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1 Introduction

University-level teaching of subjects such as Computer Science or Information Systems is confronted with a variety of challenges today, among them the ever changing content, the changing demands of future employers, or the changing attitude and expectations of young students. Over the years, numerous attempts have been made to meet these challenges, to balance them against academic standards, and to develop a teaching approach that is sustainable in various respects. The present paper reports on one such attempt and is based on our experience of teaching a first-year Information Systems course at the University of Münster in Germany.

Like many courses in Computer Science (CS), introductory Information Systems (IS) courses are faced with specific requirements not present in many other disciplines: First, for many years it was vastly unclear exactly what material to include. Second, many students entering a CS or an IS program are not entirely sure that this will be their "final destination" study-wise. While the first problem has essentially been solved over time, thanks to the availability of comprehensive textbooks such as (Laudon & Laudon, 2014) or (Hasenkamp & Stahlknecht, 2011) with wide acceptance, a solution to the second problem is less obvious. Indeed, in particular in Germany, but most likely in other countries as well, high-school students are hardly advised professionally as to which direction they should follow once they graduate. As a consequence, the decision to enter a particular program is often based on external factors such as career opportunities, finding areas that are considered attractive at the time or for which the student has some form of prior knowledge already. As many statistics show, the result is often frustration already during an early stage of higher education or dropout from a program after a "trial and error" period.

The approach to IS freshmen teaching that we report on in this paper in based on two fundamental design decisions: First, we want to provide our incoming students with a realistic, though admittedly incomplete picture of a typical project someone working professionally in Information Systems may be confronted with. Our intention here is to answer the question about what a graduate of our IS program might actually be doing in his or her future job even before anybody has asked it. Second, we want to enable our students to verify whether they have entered the right program as early as possible, so that not too much time has been lost when someone decides that another subject might be more appropriate for her or him. The solution we propose in this paper to both aspects is to provide case experience from Day One, and to do so by outlining the many facets of information system design and development over the course of an entire semester.

The introductory IS course that we discuss in this paper has been taught for over 20 years in total, and has undergone a considerable development during that period. In a nutshell, it has evolved from lecture-centric teaching that closely follows one of the standard IS textbooks to an experience-oriented approach where the connection to a real-world problem or project is much closer than what any textbook can provide. As is often the case with emerging fields – and IS is no exception – considerable amounts of time are (and need to be) spent on developing terminology and nomenclature; this is then cast into definitions, which students need to comprehend and reproduce. Whether the latter has been accomplished is then tested during one or more exams. The initial version of the course in question here also followed these lines.

Once the ground has been settled, additional goals can be set (and accomplished) in an introductory class, namely to survey a field, in our case to provide an overview of the IS area as far as it is represented by research groups in our department. The result is typically (and in our case certainly was) characterized by some degree of heterogeneity, which most of the time is all but reassuring for the participating students. Yet based on this experience, on discussions with colleagues from around the world as well as on observations on the evolution of the field of IS, we meanwhile feature a different approach where

- We focus on providing each individual student with the ability to reflect his or her choice of studies, determine his or her own interests and planning his or her academic or professional future;
- Students should have the opportunity to experience IS or IS work "in action;"
- Participants should be enabled to decide whether IS is indeed the right choice;
- After having taken the course, they should have an initial idea of what an IS graduate will eventually do in the workplace;
- At the same time, they should be provided with an overview of IS in general and of the remainder of their Bachelor studies in particular.

The remainder of this paper is organized as follows: Section 2 covers background material on IS courses in general and the one at Münster in particular. Section 3 describes the design of our course in detail, while Section 4 provides a discussion of the approach both from a teacher's and from a student's perspective. Finally, Section 5 presents our conclusions as well as a brief outlook.

