skills for industry employers, who are interested in employing IS graduates with a understanding of business.

- Can the foundation of an Information Systems/Business Informatics Faculty foster the status of the discipline? Could there be any more advantages in such a faculty foundation?

CONCLUSION

This study provides a motivation for encouraging discussion amongst IS academics on their discipline. Given the similarities in IS and Business Informatics between Australia and Germany it would be appropriate to encourage more formal student exchanges. In 2002, there were only four exchange programs between Australian and German universities, offering independent Business Informatics courses (Mertens et al. 2002).

In conclusion, a reference to the MIS Quarterly article "Issues and Opinions - The Identity Crisis Within the IS Discipline" (Benbasat, Zmud 2003) is given. Could such a crisis be overcome by defining and communicating the discipline's core properties as Benbasat and Zmud suggest in their article? And are there any restructuring activities in universities and changes in degree names necessary to cope with that identity crisis?

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APPLENDIX A – EXAMPLES OF QUESTIONS ASKED OF INTERVIEWEES

About IS educational offerings

Does your university offer IS, MIS, BIS or Business Informatics programs?
- ✓ Is it offered as a major or a minor?
- ✓ When was it first introduced at your university?
- ✓ How many students are inscribed at your university?
- ✓ How many students are currently studying such programs at your university?
- ✓ Is/ are the program(s) more orientated towards business or informatics (IT) ?
- ✓ About the organisational structure of IS in the university

In which organisational unit of the university is/are this/these program(s) located?
- ✓ How many people are teaching IS, MIS, BIS or Business Informatics subjects in this school/department?
- ✓ How is this the organisation of this school/department and faculty structured?
- ✓ Are there similar programs at your university located in another faculty?

APPENDIX B

Directory of 5 exemplary Australian universities with more than one IS discipline in one faculty in 2002

Overview of visited universities with more than one faculty including an IS discipline and IS in their programs, but only within *IT, Business, Commerce and Science Faculties*. Other faculties with specialised programs containing any IS subjects are neglected here, e.g. Engineering or Arts Faculties.

University	Faculty	School/Department	Study courses	Program orientation
CQU	Informatics & Communication	Computing and Information Systems	Bachelor of Business(IS), PGradDipIS Management, MIS	Business (Bachelor)
	Business & Law	-	Bachelor of Business(IS)	Business
Canberra	Business, Law and Information Sciences	Information Sciences & Engineering	BIT(Business)	IT
	Business, Law and Information Sciences	Business	B of Business Administration(IT), Bachelor of Business Administration(IS)	Business
Deakin	Business & Law	Information Systems	BIS, Bachelor of Commerce(IS), Bachelor of Commerce(IS) with honours, Masters by Research, PhD	Business
	Science & Technology	IT	Bachelor of Computing (IS stream)	IT & Science
ANU	Economics & Commerce	Business and Information Management	Bachelor of Commerce, Bachelor of eCommerce, Master of Commerce, PhD	Business
	Engineering & IT	Computer Science	BIT(IS)	IT & Science
Unimelb	Science	Information Systems	BIS, PGradDipIS, PGradCertIS, MIS, Masters by Research, PhD	IT, optional Business component
	Economics & Commerce	Accounting and Business Information Systems	Master of Applied Commerce(Business Analyst and Systems) Bachelor of Commerce (Business Systems) Master of Business and Information Technology, Master of eCommerce	Business (Accounting IS)

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