

2001

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## Recommended Citation

Cecez-Kecmanovic, Dubravka and Jerram, Cate, "Understanding Crisis from a Sense-Making Perspective: An IS Operation Change" (2001). *ACIS 2001 Proceedings*. 5.  
<http://aisel.aisnet.org/acis2001/5>

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## **Understanding Crisis from a Sense-Making Perspective: An IS Operation Change**

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### **Abstract**

*In a world highly dependent upon information systems (IS), continuous technological and organisational changes affect, often in hidden ways, organisations' habitual performance, thus increasing the likelihood of crisis and breakdowns. While IS and management literature provide a variety of approaches and methods to deal with these changes, especially IS changeovers and upgrades, we still fail to recognise underlying mechanisms and forces determining their success or failure. Through the examination of a recent crisis in a University, following a changeover in Student IS operations, in this paper we propose a sense-making perspective to explain how and why the crisis occurred. Moreover, we demonstrate how a sense-making view of knowledge management provides a framework for understanding and predicting critical issues in IS changeovers.*

### **Keywords**

Information Systems changeover; Information Systems failure; sense making in organisations; four-level sense making model; sense-making view of knowledge management

### **INTRODUCTION**

The extent to which we have become dependant on the functioning of Information Systems (IS) is vividly apparent when they fail. Those directly affected by the failure become aware of various, often invisible, ties that link IS and their work environment. They experience first hand harmful consequences when these ties break up. Those responsible for the failure, on the other hand, tend to play down its consequences and present the situation either as a partial 'success' or, at worst, as 'having a temporary glitch that needs some fixing'. In IS practice the issues of IS success and failure are fuzzy and controversial, often obfuscated by political game-playing (Mitev, 2000) and social shaping by interested parties (Wilson & Howcroft, 2000). IS failures, however, are of particular interest to researchers "since the controversy surrounding them tends to reveal processes that are more easily hidden in the case of 'successful' projects" (Mitev, 2000). Exploring the underlying issues, ambiguous presentations and controversial consequences of IS failure feature high on the IS research agenda (Myers, 1994; Flowers, 1994; Jones, 1995; Lin & Cornford, 2000; Mitev, 2000; Wilson & Howcroft, 2000).

Approaches in the literature exploring IS failure range from technological and managerial discourses (Flowers, 1994; Jones, 1995; Fortune and Peters, 1995), to socio-technical interactionism (Lin & Cornford, 2000a), to social constructivist understanding of technology and its failure (Scarborough, 1996; Walsham, 1999; Mitev, 2000). The research we present in this paper is broadly within the social constructivist approach. More precisely, by situating the operation and use of IS within the four-level model of sensemaking in organisations (Wiley, 1994; Weick, 1995; Cecez-Kecmanovic, 2000), this research aims to broaden the social constructivist approach. Through an interpretive field study in a University, where a change in operation of an existing Student IS caused a large scale crisis, we aim first, to demonstrate how the sensemaking framework of knowledge management side of the change facilitates understanding of invisible and neglected processes that led to the crisis; second, to explain different interpretations of IS operations change and associated constructions of crisis; and third, to draw lessons about social construction of IS, including conflicting views of their success or failure.

In the course of this paper we detail the methods by which we investigated the IS operation change and ensuing crisis, then narrate the history of the crisis and how it arose. From history we turn to the data and examine the IS at the heart of the problem – before and after, and the transition or changeover of the IS, both planned and actual. Interpreting the empirical evidence from a sensemaking model of knowledge in organisations, we then analyse what went wrong and draw the implications for both IS practice and research.

## CRISIS INVESTIGATED: THE RESEARCH METHOD

This paper focuses on the change in operation of Student Information Systems, as part of a larger, extensive field study on the restructure of the University of Eastern Australia<sup>1</sup> (UEA). This is an interpretivist case study that considers reality as inter-subjectively or socially constructed, thus belonging to the ‘internal realism’ strand of interpretivist research (Archer, 1988; Walsham, 1993, 1995; Nandhakumar and Jones, 1997). As participants in the processes we studied and, more importantly, as actors who experienced first hand the impact of the IS operation change, we developed our own understanding of these processes. While created through personal experience of this change and interaction with other actors, our understanding, we were aware, necessarily involved interpretation. On the other hand, other actors—students, administrators, and teachers—have their own, in principle different, interpretations of the IS change and ensuing crisis. In other words, as interpretivist researchers we have to acknowledge that what we call empirical data are in fact ‘our own constructions of other peoples’ constructions’ (Geertz, 1973).

