

## EVOLUTION OF THE HUMBLE CASE STUDY

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### ABSTRACT

*This paper addresses the problem of providing learning experiences suitable for developing high-level organisational analysis skills in a climate of increased student numbers. It explores the potential of interactive web-based case studies for creating realistic, personalised experiences that scale for large numbers of students in a Business IT department. A discussion of how such software can support learning is provided and user requirements for the software are summarised. The development of the software is outlined and the implemented software is described. The software evaluation approach is described and the evaluation outcomes are discussed. Key findings include:*

- *enthusiastic use of the tool by both staff and students*
- *learning outcomes comparable with previous years while saving staff time and providing much more convenient access to the required information for students,*
- *evidence that a virtual case provided a richer understanding of an organisation than traditional methods*

*Finally, work to broaden use of the tool across the business discipline, and to develop the architecture so that cases can be shared and re-used across institutions, is described in outline.*

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## INTRODUCTION

The Business School at Manchester Metropolitan University (MMUBS) faces a common challenge in Higher Education – the need to maintain quality while student numbers increase and teaching resources remain constant. The Business IT (BIT) section of this school has an undergraduate intake approaching 300 and because of the dynamic nature of IT education, it faces the added burden of constant and rapid change. Undergraduate business education is also challenged by the lack of context and general knowledge that school leavers bring with them to University. This makes teaching about business processes and their analysis a much greater challenge than it is for more mature students. Systems and Organisational analysis (hereafter referred to as “systems analysis”) has in the past required large amounts of staff time in order to provide realistic experiences to support student learning. The motivation for this research is our desire to reduce the effort required and enhance the range of learning experiences provided.

The paper analyses the use of case studies to address this problem and provides a short discussion of the way in which interactive case studies support learning in the area of systems analysis. We summarise this research with our own understanding of how an interactive case study differs from a paper-based case. The paper then looks at the requirements used to build an interactive, web-based case tool and describes our approach to evaluating the tool. Lastly, we discuss the outcomes of our evaluation and make some observations on the impact and value of the work undertaken so far.

## TEACHING SYSTEMS ANALYSIS WITH CASE STUDIES

In the discipline of Information Science, a large amount of time is spent teaching students skills and techniques that generally fall under the heading of “systems analysis”. These skills range from traditional and widely used techniques such as data flow diagramming and entity relationship modelling through to more open-ended approaches such as Soft Systems Methodology. The common requirement for all of these skills is the need to

## CONTRIBUTION

This paper makes contributions to IS Education both in direct practical terms and methodologically.

Systems Analysis, and more generally, organisational investigations, are a core activity for IS professionals. It can be argued that the quality of education in this area relates directly to the quality of the examples that students are given to work on. This research develops an approach to the presentation and use of case material that makes students’ systems analysis practice more realistic and more convenient. It also identifies the potential for sharing case-based resources.

Use of an early realisation of the software with a large cohort of students allowed us to undertake a lightweight but informative evaluation that has pointed to several important improvements. As such, this paper is a strong advocate of this approach to evaluation.

Most importantly, this work has informed plans for further development of this approach by indicating its potential for students and teaching staff.

be able to understand and apply them. Students usually practice the application of new skills in systems analysis to simple, and largely context free, exercises. Having mastered the mechanics of the techniques, it is important for students to apply the techniques to a more realistic problem that is larger and more complex – often a case study. At this stage, it is also possible to develop skills in searching for information pertinent to the given problem and filtering irrelevant information.

At advanced levels of analysis, students of IS are also expected to reason about the relevance and suitability of a technique and, in some cases, adapt standard techniques to the current context. Sophisticated practitioners will often adapt standard techniques in order to meet more precisely the needs of a particular problem or situation.

Case studies are used to simplify problems so that they are tractable within the

scope of a taught course since real-world situations are often too large, too complex and inaccessible for large cohorts of students. Case studies are used to contextualise a learning experience or to enrich an area of study by making it look “real”. A valuable by-product of using case studies with students who have no commercial experience is that they acquire a bank of commercial examples that extends their general understanding of business models and processes. Case studies are used specifically to support learning in taught units where applied skills need to be developed and refined, and in higher-level units where analytic and reflective thinking needs to be supported by rich, concrete examples.