2 Background

2.1 Skill Acquisition

Information Systems introductory courses are traditionally held as teacher-centered lectures with either individual or group assignments. However, several studies show that lectures which contain, for example, case studies, role-plays, group assignments or other collaborative elements were evaluated better by students than traditional teacher-centered lectures (Al-Shammari, 2005). Furthermore, it helps them to better understand and internalize what they learn in class (Wakefield, Warren, Rankin, Mills, & Gratch, 2012). This adheres to the results from Uno (1999) who classified the methods of learning: Students (and people in general) learn 10% of what they read, 20% of what they hear, 30% of what they see, 50% of what they see and hear, 60% of what they write, 70% of what is discussed, and 80% of what they experience. This classification is in line with Revans' principles of *action learning* (Revans, 1972, 1982). The method of action learning advocates that, within a group, work-based problems are discussed, and through sharing experiences, action is suggested and implemented. In this way, learning from shared experience provides new solutions and helps students to develop their skills.

Already a decade ago, Barr & Tagg (1995) have described a paradigm shift taking place in IS education: from the traditional and still dominant "instruction paradigm", where instructions are provided, to a new "learning paradigm". In line with that, Guskin (1994) pointed out that "the primary learning environment for undergraduate students, the fairly passive lecture-discussion format where faculty talk and most students listen, is contrary to almost every principle of optimal settings for student learning."

According to the Dreyfus model of skill acquisition (Dreyfus & Dreyfus, 1980), students normally pass through five developmental stages: novice, competence, proficiency, expertise and mastery. Dreyfus & Dreyfus argue that as students become more skilled they depend less on abstract fundamentals and more on concrete experience. They further argue that a curriculum like a Bachelor program should address each stage of training in order to achieve optimal learning progress. Applying gained knowledge to practice while being coached by professional tutors is a necessary step to proceed through different learning stages (Schön, 1983).

Besides the challenges of didactics while teaching Information Systems introductory courses, there are also topical challenges. Most undergraduate courses focus on traditional, disciplinary knowledge, although complex transformations and fast technological developments in the management discipline and today's business world require cross-disciplinary skills (Al-Shammari, 2005; Winter, 2002). Educational programs for IS students need to be able to meet these challenges by training and graduating student who are well-equipped with holistic management as well as IT-skills that meet the market needs and the expectations of their employers (Al-Shammari, 2005). In particular, as organization increasingly work process-oriented and BPM tools and methods continue to evolve, the need for BPM expertise is increasing (Bandara et al., 2010).There is a growing number of jobs, like e.g. process analyst, process architect or BPM expert, where specialized BPM skills are required (Lederer Antonucci, 2010; Müller, Schmiedel, Gorbacheva, & vom Brocke, 2014).

2.2 IS Education at the University of Münster

"Management Information Systems" (MIS), or "Information Systems" (IS) in short (also Business Informatics, Wirtschaftsinformatik in German), is the name of an academic discipline positioned at the intersection between various stakeholders (e.g., companies, governments, non-governmental organizations, individuals) having a certain information demand. It studies the potential of current Information Technology (IT) to provide means and solutions for fulfilling these demands (Hasenkamp & Stahlknecht, 2011; Laudon & Laudon, 2014).

Especially in the European regions, Information Systems are understood as socio-technical systems comprised of people, tasks, technologies, and their relationships (cf. Figure 1). People have to fulfill tasks in an efficient way, working to bring a product or service to the market for an adequate revenue. They integrate IT solutions into their day-to-day life for their work and leisure, being – or not being – concerned about privacy or security issues, whether or not to trust the machine or the communication partner. The tasks are being defined, for example, by public or private bodies, by research or the judiciary. IT means can be common gadgets like tablets or mobile phones, but also embedded systems like lane departure warning system in cars. All of these hardware systems require operating systems and run application systems, providing the respective service. Connecting available IT solutions with tasks under consideration of the user spans the field of application for the IS discipline.