Given the assumption that actors’ interpretations are shaped by inter-subjectively shared meanings and experiences within particular contexts, our preferred research approach was one of close ‘engagement’ (Nandhakumar and Jones, 1997). As participants (teachers) we lived through the IS operation change together with other actors, our students, student administration officers and other fellow teachers. As true insiders we shared our experiences and feelings with other actors in our work environment. We got involved in face-to-face conversations on a daily basis and discussed issues with them on many occasions. However, we did not have direct interaction with many other, more remote actors and therefore had only limited access to their interpretations. With some of these actors we communicated by e-mail (particularly intensively following the IS operation change) and kept e-mail records and public documents for further analysis. In such a way we gained some clues of their views, approaches and interests regarding the IS operation change but could not share in their personal experiences of the impacts of IS change in their particular contexts. We therefore conducted a series of interviews with key personnel. Twelve in-depth interviews, varying in length from one to three hours, have been conducted (to date) with managers, administrative staff and academics involved in the current restructure. In these interviews, questions regarding the planning and implementation of the IS changeover have provided details of the systems as they were before, the systems as they are to become, and the problems that have occurred in the transition.

As teachers of subjects affected by the IS operation change and subsequent crisis, we had, by the end of the crisis, a considerable collection of participant-observers’ materials in the form of experiences, field notes, personal conversations, emails, phone calls and documentation. The data gathered have been coded and interpreted within a sensemaking framework of knowledge in organisations (Cecez-Kecmanovic, 2000). According to this framework, organisations are understood as continuous interplay between interacting subjects, their intersubjectivity and their collective “we” and generic subjectivity, within the constraints of organisational culture. More precisely, organisations are defined by four levels of sensemaking: 1) the level of an individual who has thoughts, beliefs, feelings, desires, intentions, etc., that is also called an *intra-subjective* level; 2) the level of social interaction at which actors create *inter-subjective* meanings; 3) the level of social structure where social reality is formed, characterized by *generic subjectivity*, and 4) the level of organisation culture or *extra-subjectivity* (Wiley, 1994; Weick, 1995).

In order to interpret the IS operations change and its manifold implications, two levels are of particular importance: the social interaction level and social structure level. By capturing generic meanings, norms and rules of course offerings and student registration, Student IS necessarily belong to the social structure level. On the other hand, student enquiries, registration and enrolment processes involve communication with administrators and teachers, and consequently belong to the social interaction level. The change of IS operation and the crisis in enrolment processes can thus be seen and examined at the social structure and social interaction level simultaneously. By gaining deep understanding of the IS operation change, as perceived at each level, as well as why and how the perceptions at each level differ, our study offered novel interpretations and new insights into the nature of the crisis. These interpretations and insights are in turn tested with participants during interviews and informal conversations.

## CRISIS CREATED

### A History of the Crisis Caused by the Change of Student IS Operation

The purpose of the restructure underway at the UEA is to merge three federated Universities across seven campuses into one University. Each of the three member Universities had separate IS for every function, some

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<sup>1</sup> Not the real name.

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identical, others different. Therefore the restructure entails merges, upgrades and, sometimes, total replacement of many of the IS upon which the University is dependent for functioning of daily and seasonal operations. For the commencement of the first Semester of 2001, several key IS were to be merged, upgraded and replaced simultaneously – many of them the IS upon which the Office of the Academic Registrar (OAR) is totally dependent.

The change of the Student IS took place without much notice to or by academics at the beginning of 2001, but their dramatic impacts were felt immediately. The new functioning of the Student IS enabled student over-enrolments resulting in overcrowded lecture theatres, lack of labs and rooms for tutorials and other resources (lab material, textbooks, other study materials). It also caused the need for additional casual staff. University campuses looked chaotic, students demanded a place in subjects for which they had properly enrolled, academic staff were distressed rushing around to change theatres, to book additional rooms and labs, to find additional casual staff, to order more textbooks, etc. The story leaked to a newspaper, presenting the UEA in a very bad light. It took the UEA approximately three weeks to recover.

