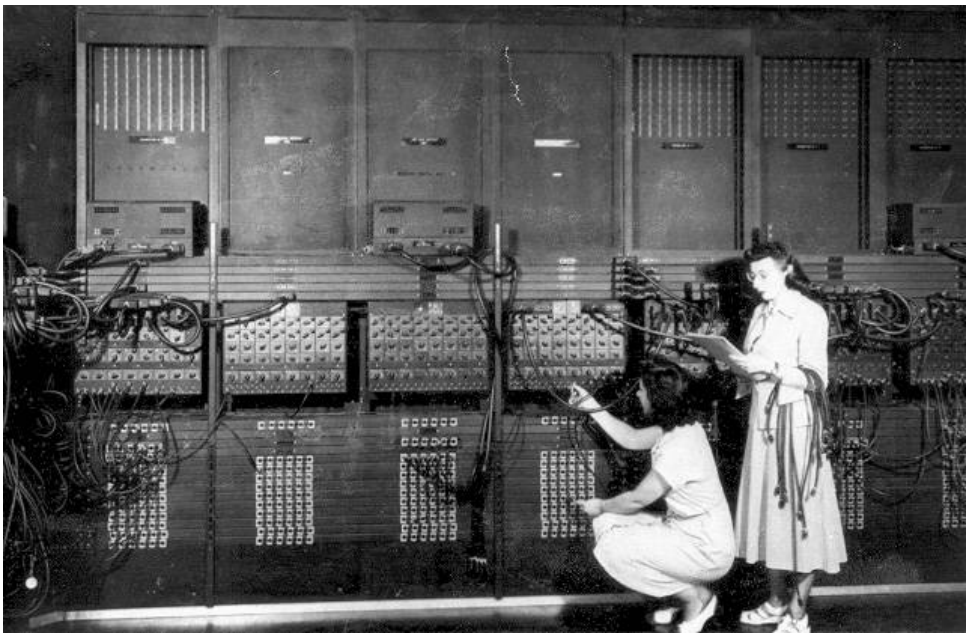
COURSE BOOK

THE DIGITAL ENTERPRISE

SCI1005



1. INTRODUCTION

Too often IT is viewed as the province of technocrats, a domain inhabited by technical experts with little relevance to real-world problems. And yet, the economic importance of information, information systems, and thus information management has been growing constantly over the last decades, thanks to the relentless increase in computer performance.

We are increasingly dependent on information systems and data to make decisions in a wide range of domains. Sensor and network technology helps us to collect and analyze data in real-time, and to speed up decision making in all areas of our society. The possibilities of information and computer science are endless, but they also raise concerns: for instance about privacy, security, and identity, but also about interpretation and perception of data. All these developments have led to the present-day ”digital enterprise”. In digital enterprises, the creation, distribution, use, integration and manipulation of information is a significant economic activity. The digitization of enterprises also has consequences for society. People who have the means to partake in this form of society are sometimes called digital citizens. This is one of many dozen labels that have been identified to suggest that humans are entering a new phase of society. The digital society can be both a threat and an opportunity to enterprises – this is, for instance, clearly visible in sectors such as retail (traditional retailers vs Amazon c.s.), accommodation (traditional hotel vs AirBNB) and transportation (traditional taxis vs Uber).

This course offers an overview of role of digital concepts in enterprises: the digital enterprise. The course provides both a theoretical grounding and a pragmatic approach to applying key concepts. Drawing on ideas, tools, and techniques from such disciplines as economics, sociology, cognitive science, organizational behavior, and computer science, the course shows the digital enterprise from different perspectives: its position in society and the market , but also elements such as governance, information technology, and people. The course serves as an introduction to other Information and Computer Science courses, in which the various topics of the Digital Enterprise will be discussed in more detail.

The learning objectives of this course are:

- To introduce students to the role of data, information and knowledge in enterprises.
- To familiarize students with the background of knowledge management, its models and application.
- To introduce students to the methodologies used in developing information systems (e.g. the systems development lifecycle method versus agile methodologies).
- To introduce students to the organization and governance of data, information and knowledge.
- To introduce students to the managerial challenges associated with the use of information systems in enterprises.

Please note: This course can be used for both the Social Sciences and Sciences concentration. The course is an introductory course to the Information Sciences curriculum, providing an overview of topics

related to the use, embedding and management of information and information technology. The emphasis will be on the organizational (enterprise) context, but we will also touch upon the broader societal impact of information technologies.

2. LITERATURE

In this course, we will be using a set of readings from popular business press journals and academic journals. These articles are available in the EBSCO database. Persistent links to the articles are available under course material on the course page. Your tutor will demonstrate the use of EBSCO during the first group meeting. Appendix A provides guidelines for the discussion of (empirical) research papers.

In addition to the research articles, this course also employs a small set of cases. Students can buy these cases at a special student rate via the website of The Case Centre or the Harvard Business School. A link to the 'case coursepack' will be sent to all course participants at the start of the course.

3. COURSE ORGANIZATION

3.1 LECTURES

During this course, five lectures will be held. Next to the opening lecture (week 1) these include a lecture about knowledge management (week 3), systems development & outsourcing (week 4), digital transformation management (week 5) and a conclusion lecture (week 6). The lectures in week 3 and 4 and 5 are interactive and consist of three parts: an introduction to the theory of the topic concerned, a part on how this theory is applied in practice, and a reflection part, in which we confront theory and practice. These lectures are moderated by Prof. Dr. Frank Harmsen. Guest speakers from industry are involved.

3.2 GROUP MEETINGS

During this course, ten tutorial group meetings will be held. In the tutorial groups, the students will discuss cases, discuss specific topics and work on a group assignment resulting in a paper and presentation about a contemporary information systems topic.