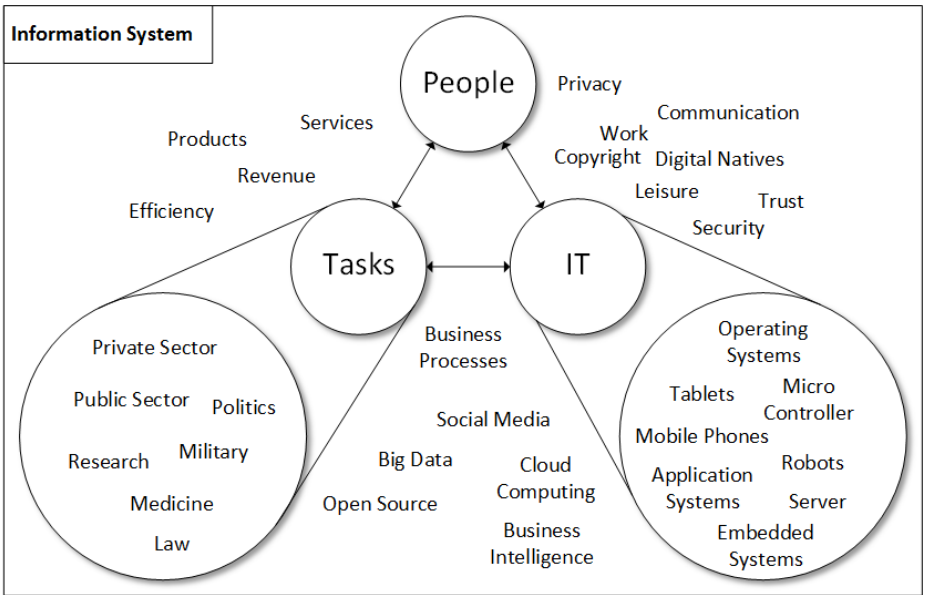

Figure 1: Information System comprised of People, Tasks and IT.

An example where expertise of an IS experts is required is "Big Data". Through the exhaustive usage of IT by people and the vast amount of data being produced each day, "Big Data" has quickly become one of the most relevant topics within the IS discipline. "Big Data is high volume, high velocity, and/or high variety information assets that require new forms of processing to enable enhanced decision making, insight discovery and process optimization". (Laney, 2012) Conventional methods of analyzing data of these characteristics will not work anymore and thus need re-consideration; in particular, the areas of business intelligence (BI) and data warehousing are affected. For this, IS

experts have to have insights into other neighboring disciplines: They have to understand how to work with huge amounts of digital data (Computer Science), which methods to use for analyzing it (Mathematics), under which regulations analysis is permitted (Law), and for which reason to analyze the data (Business Administration).

Evidently, the IS discipline has to be inter-connected with others such as Business Administration, Computer Science, Social Sciences, Humanities, Engineering, or Law. Considering this, IS education faces the challenge to not only provide graduates with an overall understanding of the linked disciplines, but also to integrate these topics to an additional, integrative stream of thought. With this integrated education, IS graduates should be able to understand the needs of the stakeholders and develop new or introduce existing (IT) solutions.

Another example for requirements on the IS expert's expertise is the case of Business Process Management (BPM). Common stakeholders of Information Systems experts are companies using IT to store and analyze data for goal-oriented decision-making, and to identify, support, and improve their Business Processes through BPM. Business Processes are traditionally understood as "[…] a collection of activities that takes one or more kinds of input and creates an output that is of value to the customer" (Hammer & Champy, 2006). BPM in turn "[…] is a comprehensive system for managing and transforming organizational operations, based on what is arguably the first set of new ideas about organizational performance since the Industrial Revolution." (Hammer, 2011). vom Brocke & Rosemann (2014) introduce six fields (called the "six core elements") to describe influences on BPM: Strategic Alignment, Governance, Methods, IT, People, and Culture. In this work, the business processes have to be supported by methods and IT, have to adhere to the corporate governance, have to be aligned to and supported by the corporate strategy, and have to be adjusted to the corporate culture and the people working in the company. To make this happen, the expert has to find a language that is being spoken by all stakeholders: The board, the management, the IT people, and the people working on value-creation. In the IS domain, conceptual models are the means and end for communicating complex issues between different participants (see e.g., Chen, 1976; Wand and Weber, 2002). Therefore, conceptual modeling is in the focus of the IS education at the University of Münster not only during the introductory course, but also throughout the undergraduate studies.

Against this backdrop, we make sure that our graduates are able to communicate with the diverse stakeholders in an IT-related project, structure their thoughts, be able to deepen their knowledge according to the situations they might face, and as a result be able to make sound decisions. During our three-years undergraduate studies (IS Department University of Münster, 2014), we strengthen this by providing basic economical understanding and thinking, basic Computer Science understanding and thinking (including the ability to implement software), basic law understanding and thinking, as well as an integrative understanding and thinking.