At MMUBS, case studies are used extensively, but until now, they have always been paper-based or focussed on actual IT applications within the University. Typically, paper-based case studies are used when the teaching unit is concentrating on analytical techniques or simplified organisations. Case Studies that focus upon information gathering and “sense-making” or upon higher level reasoning about analytical techniques tend to be based upon organisational aspects of the University itself. University staff then role-play the clients and are interviewed or answer questionnaires about the area of investigation. Although various tactics such as group work and shared interview sessions help to minimise the contact this requires, it is still extremely disruptive when a large cohort of students are undertaking an investigation. Additionally, the university is not typical of the kind of commercial situation that students will encounter after they graduate and some of the benefit of using a case study is lost.

## **HOW INTERACTIVE CASE MATERIAL SUPPORTS LEARNING**

Case Study-based activities can generate high levels of motivation and involvement in students where they are perceived as relevant and challenging (Keller, 1983, Malone, 1981, Ward, 1998). They sometimes have similarities to games (Saunders, 1995) and they support active and experiential learning (Kolb, 1984). More directly, they build upon modern theories of “remembering” (Riesbeck and Schank, 1989),

which argue that human cognition is organised around a case based memory and that learning can be explained in terms of acquiring new cases and retrieving and modifying relevant, existing cases. Case-based models of memory and cognition are related to situated models of knowledge and learning (Brown et al., 1989). Situated learning states that knowledge does not exist as a discrete abstract entity but exists only in a context. Proponents of situated models argue that because knowledge exists in a contextualised form it is best acquired by first-hand experience. However, this is not always possible or even desirable in an academic environment. Hence, Laurillard (2001) argues that academic learning is different from learning in the real world. She argues that academic knowledge operates at a second-order level, reflecting upon experience. Learning in a classroom often involves learning about descriptions of the real world, where those descriptions are symbolic representations. Laurillard argues that academic learning requires a construct to mediate learning. It is easy to see how a case study fulfils this role.

Case studies work effectively in teaching about Information Systems because they operate as a mediating construct, linking the real-world situation with a description or abstraction of that situation. They support students in the process of identifying pertinent facts in complex and “messy” situations (Checkland and Holwell, 1998) and reasoning about the information they have collected using analytical techniques that have been formally taught. More specifically, in systems analysis tasks, case studies can be used to derive specific abstract descriptions of the case in the form of data flow diagrams, rich pictures etc. Hackney et al. (2003) identify five characteristics necessary for a case to be effective in supporting teaching in IS. These include:

- Allow students to learn by doing
- Bring real world examples into the classroom
- Include realistic content, realistic objectives and knowledge transfer
- Bring organisational impacts, social values and ethical issues to the forefront

- Allow students to develop higher-order reasoning

There are very few reports of interactive systems capable of supporting investigations of organisations. Ward (1998) describes a web-based system called “ServiceWatch”. This system provides a simple virtual organisation that students can investigate, see Figure 1.

Students can examine the organisation chart and access details of staff via either the telephone directory or the office plan. Access to staff consists of a simple list of questions that can be asked. Some staff are helpful and answer a range of questions, others are less helpful, or in some cases not present. The virtual organisation provides high quality repair and maintenance services for domestic and industrial heating systems. The online case

study enables students to investigate how the firm operates, what procedures it uses, how staff interact, etc.

Consideration of ServiceWatch convinced us of the feasibility of using a web-based solution to support student investigations and supported our belief that learning with an interactive case study is qualitatively different to using a paper-based case.

### HOW ARE INTERACTIVE CASE STUDIES QUALITATIVELY DIFFERENT?

We argue that interactive case studies are distinct from paper-based case studies in four important ways:

- They are non-linear and gathering information from them is therefore more



Figure 1. screen shot of the ServiceWatch virtual organisation at Huddersfield University (<http://www.hud.ac.uk/schools/comp+maths/servicewatch/swhome.htm>)

congruent with an organisational investigation than it is for a paper-based case study.