### **The crisis: ‘out with the old and in with the new’ – first IS failure**

The three processes that were involved in the crisis were the students' subject enrolments, the tutorial registration and the timetabling and room booking. The subject enrolment process had taken place on *Student Record System (SRS)*, the tutorial registration process was on *TutReg*, and the timetabling system was on *Syllabus Plus*. Typically students would discuss subjects and subject requirements with the Faculty Administrative Officer (FAO) before enrolling (Fig 1a). The FAO would advise a student to consult with a teacher if there were questions the officer could not answer. Teachers often informed the FAO about relevant changes in subject delivery, such as enrolment limits and prerequisites. In the old scenario students could also enrol via the Internet, but the majority preferred to enrol through direct interaction and consultation with the FAO.

After the restructure, a Central Student Service (CSS) was created with distributed officers on each campus. The position of a FAO disappeared. Students were advised to register via the Internet, which the majority chose to do this year. If they had problems or needed help they could go to the CSS (a single place on each campus).

Figures 1a and 1b represent the before and after scenario of the IS operation. The IS – *Student Record System*, *TutReg*, and *Syllabus Plus* – have not changed, apart from some database improvements and upgrades. Student comment regarding the online registration system for Autumn 2001 was that the Web access and ease of use of the online registration had improved from previous semesters. The only visible differences are that the student now goes to the CSS instead of the FAO if they need assistance, and the teacher has essentially lost access to the subject enrolment and tutorial registration systems that they previously had through the FAO.

So what was the crisis? We will take one subject's crisis as an example. The teachers for the subject *Electronic Commerce* turned up to their first lecture, in a lecture theatre that seated 61, expecting the 60 students to which the subject is restricted due to limited lab space with specialised software. Despite the restrictive requirements for the subject (known since it was introduced three years previously), there were 104 students present and enrolled, although many of them had been unable to register in tutorials.

How did it happen? The two databases *SRS* and *TutReg* operate unrelated so that an update of one does not check or automatically update the other. The enrolment therefore required parallel updates of both databases which was done by FAOs. In addition, each system included a different set of rules. In *TutReg* the FAO had entered, at the teachers' standing request, fixed tutorial number limits. The system would automatically refuse further registrations once that number limit was reached. In *SRS*, however, hard quotas were not permitted due to a UEA policy of open access. Officially any student may take any subject they wish, therefore there is no (enabled) capacity in the system to allow enrolments to be automatically shut down once a set number has been reached. Therefore, to prevent over-enrolment, the FAO would monitor the two systems and notify the teacher when fixed limits had been reached, then either shut off subject enrolments manually or negotiate with the teacher to add extra tutorials to accommodate the greater numbers.