Our introductory course intends to provide our students with a first glimpse on this already during their very first term; in addition to this goal of introducing our approach, our intentions include the ones already mentioned in the introduction. To achieve these, we present our course design in the next section.

3 Course Design

The course “Introduction to Information Systems” (taught in German as “Einführung in die Wirtschaftsinformatik”) is part of our undergraduate Bachelor IS program. This six-semester program spans 180 credit points, three of which are earned by successfully passing this course. The lectures are offered by nine different IS professors, addressing various fields touched by the discipline. Four of the professors are core IS researchers, three with close relations to Computer Science, and two with connections to quantitative topics like Statistics and Stochastics.

3.1 Historical Development

From the beginning, the introductory course was offered as a lecturer-centered one, following the classic scheme of four hours lecture and final examination. The design principles of such a lecture are inherent to the course outline set by a single teacher. The lecturer, one of our core IS professors of the Department of Information Systems at the University of Münster, used a self-published textbook, spanning the topics relevant for IS introduction according to the curriculum. As any other course at the University of Münster, the students evaluated this lecture annually, thereby providing the lecturer with praise as well as criticism. Although the lecturer provided a “helicopter view” on the topic, the students learned – efficiency-driven by the exam – several IS concepts by heart, not getting the understanding of the interconnection of the different before-mentioned perspectives on IS. The expected performance of the students was simply reproduction.

To provide a better overview about the variety of IS topics, the scheme was changed from a one-lecturer to a many-lecturer course, including all the senior faculty to present how their respective area (e.g., Computer Science, Logistics, Statistics…) adds to the field of IS. There was no single textbook anymore, but literature offered by each of the participating lecturers. Additionally, an overarching case study connected the different areas, making the students discuss how their learnings from the lecture can be adopted to a (fictional) real-world scenario. Although the overall understanding increased, the students complained about the exam. Without having a textbook, they did not feel like being able to adequately prepare for it. At this point, the lecture was restructured to its current form.

3.2 Current Iteration: Experience-Orientation

We now discuss the most recent version of our introductory IS class in more detail. For this purpose, we will first describe the objectives that were pursued by reorganizing the lecture as well as their underlying rationale and motivation. Afterwards, we will give an in-depth account of how the lecture was structured in order to achieve the defined goals and which tools were used for this purpose. Finally, the results of the students' evaluation will be presented.

3.2.1 Objectives

Experience orientation. One of the primary goals of modifying the lecture was to let students experience the possible future work of an Information Systems graduate as closely to practice as possible. Such an orientation requires, for example, solving tangible,

realistic problems by working with tools and techniques that can also be found in real-world scenarios, and giving students an idea of various job profiles in the IS domain. The primary intention behind this is to allow students to critically reflect on their choice of study program and to decide whether they want to pursue it further. Ultimately, experience orientation in an introductory lecture should allow reducing the number of students who abort their studies in higher semesters.

Raise student satisfaction. At the University of Münster, lectures and lecturers are subject to mandatory evaluation at the end of each semester. This gives students the opportunity to direct criticism as well as praise towards the lecturers. Observations made in this context have hinted at a medium level of satisfaction with the "Introduction to IS" lecture and to significant room for improvements. For instance, a considerable number of students have stated difficulties in learning for the exam or questioned the overall appropriateness of an exam for this lecture. Other comments mentioned issues regarding the organization of the lecture, such as the fact that presentations were often given by research assistants rather than the professors themselves. In the latest iteration of the lecture, attempts were made to address these problems to improve the overall satisfaction of the students. This was hypothesized to be desirable, as a higher satisfaction should lead to an increased interest, engagement, and motivation.

Improve grading. Historically, the *Introduction to IS* lecture employed a final exam which focused on the reproduction of facts and definitions as a means for determining grades. As a consequence of this, students were not engaged over the course of the semester, but instead focused on learning these fragments by heart shortly before the exam. Adding to this, the rate of students who have failed the exam has constantly remained between approximately 10% and 20%. It can be questioned whether such figures are acceptable for a lecture that should provide a motivating and engaging introduction into a whole discipline. As the newly introduced goal of experience-orientation requires constant student participation in all phases of the lecture, relying on an exam was considered not appropriate anymore, thereby a more suitable means of grading had to be found.