- They are capable of hiding information, making information time dependent or even conditional.
- They are capable of supporting a more detailed and realistic representation of the range of different views, beliefs, arguments and points of conflict that are present in an organisation, and the power and other influences that lead to decisions.
- They support students in a realistic process of abstraction about an organisation. As a consequence of their ability to represent in detail the diversity that is present in an organisation they are capable of supporting a realistic analysis and synthesis of that diversity into a simplified and more abstract model of the important forces present in the organisation.

These distinctive attributes resonate with Senge's (1990) description of the value of computer models for creating "practice fields" for the development of high level systemic enquiry skills. In the action-research tradition of Soft Systems Methodology, we defined the intervention we wished to make for teaching systems development skills:

#### **A system to (do what)**

Provide students with a relevant "practice field" for making enquiries about organisational activity, processes, structures and member perspectives

#### **By means of (how)**

An easy-to-use web-based, interactive case study that

- Allows students to ask questions of staff and customers
- Supports structured, time-based release of electronic documents and answers
- Provides meaningful interaction without making high bandwidth demands

#### **In order to (why)**

Develop students' high level soft systems analysis skills

## **DEVELOPMENT OF SOFTWARE**

MMU worked with a small UK software house (MyKnowledgeMap) jointly developing a set of requirements motivated by the foregoing discussion. It was decided that the target audience would be final year undergraduate students following a unit on Soft Systems Methodology. Targeting a 3<sup>rd</sup> level unit bound commercial and academic interests - both parties were interested in e-learning innovations aimed at higher levels of degree courses where reflection and academic analysis are primary objectives. Despite this focus the requirements of lower level, skills-based units were kept in mind while shaping the final software.

Detailed requirements for this system included:

- Allow students to question staff within the case organisation.
- Provide access to a range of organisational knowledge, particularly through company documents
- Include customer viewpoints.
- Enable students to see the effects of particular events and their consequences as opposed to a static view that is fixed in time.
- Allow the asking of one question to be a pre-requisite for asking subsequent questions.
- Optionally allow tutor-defined limits on the number of questions that a student can ask in a particular time frame.
- Optionally allow tutors to require students to explain why they are asking a particular question.
- Track the questions students ask and their rationales for asking questions.
- Provide students with access to lists of questions they can ask and logs of the answers they have received.
- Maximise the level of fidelity and interactivity without making high bandwidth demands.

In addition, a prime requirement of the software was to make it data driven so that the same engine could manage a range of different case studies. This decoupling was also seen as important because it supported an evolutionary approach to the development of the case study, i.e. as tutors noticed gaps or realised ways in which the case study could be improved they would be able to use a simple form to modify the underlying case data.

The project was prototyped rapidly over the first five months of 2003, going through three distinct versions. The case material was built and tested during the summer of 2003 and a hardened version of the prototype was deployed with an industrial strength database in September 2003.

The chosen case was a membership-based advisory organisation providing information and knowledge-based services to IT Managers (see figure 2 for a screen shot of the final prototype). This organisation provided a representative example of a commercial, service-based organisation and was more relevant to the future experience of MMU students than a case based upon University administration. The software was used with final year BIT students in the Autumn term of 2003 and is being used with

MSc BIT conversion students in early 2004.

## EVALUATION

The purpose of our evaluation was twofold:

- We wished to increase our understanding of how students used the case tool and what processes they went through in learning about the virtual organization.
- We wished to verify that the virtual organisation provided a rich and efficient source of information capable of supporting a soft systems investigation and analysis

Following the evaluation we wished to make a number of practical and expedient decisions concerning future use of the tool: Should we continue using it? Were there ways in which we could improve the tool? Could we influence how students approached their use of the tool?