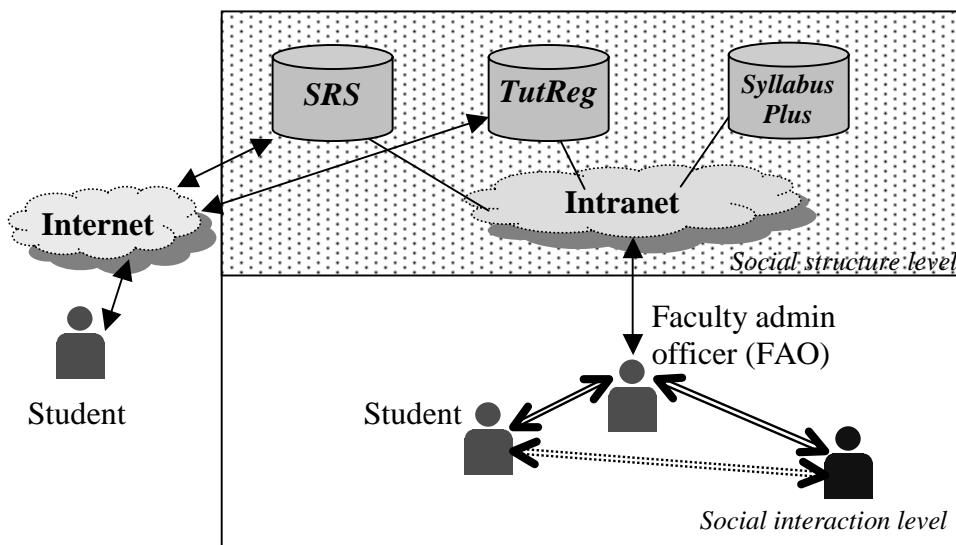


Figure 1a) Old registration and enrolment process

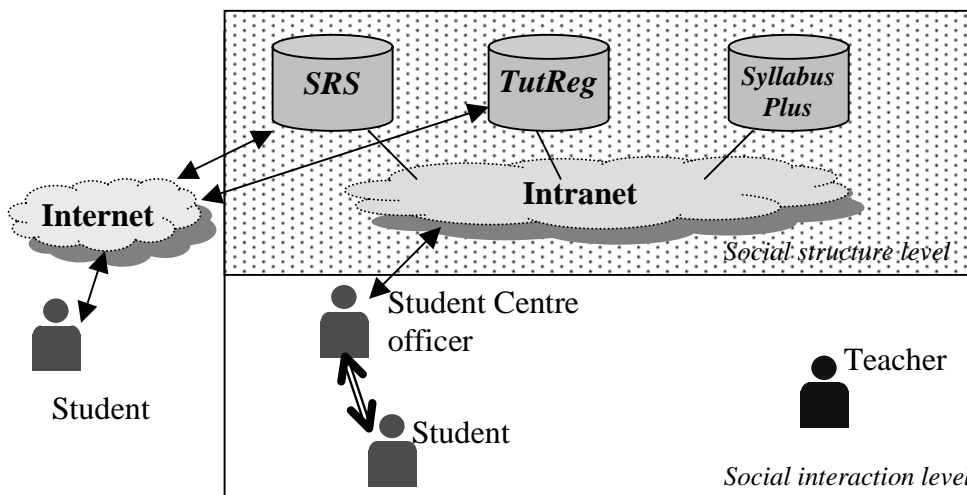


Figure 1b) New registration and enrolment process

Figure 1: 'Out with the old and in with the new'

In the new IS operation, the FAO, who had monitored and communicated issues such as quotas and over-enrolments, had been removed. The student was to enrol then register online and - if encountering difficulties (such as not being able to register in a tutorial for a subject in which they are enrolled) - approach the CSS for assistance. These (new) CSS officers, however, had no knowledge of subjects or teachers. Teachers on the other hand did not even know these officers existed. Therefore when students approached the CSS officers, the personnel there had no answers for the students and sent the students back to the old FAOs who were now placed in different roles in the restructure. The old FAOs had, however, been advised not to talk to the students and not to continue old roles, and sent the students back to the CSS Officers. As one of the ex-FAOs describes it:

They took our jobs, but no one asked us about our jobs - or what they need to do to make it work... They [new CSS officers] can't possibly know all the information for our subjects the way we do, for all the subjects across the entire college! ... The students still come to me. I do as I'm told and send them back to the Student Centre, and they don't know anything and send them straight back to me - but I'm not supposed to tell them anything. I do anyway, but by then it's too late and they've already had this run-around.

Neither the CSS officer nor the students knew to communicate with the relevant teachers directly. So the students were finally left with the understanding that they needed to show up at their first lecture and arrange

tutorials with their teachers. Consequently the two IS continued unmonitored and the crisis grew, unseen and unnoticed.

### **The crisis – first IS failure compounded... with e-mail failure, too**

The first intimation the teachers had of the over-enrolments was at the first lectures when confronted with too many students. In most cases, the students had to leave the first lecture without knowing if they were still able to continue in the subject, or what day or time their tutorial session would be on the following week if they were able to continue the subject. They also did not know where the next week's lecture would be held. They were assured that the teaching staff would notify them by email with the required information as it became available.

The following week continued in crisis mode, as most students did not receive the emails from the teachers. The majority were dependent upon the student email server that was down that week, and emails were not delivered. Students did not know which tutorial had been assigned to them or the location of the new larger lecture theatre.

In one sense the crashing of the student email server is not germane to the IS changeover crisis. In another sense it is pivotal. Primary means of communication for the students with the CSS administration and with their teachers is through email and learning platforms such as WebCT. Therefore with the removal of the one truly knowledgeable person to whom the students could regularly turn for advice and assistance, almost the only means of communication between the students and teachers was through email. The failure of the email compounded the IS operation change crisis to an extraordinary degree.