3.2.2 Structure

In the winter term 2013/14, the lecture *Introduction to Information Systems* started on October 14th, 2013, ended on February 3rd, 2014, and was attended by 162 students. Its weekly schedule consisted of 14 classroom meetings over the course of the semester with a short break during the winter holidays. Independently of this, the lecture was accompanied by a semester-spanning case study. The overall chronology of the lecture can be seen in Figure 2. From a structural point of view, the lecture was dominated by the aforementioned case study, with all of the 14 dates either providing input for this group-based work or serving as a means for presenting its results. The individual components shown in Figure 2 will be elaborated upon in more detail in the following paragraphs.

Case study. As motivated above, the Information Systems curriculum at the University of Münster puts a strong focus on modeling as one of the central tasks within the domain that graduates will have to perform in their future work life. Therefore, an important part of the revised lecture was a case study centered on the modeling of business processes. At the beginning of the semester, the students were introduced to a fictitious car company

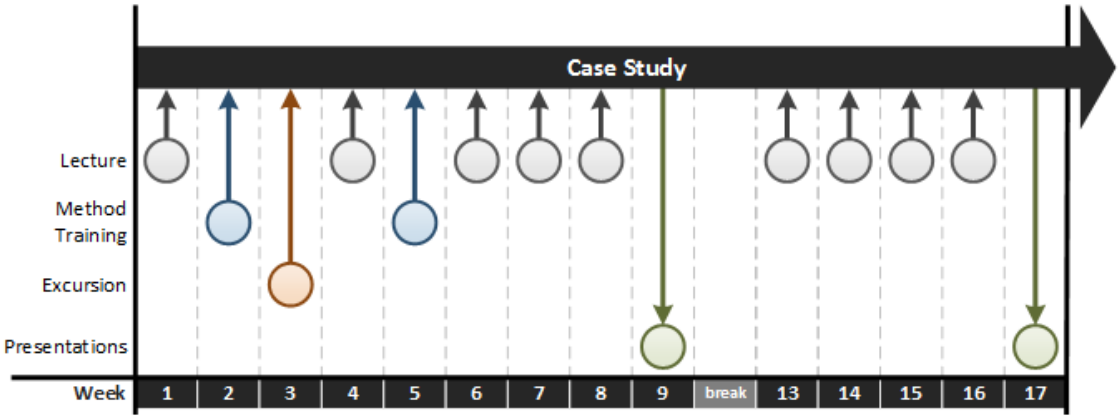

Figure 2: Chronology of the lecture in the winter term 2013/14.

and randomly sorted into different groups, each of which was concerned with one particular department of the firm, such as marketing, production, logistics, or accounting. The first assignment for the students was then to independently research the tasks and responsibilities of "their" department and its interfaces to other parts of the company. Afterwards, the groups had to model the business processes of their divisions over the course of the semester, starting out with rough drafts and revising and detailing them incrementally using the knowledge gained each week through the lectures. To do so, students used the *Horus Business Modeler* which is based on Petri Nets and allows the collaborative, cloud-based development of business process models (Schönthaler, Vossen, Oberweis, & Karle, 2012). It should be noted that students worked on the case study independently and only received occasional technical support. At the end of the semester, each group generated and submitted a report from the work done during the semester containing all created models and detailed textual descriptions.

Lecture. The largest part of the course, namely nine of the meetings, consisted of individual presentations that were given by the professors of the Department of Information Systems. In this context, each lecturer introduced the students to another viewpoint on a specific area of the IS discipline, These viewpoints were Process Management, Supply Chain Management, Interorganizational Systems, Software Engineering, Statistics, Data Management, IT Security, Quantitative Methods for Logistics, and Communication and Collaboration Management. Furthermore, students were given an overview of each area and its most important concepts, and an outlook on future lectures where these topics will be discussed again. Lastly, each of the lecturers provided the students with new input for the case study, as the newly learned ideas and concepts had to be integrated into the business processes of their divisions and the respective models.