Following current thinking regarding approaches to the evaluation of learning materials (Oliver, 2000, Williams, 2002) we developed a hybrid approach. We defined our project in terms of three statements, *what* it should provide for students, *how* it should

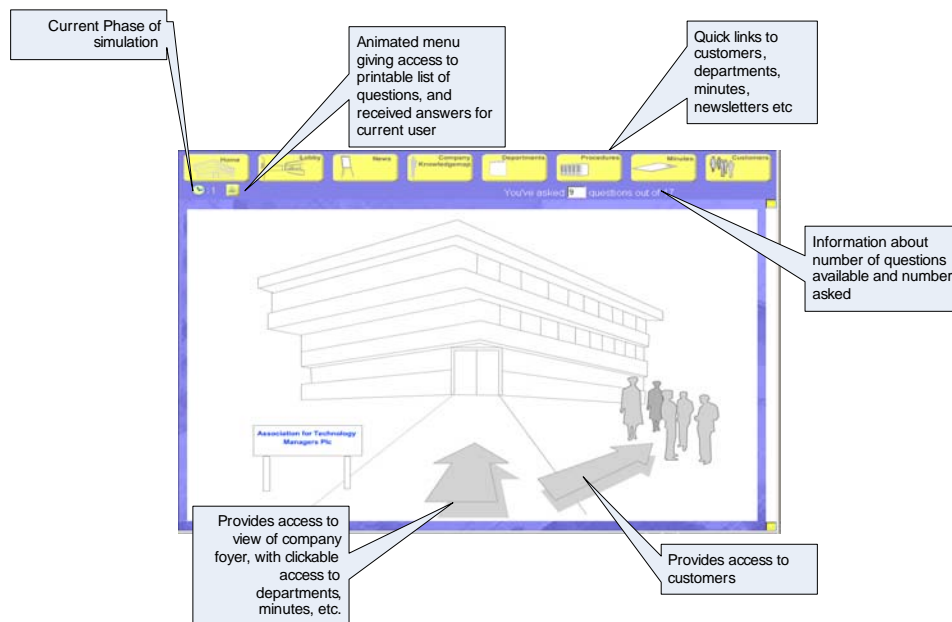


Figure2. Small screenshot of case tool

provide those facilities and *why* it should provide them.

After Checkland and Scholes (1990), we can use our project definition to set specific evaluation tests in terms of efficacy (E1: did the ‘how’ actually happen?); efficiency (E2: did the level of resource consumed by the ‘how’ make it an efficient way to achieve the ‘what’?); and effectiveness (E3: did the ‘what’ achieve the ‘why’?).

Our evaluation of the efficiency and effectiveness of the intervention compared the experimental group with control groups from previous years. Learning outcomes were the same as those from previous years and the same staff were involved in the teaching. However, it was clear that many variables were not controllable. A qualitative assessment of questionnaire responses and student assignments was therefore used to augment the analysis of statistical data. Questionnaire responses (see appendix 1 & 2 for the questionnaires) were used to gather student and staff perspectives on use of the interactive case study and how it could be improved. Our detailed research questions, organised by the 3E model are shown in table 1.

Assessing the effectiveness of the intervention raises a fundamental problem, common in educational research. How can one assess the extent to which the observed learning is a result of the teaching and learning approach used – of which the case tool is only part – and to what extent can the learning outcomes be explained by the aptitudes and working practices of the students involved? We hope that triangulation of statistical performance data with qualitative survey data and analysis of assignment content will help us to understand the extent to which interaction with the tool has penetrated the students’ thinking and demonstrated learning outcomes.

The student questionnaire was delivered via a faculty-wide service used for obtaining general course feedback. The return rate for the questionnaire was 92%. This high return rate was possible because use of the faculty intranet is conditional upon completion of the feedback questionnaires. One side effect of this high return rate was that many students

who were not motivated to complete the feedback were actually forced to respond. Other problems arose from this high return rate, as discussed later.

### **E3: Effectiveness of Case Tool**

Marking, moderation and submission policy was unchanged for the two years of the study. Whilst reference to the case study inevitably varied in the assignment briefs, the section remained consistent that explained how moderated group marks would reward the group's demonstration of intended learning outcomes. It was explained how marks in the same group could vary, based on a combination of: formal peer assessment, tutors' agreed assessment of individual contribution, and understanding demonstrated during the group presentation. The marks and submission rates for this assignment were very similar for the two years examined, see table 2.