### **The crisis – second IS failure**

The crisis was extended further by the failure of the new Timetabling IS that was also changed for first semester 2001. Again the change was not in the database but in the personnel. It was an IS changeover that echoed the subject registration changeover. Once more the database remained the same. The teacher still did not have direct access but accessed through an authorised officer. The only difference was that the FAO had been removed and the teacher had to arrange their timetabling with a new College-based Timetabling Officer (TO). This was a new role created for the restructure.

As with the IS changeover for Subject Enrolments and Tutorial Registrations, there was no attempt at transferring knowledge from the FAOs. At no stage in planning or implementation was the FAO approached regarding critical in-house knowledge that allowed smooth functioning of the daily operations of Timetabling. The new TO had no information regarding the facilities to be timetabled. Furthermore, the new TO was not located on the same campus as the subjects to be timetabled. Nor was there anyone appointed on the campus to fill in the knowledge gaps. Consequently the TO would allocate a room with one fixed computer and seating for ten as a venue for a 20 computer tutorial lab, or a room with no functioning data port for a class requiring internet access for the teacher's laptop. It took two weeks to rearrange tutorial times and bookings to allocate computer labs with the appropriate software and equipment. For most of those two weeks, and to enable the process, the teachers were required to double-check the facilities of every room offered to them.

### **Ramifications and Consequences**

The ramifications of this sudden influx by over-enrolment were not as simple as moving students next door into a larger lecture theatre. Not only were larger lecture theatres required, but additional lab-tutorials needed to be booked in already over-booked rooms and computer labs, and additional tutorial staff had to be found and briefed and more text books ordered. Moreover, as this over-enrolment crisis was only discovered at the first tutorial - half way through the first teaching week of the semester - this needed to be done around pre-arranged schedules which included students' heavily booked and carefully worked out schedules as well as the already booked UEA timetabling system.

A teacher of *Electronic Commerce* expressed her frustrations shared by many others:

My classes have been completely disabled. Teaching is weeks behind as a result of this, and I have about 100 frustrated, angry students starting semester well behind the eight-ball.

This is ridiculous! It's three weeks into semester and I'm still spending all day every day running around fixing administrative errors with no time for teaching prep or research.

Most students, on the other hand, whether full-time or part-time, had employment commitments as well as other classes scheduled, therefore the rearrangement of their schedules had serious consequences for many. Despite having to postpone either their graduation or a core subject prerequisite to the next semester's work, many students had to drop the subject as a result. In their e-mails and frequent comments via Electronic forums in

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WebCT, students reported numerous examples of registration process failure, lack of relevant information in the process, uncertainty of enrolment and the implications of changing schedules. Some illustrative examples are:

I was unable to register for e-commerce tutorial as there was nowhere to register. I rang up the uni and kept getting passed on from one person to another, and no one had any useful information...

...people like myself get stuffed around by the system and find themselves in a 20 or so seater class with 40+ students and having to contemplate resigning the subject due to tut selection not going through and subjects being moved...

When registering for tutorials, I have enrolled in a class but when I actually turned up to it, I wasn't on the list.

Registration was a joke. I was unable to get into any tutorial as there were no spaces left in any group. I am doing my final year subjects and I was unable to get any response from the system administrator...

... electronic registration was horrific! You have to sit and wait for pages to load, you hold your breath hoping you can register in the class you choose. Then when it fails, you have to redo it but AGAIN wait for the pages to reload! Then once everything has been registered, you sit and wonder as to whether it worked or not!

...was a complete waste of time. We enrolled on the first day and based our other commitments on the timetable we had registered - then arrived to class unable to sit and not able to stay in class...

The handling of the impact was essentially left to the teachers and the students to work through and eliminate - as best they could - the consequences of the IS failure. The response to the crisis by the various administrators of the new IS was prompt and willing but incapacitated by lack of knowledge. There is even recognition that the crisis will be repeated to some degree in the next semester, as the new IS are still not fully enabled and an awareness of knowledge deficit does not immediately direct the IS operators to an appropriate knowledge source to fill in the gaps.

## **WHAT WENT WRONG – AN INTERPRETATION OF THE EMPIRICAL EVIDENCE FROM A SENSEMAKING PERSPECTIVE**

The University objectives of the student administration restructure were clearly defined: a) to improve services to students, b) to integrate and unify services across campuses, and c) to rationalise staff. To achieve them, a single University CSS was created, with its offices on each campus; a new integrated IS to support distributed operations was planned; old roles such as FAOs and other faculty based student administration positions were abolished and new roles, with new staff, introduced (resulting in net staff savings). The design of the restructured student services took place at the University level and was implemented top-down. The implementation was enforced despite the fact that the new integrated IS—the key enabler of the new structure—was not yet fully operational. The assumption that the old systems with Web-based enrolments and registration (Fig 1) would do the job in the new scenario was never questioned.