Method training. Two lectures differed from the remaining schedule in that they did not focus on a specific area of the IS discipline but rather on enabling students to work with the Horus Method (Schönthaler et al., 2012) and Business Modeler. To that extent, an introduction to the fundamental concepts of business process modeling with Petri Nets was given in a fashion omitting many of the theoretical considerations behind it and instead concentrating on its practical application. Among the topics discussed were the fundamentals of modeling and its significance for IS, basics of business processes how to

manage them, the fundamental syntax of Petri Nets and its execution semantics as well as the basics of control flow and process refinement. This was complemented by a demonstration in which a small-scale case study was used to show the students how to transform textual specifications provided by process stakeholders into process models using all the tools and techniques previously discussed. The result of this demonstration was provided to the students afterwards as a technical reference for their own work on the case study.

Excursion. To initiate the lecture in a motivating and engaging fashion, one of the first meetings was used for a daylong excursion to a factory of a car manufacturer in Cologne. In this context, students learned about their possible day-to-day work as future graduate directly from employees working in related management positions. Additionally, they were given insights into the structure of a large, global organization that helped them to understand the role of their designated division in the case study.

Presentations. After the first half of the semester, all groups were required to prepare a presentation about the initial results of their case study work. For each possible division of the car manufacturer, one group was chosen to present their results based on whether they had performed extremely well so far or made archetypal mistakes from which all students could learn. During these presentations, several professors were present to provide students with valuable feedback and constructive criticism to integrate into their work. This process was repeated at the end of the semester in the concluding meeting of the lecture.

Grading. One of the most significant differences between the lecture as it took place in its most recent iteration and its previous structure was the omission of a final exam. As mentioned earlier, this choice was made to support the focus on experience-orientation rather than the simple reproduction of knowledge. Instead, students had to participate in the excursion and prepare presentations for two meetings during the semester, with the chance (but not guarantee) to present in of these two instances. Furthermore, work on the case study was mandatory, as the final delivery of a report (the so-called process handbook) exported from the Horus Business Modeler was necessary to pass the class. However, these reports were not graded on a traditional scale, but instead on a binary scale consisting of “pass” or “fail” only. The choice to abstain from traditional grades was made due to the case study being based on independent, playful work, experimentation and making mistakes as stepping stones for learning. Consequently, groups were given a passing grade if their reports satisfied a minimal set of formal criteria.

3.2.3 Evaluation

The evaluation of the current realization of the “Introduction to IS” lecture is based on detailed feedback received from 70 students by means of an anonymized online questionnaire.

Overall. The overall grades given to the lecture by students over time is summarized in Table 1. It can be seen that – in contrast to the switch between 2009/10 and 2010/11 – the rating of 2012/13 has been maintained despite a paradigm shift in the design of the lecture. Furthermore, more than 97% of all participants agree that the lecture has provided them with an initial overview of the IS domain. Additionally, 69% of the students indicated that they found the contents of the lecture interesting, 61% found themselves motivated

for the domain and 43% were motivated to engage with the lecture contents proactively.

Table 1: Development of student satisfaction over time.

Term	07/08	08/09	09/10	10/11	11/12	12/13	13/14
Respondents	117	75	95	92	86	68	75
Avg. Lecture Grade (1 best – 5 worst)	1,9	1,9	2,3	2,9	2,6	2,2	2,2

Grading. As mentioned above, students did not receive a grade for the lecture but could only pass or fail based on their attendance on three mandatory dates and the case study report handed in at the end of the semester. As it can be seen in Table 2, this has led to a significant reduction of the rate of students who failed the course from 19% in 2012/13 to 4% in 2013/14. However, due to the paradigm shift in the grading method, these results may not be entirely comparable. In total, 80% of the students positively responded to the omission of an exam, while in turn about 7% would have desired an exam instead of the case study.

Table 2: Development of student grades over time.