The spread of marks was typical of a final year unit. Since both sets of assignments were marked using an identical set of learning outcomes by the same set of staff we believe the spread of marks reflects genuine consistency in student achievement. Interestingly, submission rates went up marginally.

### **E2: Efficiency of Case Tool**

Students were not asked directly about time-saving as they had no basis for a sensible comparison, even though they had undertaken other systems analysis tasks that required them to interview university staff. Responses from questionnaires and student learning diaries (students had to submit a learning diary as part of their assignment) indicated that that the assignment groups usually partitioned their work by allocating an individual group member to collect data from the case tool. The majority of the students that actually used the tool spent between five and ten hours interacting with it, but many students (107 out of 157) claim not to have used the tool. This was unexpected and disappointing, as we had hoped that students would work in groups, interrogating the case and discussing their findings before deciding what to do next. The efficient delegation of this task was pleasing in

**Table 1. Detailed research questions organised by 3E model:**

	Data Source	
	Assignments	Questionnaires/DB
E3 Effectiveness		
Does the case tool support the full range of student achievement across all learning outcomes?	Mark spread & learning outcome coverage	
Does the case tool support student completion rates?	Submission rates & Mark averages	
E2 Efficiency		
Does the case tool save time for staff?		Staff survey
Does the case tool save time for students?		Student survey/ Case tool logs/ Learning diaries
E1 Efficacy		
Was the software easy to use?		Student survey
How easily did students locate the information they were looking for?		Student survey/ Learning diaries
Was sufficient information provided for students to make sense of the organisation?	Assignment content	Student survey/ Learning diaries
What problems did students experience?		Student survey/ Learning diaries
What features did students feel were missing?		Student survey/ Learning diaries

terms of their management of the task but reduced the interactive benefits of a virtual case tool. This is something that needs to be addressed in future use of the tool. Furthermore, the effect of so many students not using the tool calls the validity of the questionnaire into question. We have consequently taken care to avoid relying solely on the quantitative aspects of the questionnaire in our evaluation.

**Table 2. Students marks and submission rates for target assignment completed (i) using interactive case study and (ii) traditional delivery, where staff were interviewed**

	Traditional Delivery	Interactive Case Study
Minimum	34	30
Maximum	71	74
Mean	59	58
SD	6	9
Submission rate	95%	99%

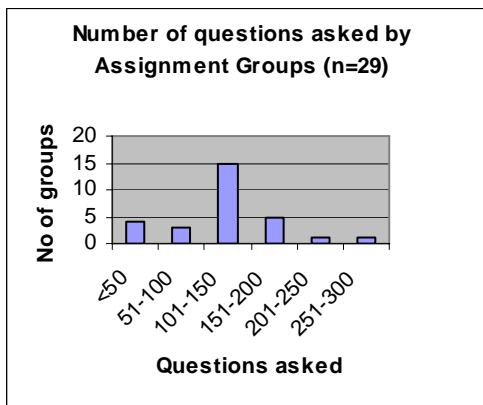
Although it was disappointing that so few students spent time interacting directly with the case tool, this kind of delegation of effort is entirely consistent with our experience of how student groups organise themselves when undertaking face to face interviews for

an analysis task. We were not able to correlate claimed use of the tool with assignment performance as questionnaires were anonymous. Student diaries similarly failed to shed light on the role and importance of group members who had interacted with the virtual case as they reflected upon the analysis methods used, rather than on the process of data collection. We would expect that direct interaction with the case would lead to increased appreciation of the organisation, which would be superior to that gained from simply receiving notes from peers, but it is important to record that these students have developed sophisticated team-working, delegation, task organisation, planning and communication skills through core units in the earlier years of their programme. It is our intention to increase the sophistication of our monitoring and evaluation to gain a better appreciation of team dynamics and the role of the virtual case tool in team learning for future cohorts.