However, the first test of the restructured student administration at the beginning of the semester, resulted in the University-wide crisis. CSS officers and major 'designers' of the IS operation change failed to anticipate the implications of the restructure. Moreover, after the first signs of the crisis (in week 1), no action was taken by the responsible officers that would indicate that they understood these implications. Furthermore, as the crisis escalated in the following weeks, all that was done was piecemeal actions - to fix particular subjects, to find additional rooms, to book additional labs, etc. No systemic action by the responsible managers was even attempted to address any of the core issues. We have to note here that the CSS officers we talked to are highly professional and responsible individuals with long experience in student administration. From their perspective they did everything possible to plan the restructure of student administration well in advance, to train their personnel, and to ensure smooth transition (they do not use the word 'crisis') and provide best service in this "difficult period for all".

From the perspective of the FAOs, however, the "consequences were obvious from day one" as soon as they learned about the new structure (in the design of which they were neither involved nor consulted). They, the FAOs, saw themselves as knowledge workers—a key link for knowledge sharing between academics, students, student administration and the IS systems. They knew that such knowledge sharing was part of an habitual performance and that it was essential for subjects planning and student registration processes. When they realised that in the new structure not only was their knowledge lost but that no one would be able to assist in knowledge sharing, they knew the crisis was inevitable. As the crisis unfolded, teachers and students became

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aware of the restructure and the IS operations change. What they could not understand was why the FAOs were excluded from this process and how the designers "from the University level" could have failed to predict such obvious implications.

For us the key question is: How is it that the designers of the restructured student services and CSS officers, on one hand, and FAOs, academics and students, on the other, have such hugely different understanding of the situation, of the IS change and its implications on the delivery planning and student registration processes?

### **Interpretation of the IS operation change at different sensemaking levels**

In an attempt to explore these differences, we shall focus on the nature of the sensemaking levels that are relevant for particular actors. First, we shall consider the social structure level of sense making at which the generic meanings are created and organisational knowledge legitimated. At this level an organisation defines and maintains its identity, creates roles and 'collective agents', establishes values, norms and rules, control systems, patterns of activities or actions, etc. The meanings associated with these elements of the social structure are generic and, in principle, do not depend on an individual interpretation. For a University, policies, norms and rules governing the educational planning and delivery processes are prime constituents of the social structure. By having a responsibility for consistent application of these policies, norms and rules across the University, including putting in place control mechanisms to ensure the compliance in practice, the CSS administration in fact has the role to maintain the social structure<sup>2</sup>. As student Information Systems represent all relevant data, policies and rules related to educational programs, degrees, subjects, etc., as well as the rules regarding registration, enrolment and other processes, these systems, by definition, belong to the social structure, as indicated in Fig 1. Moreover, these IS are the most effective control mechanisms to assure the compliance with norms and rules. Therefore IS have become essential for the maintenance and reproduction of the social structure.

From the CSS designers' and officers' point of view the change in the operation of the Student IS was not a substantive change at all. The policies, norms and rules remained the same and the Information Systems were essentially the same, that is, the social structures pertaining to student enrolments and registration, subject planning etc. were preserved. The only change, as they see it, was in the operational procedures that were to be uniform and rationalised across the restructured University. Their construction of reality reflected their place and role in maintaining the social structure. Their design and implementation of the change of the Student IS operation resulted from their conscious intention to preserve consistency of the social structure (of the restructured UEA) and achieve expected rationalisation of services and personnel savings. From their perspective the use of IS in subject planning and student registration and enrolment processes meant, in essence, data entry. For them, replacing FAOs with campus CSS officers, therefore, meant the change of the data entry point. Everything remained the same, except that the students would have "more options to register via the Web site" or, if they had problems, to contact CSS officers who would do the data entry. Of course they expected some initial problems (the officers needed more training, there were not enough of them, etc.), but "these are all normal problems in a restructure as large as ours". Given the pressures and deadlines they themselves endured in the University restructure process, they felt confident that they did a good job. Even after the crisis was over, they had no understanding whatsoever of the magnitude of disruption created in the enrolments and delivery of subjects nor did they realise the extent and effects of the crisis. Their understanding of the restructure, the Student IS operations change and their implications reflected the construction of reality characteristic of actors maintaining the social structure.