Term	**Students**	**Pass**	**Fail**	**Avg. Grade** (1 best – 5 worst)	**Fail %**
WT 05/06	121	94	27	3,36	22,31%
WT 06/07	140	110	30	3,32	21,43%
WT 07/08	141	111	30	3,20	21,28%
WT 08/09	114	94	20	2,85	17,54%
WT 09/10	123	109	14	2,88	11,38%
WT 10/11	139	121	18	3,09	12,95%
WT 11/12	108	97	11	2,83	10,19%
WT 12/13	115	93	22	3,09	19,13%
WT 13/14	154	148	6	N/A	3,90%

Case study. Students generally exhibited a positive attitude towards the case study, with 77% expressing that they favored it over an exam. Almost all of the participants (i.e., 97%) actually participated in case study work, with about half of the groups working individually in separate places and the other half working together in a single location. About 87% of the students indicated that they had gotten a good understanding of the tasks of “their” company division and 76% felt able to create process models, with only 13% having prior process modeling experience. Regarding the choice of software, about 70% of all participants found the Horus Business Modeler to be perfectly suited for the task and the same amount of students would use it again for this lecture. However, about

two thirds would also like to get to know other tools for the same purpose and about one third would have required more preparation regarding Horus. Overall, 63% of the students stated that the case study and the use of Horus have allowed them to learn a valuable skill, 61% felt that it will help them in the rest of their studies and 65% believe that it is relevant for practice.

Excursion. Overall, the excursion was perceived as an interesting and engaging part of the lecture. For instance, one student described it as a "very positive and instructive experience". Managers from different departments of the car manufacturer gave the students detailed insights about the processes run in the company and also about the daily work of employees in the IT department.

4 Discussion

Before starting to redesign the introduction to IS lecture, we encountered several problems with the existing lecture and with the study process of our students in general. First, the lecture was a real “lecture”, meaning that no interactive parts were provided and the students were mere “information consumers”. They learned primarily towards the exam, i.e., the focus was more on learning and reproducing concepts and definitions. Second, the students only got to know a few selected professors from the institute in their first semester. Third, they lacked an overview about what to expect from the rest of their studies and therefore a basis on how to decide whether IS was the right course of studies. In order to improve the quality of the lecture we decided to change several parameters and let the students evaluate the lecture afterwards. Those parameters were:

- Ongoing group work instead of an exam at the end,
- An ongoing case study that runs like a common thread through the whole lecture and an excursion to exemplify the case study and make it more feasible
- The distribution of the lecture slots between all IS professors at the institute in order to get a broad insight into the discipline at a very early stage in the course of studies.

After analyzing the evaluation sheets filled out by the students at the end of the semester, several of our assumptions could be confirmed, while other activities had to be adapted for the next iteration of the lecture. Based on that, a set of “lessons learned” will be presented at the end of this section.

Concerning the overall acceptance of the new structure, the data indicates that student satisfaction is already at an acceptable level and may even reach better levels in succeeding iterations if the criticism provided in the evaluation is addressed. Students were quite content with the new form of grading, i.e., that they did not have to write an exam in the end but were instead graded on the results from their ongoing group work with either “pass” or “fail”. Most students liked the idea of not having to write an exam. This led to a lower number of students failing the course. Thus, two of our objectives, namely “raise student satisfaction” and “improve grading” could be achieved by changing this parameter.

Concerning the case study, the learning result of the lecture is very promising. After looking through all the process model documentations, we got the impression that the student groups really dealt with their topic and their task to continuously model the business processes related to the case study. As most students indicated that they got a good understanding about business process modelling this confirms our assumption that action learning, as reflected upon in Section 2.1 seems to be an appropriate approach for teaching business process modeling. It must be noted that the actual results of the case study were only examined to determine whether individual groups should pass or fail the course, and, thus, no quantitative indicators regarding process model quality can be provided. However, we were able to change the lecture from mere information consumption to "learning by doing" and, thus, achieved our objective "experience-orientation" by introducing the ongoing case study.