The case tool was designed to record which student groups had asked which questions - we originally thought this would provide a rich and interesting way of analysing tool usage in conjunction with an analysis of student assignments. In reality this proved to be too arduous an analysis to carry out but the



raw statistics that we collected from the case tool were useful. There were 150 questions that could be asked of staff in the case. The histogram in figure 3 shows that several groups asked less than 50 questions while some groups asked more than 150 questions, indicating that they asked some questions several times. This may be explained by the fact that different members of the groups were occasionally working independently. The more interesting aspect of these figures is that many groups felt the need to ask “most” questions. This was confirmed by the questionnaire, where 80% of the groups said they were not selective in the questions they asked. This approach was presumably an attempt to avoid missing crucial data, despite the fact that we designed at least 30% of the questions to be inappropriate for the virtual member of staff being asked and many other questions were duplicated or redundant.



**Figure 3. Histogram showing number of questions asked by assignment groups**

Staff felt that it had saved a significant amount of time compared to the previous year, probably of the order of 30 hours: three staff estimated a saving of up to 10 hours each. However, they also indicated that there was a need to be responsive to students during the assignment by adding in new data/questions. This facility was available but was not used during the trial. Staff time could have been saved further by use of a web site with FAQs to deal with common questions about the nature of the company (not for profit), the status of certain members of staff, e.g. non-executive directors, and the general role and operation of the software.

This version of the tool was designed to limit the number of questions asked by any group of students but there was a problem with the implementation that stopped us from using this feature. The students were aware it was our intention to impose this control. They told us both informally and in the questionnaire that they felt some groups would circumvent such control by swapping answers, e.g.

*“Well, before we knew we had unlimited questions we were a bit freaked out about asking the wrong questions. But to tell the truth I think the different groups would have swapped answers anyway”*

Despite some groups’ intention to circumvent our controls many students felt that a restriction in the number of questions would focus their questioning strategies and simplify the task overall by restricting the amount of data available to them, e.g.

*“Yes, it would mean that our questions would have to be more refined but maybe this would also reduce our time wastage on unimportant questions.”*

Future use of the tool will need to examine critically how we control question asking and how we manage the problem of collusion between assignment groups in swapping answers.

In conclusion the tool seems to have been a net time saver for staff and students. Staff savings will be greater in subsequent years although there is some requirement to modify the case study in minor but significant ways in order to reduce risks of plagiarism. Student savings in time were not hugely significant when compared to the direct interviews used in previous years – although we don’t have any data to make a formal comparison - but the convenience of not having to arrange interviews with real people coupled with the high availability of the tool made a significant improvement for students in terms of being able to manage their time effectively. This was confirmed in both the students’ learning diaries and informal interviews with students.

**E1: Efficacy of Case Tool**

Staff made a few observations regarding the efficacy of the tool. Generally,

they were happy that the tool provided a rich enough source of data about an organisation that was easily accessible and convenient for both staff and students. However, they were not happy that students could print out the full list of questions and answers that they had asked – despite initially requesting this as a facility. Indeed, it was suggested that audio answers from staff would increase fidelity and put more emphasis on students' ability to take notes and report accurately the outcomes of an interview. Staff also noted that although certain aspects of the interview had high fidelity, the detail of the interaction between the virtual staff and students was not taken into account in the answers of the virtual staff and the students were not therefore developing their interviewing skills or other inter-personal skills.

Student feedback about the efficacy of the tool was similarly positive. The case tool was designed to be very simple to use. No user training was given although a demonstration was provided in a lecture. Some students commented on early problems to do with user passwords and the question counter. Both of these issues were resolved within the first week of use. The questionnaire indicated that only 6 out of 157 students did not find the software easy to use, however as we have already stated the validity of this figure is in some question. Staff in tutorials did not report any negative feedback about student use of the case tool and learning diaries frequently contained unprompted but possibly ingratiating positive comments, e.g.

*"I logged into the system today. I'm very impressed."*

*"The system seemed quite straightforward and simple to use, the layout was quite obvious and the HCI of the system seemed quite good"*

Students were asked whether there were questions that they would like to have asked but which weren't available on the list. Again the statistics indicate this was not a significant problem, 12 out of 157 students indicated there were questions they would like to have asked of staff but couldn't. Student learning diaries confirmed that they felt they had obtained sufficient information from the staff in the

case. However, there was also clear evidence that information provided by customers in the case was insufficient and too hard to extract.