Academics, students and FAOs on the other hand, operate at a level where meanings are intersubjectively created through interaction, conversations, and working together. Their interpretation of the Student IS operations change and subsequent disruption of student enrolment and subject delivery processes reflected their own personal experiences, their contacts with other students and academics, and their intersubjective meaning making. Obviously the more severely affected, the more frustrated and angered they were. As they did not have much communication with the designers or CSS officers, they perceived them as an outside power force that intervened in already well working processes for their own benefit. One must observe that academics, students and FAOs did not have much understanding nor interest in the objectives and intentions of the designers and CSS managers regarding student services restructure. Here again, the interpretations by academics, students and FAOs and their construction of reality reflected their role and place at the social interaction level of sense-making.

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<sup>2</sup> Similar roles are played by Human resources in the domain of employment, remuneration and industrial relations, or by Finance department in relation to financial transactions and management. Apart from these, the social structure also involves generic roles (such as the role of Vice-chancellor), other processes (such as organisational decision-making), or artefacts (such as buildings, logos), that all contribute to organisational identity.

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### **Tensions between the levels**

While social actors create and recreate meanings through social interaction and communication, they also share in the maintenance and reproduction of social structure. They apply policies and undertake actions in compliance with policies, norms and rules. An important characteristic of organisations is the tension between different sense-making levels (Ceccez-Kecmanovic, 2000). For instance, at the social structure level where organisational knowledge is maintained (as part of organisational identity) and where change usually requires a due process, meanings tend to be kept stable. At the social interaction level, on the other hand, it is just the opposite: new meanings are intersubjectively created and recreated as part of everyday activities and processes. This typically causes tensions that are more severe as the discrepancy between the respective meanings gets bigger.

In the case of UEA there is a constant tension between the social interaction level where students' enquiries and registrations occur and the social structure level where norms and rules regarding students' registrations (built into IS) are maintained. Students have specific needs, don't know their options, want something not exactly according to the rules, and have various other special needs (prime examples are part-time students with full-time jobs). The pivotal figure in resolving such tensions before the restructure was the FAO. There is always the need for negotiation or mediation between the rigid social structure level and the social interaction level where things change and happen every day. As the FAOs had a good understanding of the generic knowledge at the social structure level (part of which was captured by the IS) they were able to communicate it to students and teachers and assist shared understanding and collaboration. They provided the bridge between the generic organisational knowledge at the social structure level and inter-subjective meaning-making and inter-relationships at the social interaction level of sense making thus attenuating the tension between these levels.

### **Key roles of FAO**

The sensemaking view of the University (its social structure and social interaction levels in particular), helps us identify the key roles played by the FAOs and the consequences of their abolition. Firstly, the FAO was, in a pragmatic sense, a critical link in interaction between students and teachers in relation to selection and registration for subjects and bookings for timetabling. By interacting with students, the FAO understood their needs, particular circumstances and desires, and assisted them in exploring possible subjects that fit their needs. They also learned about students' experiences from various subjects and difficulties encountered. Moreover, by interacting with the teachers the FAO developed understanding of curricula and individual subjects, their prerequisites, specific requirements of the subject and its delivery, far beyond the short descriptions in the calendar or formal representation in the IS.

Secondly, the FAO assisted both students and teachers to function in compliance with the norms and rules defined at the social structure level. For instance, they assisted students in understanding their status, the requirements to maintain or change it, their rights and obligations in the education process, etc. As for the teachers, the FAO helped them plan the delivery of their subjects, including establishing requirements, conditions of enrolment, student numbers, etc. in accordance to the University norms and rules.

Thirdly, the FAOs mediated the interaction of students and teachers with the Student IS. Given that social structure elements are inscribed in these IS and that the FAOs became the most proficient users of these systems, their mediation compensated for the rigidity of the social structure in respect with particular needs and requirements of students and teachers, specific learning conditions and requirements, etc. Through the regular use of the IS, the FAOs learned to accommodate specific needs within existing normative boundaries and social structures. In that process, the FAOs contributed to increased mutual understanding by all involved (students, teachers and admin) in the total process. This was particularly evident in areas where the IS was insufficient, incorrect or incomplete.