Some criticism of the case study remains and should be addressed in future iterations of the lecture. For instance, a large number of students has expressed that they found working independently and without precise instructions directly at the beginning of their

studies very challenging. An equally large number of students has noted that the some lectures did not serve as a good basis for advancing the case study work due to missing connections between the both. Clearly, this is one of the points that should be addressed with a very high priority. Furthermore, some would have liked to receive ongoing feedback during the semester rather than just two particular points in time. Additionally, a few students have noted an imbalance of the difficulty of the case study depending on the division that a group was assigned to. Lastly, some groups also had difficulties with the group work, as there were individuals who participated only very little or not at all. Some of these problems are typical problems occurring in group work (independent work or students not contributing to the group work). Those problems will most probably arise during future iterations as well. However, one problem will be addressed in the next iteration of the lecture: First, the professors have to link their individual lecture to the case study more closely in order to provide the students with information about what to do in their group work. The other problems (missing ongoing feedback and a perceived imbalance of difficulty) will not be addressed for the next iteration but will be kept in mind for the analysis of the next evaluation feedback.

The excursion was generally evaluated as helpful for an in-depth-understanding of the case study. One point of criticism, however, was the insufficient alignment with the case study. For the upcoming iteration we already communicated with the car manufacturer to better prepare their speakers according to the case study and, thus, give the students even more input for their work on the case study. Thus, such an excursion should also be a part of future iterations of the course.

The evaluation of the course has also revealed some additional insights that cannot directly be connected to one of our original parameters. First, the lecture enabled some of the students to reflect their choice of study and come to the conclusion that Information Systems does not suit them. However, as mentioned earlier, this was one of the goals of the redesign, reflected in the objective "experience-orientation". If students at a very early point in their studies realize that it is not what they expected, it is easier to change and start something different. Second, the organization of the lecture created some controversy. On the one hand, many students liked the fact that each lecture was held by a different professor, as this allowed them to get to know all professors at the department at a very early stage. On the other hand, some students noted that this created some confusion as the presentations were of varying quality, focus, and level of detail, some lecturers were not well-informed and, thus, not well prepared for the case study, and a person with an overview of the entire lecture plan was missing. Lastly, after the final presentations at the end of the semester a social gathering was organized. This created opportunities for exchange between students and lecturers and was perceived as very positive and personal.

In summary, the key lessons that we learned from the current iteration of our introductory lecture are as follows: First, a case study can allow students to experience their possible professional futures first-hand and may therefore help them to reflect their choice of studies. Second, letting students work on the case study independently and in groups allows them to train related soft skills but may also pose difficulties for some that can be anticipated. Third, by complementing case study work with traditional lectures, students also gain an overview of the Information Systems discipline and acquire foundational

knowledge. Fourth, a close link between the contents of individual lectures and the case study ensures that students always have the required information to continue their group work. Fifth, a well-aligned excursion can serve as a palpable introduction into the contents of the course and the forthcoming work on the case study. Sixth and last, alternative approaches to grading (e.g., written reports or presentations) may be more appropriate for experience-oriented lectures built around a case study. The building blocks that can be derived from these lessons are summarized in Table 3.

Table 3: Building blocks of the lecture derived from the lessons learned.

#	**Description**	#	**Description**
1	Experience-oriented case study	*4*	Close link between lecture and case study
2	Independent group work	*5*	Well-aligned excursion
3	Complement case study with traditional lectures	*6*	Alternative approaches to grading

5 Conclusion and Outlook

During the last semesters, we gradually changed our IS introductory course from a lecture-centred to an interactive layout. Moving away from textbook-oriented lectures in favour for a case study that is aligned with an exemplifying excursion provides the students with a hands-on experience on what they have to expect from their studies and their job after graduation. Making them think about how to communicate with conceptual models in the various shades of IS provides them already in their first term with a mode of thought we expect them to have. We believe that this setting supports them in deciding early in their studies whether their choice was the right one, and to have a common thread throughout their undergraduate studies.

Besides minor changes, we expect the course layout to be stable during the next terms. Feedback of the students about wrong expectations regarding the excursion and the case study will be addressed by including an additional informal introduction before the start of the lecture. Taking into consideration that lecturers leave the University – and with them a certain topic – and new ones join the department, we will have to include new and exclude or change old topics. We are, however, confident that all of the various facets of IS can be mapped to a case like the one we use.

Regarding the case, we would like to evaluate whether companies from other domains than car manufacturing would also be suitable candidates for the exemplifying excursion and the case study. We are certain that the case study can be transferred to any company that fulfils a certain set of criteria, like its size (medium to large), the coverage of all departments like Human Resources, Finance, Marketing etc., and a strong need for ICT.

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