During the design of the tool we made a decision to provide a different questioning mechanism for customers and staff. Staff were questioned by pre-defined questions that students selected from a list, while customers could be questioned using a free text question entered by the student. The tool then interpreted the question by matching keywords to a set of pre-defined questions. Students were instructed how this worked but found it hard to identify the right keywords and hence felt they gained insufficient information from the customers. This perception may have been coloured by their expectation of the number of questions they could ask customers - the customers could generally answer fewer questions than the staff. Although this was found to be difficult for students, staff felt that it was useful. A mechanism for informing the students how many questions were available would improve customer questioning and a system of hints, displayed after repeated failures, would further enhance the interaction with customers.

Students were asked if they felt they were finding out about a "real" organisation and although responses were mixed, most indicated that they believed the virtual organisation was similar to a real organisation, e.g.

*"yes, although we thought it was a made up company, it is very similar to a real life business"*

*"In a sense, yes, due to the internal politics played and gaining an insight into peoples thoughts and feelings. It was valuable to gain an insight into each depts working practices"*

Similarly, students' perceptions of the staff in the case were mixed. Some thought they were like "real" people, others didn't. More interestingly, and quite pleasingly, students frequently commented on the unhelpful nature of some staff, reflecting annoyance that the case was presenting them with artificial barriers, e.g.

*“yes, some of them had the same aggressive tone that I have dealt with in real situations”*

*“Yes, often we would get told that they did not know of the answer and the question was misunderstood “*

*“yes,the guy who gave one word answers and claimed he didn’t have time for questions.”*

The only explicit request from students for a change to the software features was for a floor plan, which would indicate the physical proximity of staff and their access to each other. This was an important aspect because of the failure of communication within the case and we will include a floor plan in future.

### **LESSONS LEARNT AND FUTURE WORK**

Triangulating the evidence from the student survey, case tool usage statistics, assignment performance and teaching team comments, we concluded that our intervention of introducing a virtual case tool constituted a positive change to the final year systems analysis unit; and the teaching team agreed that the tool should be refined and used for subsequent years. Their commitment to adapting assessment and support arrangements to ensure that students have a clearer understanding of how and why to use the tool is an important outcome for the project. A summary of the important findings for this research are listed below in Table 3.

With some 300 hours invested in

software development and 40 in developing case questions and materials it was pleasing to see successful outcomes, but we felt that careful targeting of technology features against well-established pedagogical benefits (here of case-based teaching) had reduced uncertainty regarding the likely return on up-front investment. We will be adopting a similar approach to future e-learning interventions and would encourage others to do likewise.

We found the root definition and E3 analysis provided useful structure to our evaluation efforts, and ensured that pedagogical, technical, resource and usability perspectives were all addressed. It is practice that we will be continuing as this action-research project evolves, although we are aware that our research strategy will need to adapt to afford more insight on the way groups engage with the tool, particularly when engagement is driven through a designated user account but learning benefits arise from observation and communication within the group.

From a technical perspective, the database-driven architecture facilitates development of other cases and we are currently developing a second case to support second year students across the business school as they familiarise themselves with the structure, functions and operational complexities of commercial organisations. We are re-implementing the customer questioning facility and working on providing mechanisms for students to find out about informal communication between staff by providing a virtual coffee machine where staff

**Table 3. Summary of findings from this research and our comments on those findings**

Finding	Comment
The case tool supported student learning outcomes equivalent to those from previous years where different approaches were used.	Students were assessed in groups and it is far from clear that all students met all of the learning outcomes. This is more a problem for group assessment than for use of the case tool
Use of the case tool did save significant amounts of staff time	Staff have decided to continue using the case tool.
Use of the case tool was much more convenient for students	Flexible access to an information source seemed to be the key benefit perceived by students.
The tool was easy to use and presented no barriers to students using it	
The questioning method for customers was difficult for students to use.	

conversations can be overheard. A floor plan showing where staff sit and work will be provided in future versions of the tool.