As a final point, the FAOs, having these roles, were uniquely positioned to accumulate and deploy knowledge essential for student registration and enrolments, as well as for subject delivery planning and bookings by teachers. The FAOs were also key to the knowledge sharing among various actors and attenuating tensions between the social structure and social interactions levels. The lack of concern for sensemaking by various actors, and in particular neglecting the essential knowledge acquired by the FAOs by virtue of their role in interconnecting the social structure level and the social interaction level of sensemaking in the University, explains why the designers of the restructure could not anticipate the consequences. This also explains why they did not even consider a knowledge transfer from the FAOs to the new personnel in CSS, or the need to compensate for the key communicative and mediating role played by the FAOs between students, academics, administrative staff and the various IS.

Thus, as the Student IS operation changed and the role of FAOs was abandoned, the tension increased and pulled the actors at the social structure level and those at social interaction level further apart. In the new situation communication between these groups of actors was badly needed but could not happen. Students, teachers and

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Faculty administrative staff, as actors at the social interaction level had no (institutional) channel to communicate with CSS officers. Each of these groups developed their interpretations of the situation, intrinsic to their role in the sensemaking processes in the University. Each of these groups, consequently, socially constructed their own understanding of the IS operation change and the crisis, without any opportunity to mutually challenge each other or learn about each others' views and arguments. Both groups continued their activities in new circumstances, each unchallenged regarding its construction of reality, with tensions still growing.

There is reason to believe that the new IS in UEA will - ultimately - be successful. As these gaps in knowledge are identified and recovered, the new IS developed, and the new occupants of CSS roles rediscover for themselves the information and knowledge so well known to the FAOs, the IS functions will gain their new efficiency levels and recover the old efficiencies as well. But that will take time. The failure is now, in the immediate, and that failure will have long-lasting ramifications which will still be causing distressing problems for UEA long after the IS problems have been fixed and the IS become successful.

## **CONCLUSION – A SENSEMAKING PERSPECTIVE ON INFORMATION SYSTEMS CHANGEOVERS**

Returning to the key objectives of our paper, we can draw some significant conclusions from the interpretive field study of the Student IS operation change that triggered a large scale crisis in the UEA. Firstly, by analysing the empirical data (our personal experiences, field notes, documents, interviews) within the sensemaking framework of knowledge in an organisation we were able to demonstrate how actions by different actors are conditioned by their construction of reality, which in turn is intrinsic to their level of sensemaking. Secondly, by focusing on two levels of sense-making, the social interaction level and the social structure level, we were able to explain different interpretations of IS operations change and associated constructions of the new situation (that some call crisis) by various actors. Such an approach enabled us to reveal some hidden structures and mechanisms that appeared vital to the successful operation of IS before the restructure but were disregarded in this change. Thirdly, through this study we demonstrated the applicability and value of the sensemaking perspective in studying organisations and their IS, and the resulting contribution to the social construction approach to IS and their operations, including conflicting interpretations of their role and impact.

Results from our study, while pertinent for the particular organisation and its IS changeover process, have some broader implications beyond this particular case. Organisational IS, like the Student IS in a University or human resources IS, financial IS or customer IS in an organisation, are necessarily part of the social structure in an organisation. Such IS capture organisational knowledge that is generic in nature and has a tendency to enforce stable meanings. As this level of sense-making necessarily exhibits a degree of stability or rigidity, depending how one looks at it, it resists the re-creation and re-negotiation of meanings characteristic of the social interaction level. The more rigid the organisational IS the more it contributes to the tension between these levels. This is, we maintain, the major reason why organisations find themselves “continuously battling against its constraining information systems as it adapts to an ever-changing environment” (Truex et al., 1999, p. 118).

Consequently, the problems related to an organisational IS implementation and its success or failure, can not be fully understood without understanding its role in the processes of maintaining the social structure level, on one hand, and its use in the activities at the social interaction level of sense-making, on the other. Moreover, actors involved in these activities construct their views of the situation and the IS depending on their location in the sensemaking view of the organisation. This in turn determine their social construction of the IS implementation and the benefits or damages to the organisation. This particular approach to IS conceptualisation within the sensemaking framework of knowledge in organisations, we propose, may contribute to better understanding of IS and their success and failure in organisations.

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