We are also developing a new architecture, using open, XML-based standards, to provide a facility for swapping, sharing and exchanging cases and parts of cases between educational institutions. The use of open standards and the ability to acquire, modify and re-purpose virtual cases would be critical success factors for more widespread adoption, and these will be important considerations for future work. This extension work is being funded by the JISC e-Learning Tools Programme.

## CONCLUSION

The case tool development has been rapid and largely trouble-free. We believe we

have a tool that can provide effective support to a wide range of systems analysis units and other units that can benefit from scenario-based activities. Although the initial effort of creating the first case was significant, it has left us in a strong position to easily extend the cases we can use and develop the software. We believe the tool will provide greater freedom to students undertaking analysis tasks, whatever mode they are studying in, and we know the experience of using the tool is satisfying for students. We are confident that once a range of cases has been developed, this tool will save tutors a significant amount of time. Our main research questions are not fully answered at this point in time but we are confident that we are building a set of data that will illuminate the problem of how interactive case studies support students investigating and analysing complex organisational problems.

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has worked on several European Community projects that focussed on e-Learning and Authoring. He took a break from education for 6 years when he worked as an IT Manager. He has recently returned to education. His interests include Change Management, Agile Methods and e-Learning.



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include Organisational Learning, Change Management, Systems Integration and e-Learning.

## APPENDIX 1 - CASE TOOL EVALUATION

This questionnaire was delivered online via a course evaluation tool provided by the MMU Business School Intranet.

### General Use

1. Did you find the software easy to use?  
(Very Quite OK No Definitely not)
2. Was the software reliable to use?  
(Very Quite OK No Definitely not)
3. Was the graphical interface a bonus or an intrusion?  
(Very Quite OK No Definitely not)
4. Was the experience of using this software satisfying?  
(Very Quite OK No Definitely not)
5. How could the software be improved?  
<free text>
6. How many hours did you spend using the software?  
0 1-4 5-10 10-15 15+
7. Did you use the tool individually or with the group?  
Individually Group

### Asking Questions of staff

8. Were you selective in the questions you asked (or did you ask all questions)?  
Selective not-Selective
9. Did you pre-plan the questions you asked or decide while using the software?  
Planned Some plans Not planned
10. If you pre-planned the questions, did you change your mind as a result of the answers you received?  
Yes No n/a

11. Was the format of pre-worded questions a sensible format?  
Yes No
12. Did you feel that you would have liked to answer questions that were not present in the list?  
If so, how often?  
Always Usually Often Sometimes Never
13. Can you give any examples of questions you would have liked to ask?  
<free text>
14. Were you ever surprised by the answers you received? If so, give examples.  
<free text>

### **Asking Questions of Customers**

15. Did you believe the answers that you got?  
Always Usually Often Sometimes Never
16. Did you ask questions of the customers?  
Yes No
17. Did you find it easy to formulate questions for the customers that they could answer?  
Always Usually Often Sometimes Never
18. If you asked questions of the customers did you find their replies useful?  
Always Usually Often Sometimes Never
19. Would you have liked to answer other questions of the customers? If so, how often?  
Always Usually Often Sometimes Never
20. Can you give any examples of questions you would have liked to ask?  
<free text>

### **Fidelity**

21. Did you feel that you were finding out about a real organisation?  
<free text>
22. Were the staff like real people to interact with?  
<free text>
23. Would a restriction on the number of questions you asked have made it more difficult?  
<free text>
24. The needs of ATM were not supposed to be completely transparent. How would you rate the difficulty of finding out what their needs were.  
Difficult Quite difficult Not difficult Easy Transparent
25. Were the minutes useful?  
Yes Not sure No
26. Were the procedures useful?  
Yes Not sure No

### **APPENDIX 2 – TUTOR QUESTIONNAIRE**

1. Did use of the tool save you any time over the previous year, if so how much do you estimate?
2. Were you required to clarify issues thrown up by the information in the case tool?
3. Did use of the case tool ensure greater consistency in the information the students received?
4. Was the case rich enough to support students in doing a soft analysis?

5. Did the case tool present any specific problems (beyond the early password problem and the inability to limit questions)?
6. What advantages/disadvantages arose from using the case tool?
7. Would you use it again? And if so what changes would you want?