3.3 CASES

During this course we will discuss several cases. During the tutorials, you will be asked to answer specific questions regarding these cases. Similar to PBL, the case based teaching method is student driven, i.e. the tutor mainly has a steering role to fulfil. Most cases are either diagnostic or decision cases (or combinations of the two forms). Diagnostic cases provide descriptions of successes or failures managers have had, so that students can develop their skills of identifying causal links between system features and outcomes. Decision cases pose the basic question: What should be done? Like in the real world,

however, the decision-relevant information provided in these cases is incomplete and partially unreliable.

The use of the case teaching method is a critical design feature of this course. Cases are a very powerful tool in education, because they stimulate learning through the analysis of actual events. They challenge students by bringing them as close as possible to real-life business situations and putting them in the shoes of organizational decision-makers. They spark lively discussion in class.

Cases and case discussions serve three distinct roles. First, they help students develop diagnostic skills in a world where markets and technologies are constantly changing. 'The purpose of business education', a business-school professor noted more than seventy years ago, 'is not to teach truths... but to teach men and women to think in the presence of new situations.'
Second, case discussions help students develop persuasive skills. The ability to tell a compelling story, to marshal evidence, and to craft persuasive arguments is essential to success. It is for this reason that many schools put such a heavy premium on class participation.
Third, and perhaps most important, a steady diet of cases leads to distinctive ways of thinking—and acting. The case system puts the student in the habit of making decisions. Classes revolve around protagonists who face critical choices.

An important prerequisite for the success of cases is preparation. Students are expected to do proper preparation before they participate in the tutorial group.

3.4 ATTENDANCE

Students should be present during at least 7 out of 9 tutorial meetings, and during at least 4 of the 5 lectures. Students who do not meet the attendance requirement have to make an additional block assignment. The block assignment has to be graded satisfactory by the block coordinator before any other part of the grading will be valid.

4. EXAMINATION AND GRADING

At the end of this course there will be a written exam, consisting of open questions. The final grade is the weighted average of the grade for the group assignment (40%) and the grade for the exam (60%). To find further information about the assessment of the group assignment, please refer to Appendix B. Further information about the group assignment is provided in section 8 of this course manual. To pass this course the final grade should at least be 5.50. All grades remain valid up to and including the next two academic years.

5. COORDINATION

Coordinator of this course is Prof. dr. Frank Harmsen. You can contact Frank Harmsen via the secretary's office of the department of accounting and information management (office D2.03, SBE, TS53) or by sending an e-mail to f.harmsen@maastrichtuniversity.nl.

6. TIME TABLE

The table in this section gives a preliminary overview of the lectures and meetings in this course.

	DATE	FORMAT	TOPIC	LITERATURE (TO BE PREPARED BEFORE THE MEETING)
1a	Tue Oct 31	Lecture	Course introduction / Opening Lecture	
2a	Fri Nov 10	Tutorial	Task 1: IT Fashions Case: The Tate's Digital Transformation	Burton Swanson (2012); Wang (2010) Case: The Tate's Digital Transformation
3a	Tue Nov 14	Guest Lecture	Knowledge Management (by mr. Maurice Nijssen, PNA Consulting)	Davenport & Prusak (1998); Nonaka (2007)
3b	Tue Nov 14	Tutorial	Task 2: The (Strategic) Performance Impact of IT Case: Global Knowledge Management at Danone	Mata et al. (1995); Case: Global Knowledge Management at Danone
3c	Fri Nov 17	Tutorial	Task 3: Knowledge Management Strategies Group presentation (more information will follow during course)	Chow et al. (2000); Hansen et al. (1999)
4a	Tue Nov 21	Guest Lecture	Information Systems Development (by mr. Wietse Smid, Capgemini)	Tsun & Dac-Buu (2008)
4b	Tue Nov 21	Tutorial	Task 4: IT Doesn't Matter	Carr (2003); McAfee & Brynjolfsson (2008)
4c	Fri Nov 24	Tutorial	Task 5: Impact of IT on employment Case: Mount Auburn Hospital	Brynjolfsson & McAfee (2015); Frey & Osborne (2013) Case: Mount Auburn Hospital
5a	Tue Nov 28	Guest Lecture	Digital Transformation Management (by mr. Piet Hein Prince, EY)	*Readings will be announced on the course page*
5c	Fri Dec 1	Tutorial	Group presentation	*Readings will be announced on the course page*
6a	Tue Dec 4	Lecture	Closing Lecture	
6b	Tue Dec 4	Tutorial	Course Evaluation & Exam Preparation	-/-

7. TASKS & CASES

TASK 1 – IT FASHIONS

The previous task already established that new technologies are constantly emerging in the marketplace. Managers face one wave of information technology after another. How should managers understand the IT wave phenomenon and cope with it? To deal with this issue, it is important to understand how innovations spread. To understand the diffusion of technology, Burton Swanson has introduced the IT Innovation Wave Complex, a model that identifies four stages in the IT innovation process. Once companies have decided to invest in 'trendy' IT innovations, it becomes interesting to determine what the impact of these investments is.

Before the first tutorial, you should have studied the articles listed below. Make sure you are prepared to discuss the following issues in class:

- What is the IT innovation wave complex?
- How should managers cope with the IT wave phenomenon?
- Should organizations follow IT fashion? Why? Why not?

Literature

- Burton Swanson, E. (2012). The manager's guide to IT innovation waves, *MIT Sloan Management Review*, Vol.53, No.2, p.74-83.
- Wang, P. (2010). Chasing the hottest IT: Effects of information technology fashion on organizations, *MIS Quarterly*, Vol.34, No.1, p.63-85.

CASE – TATE'S DIGITAL TRANSFORMATION

ASSIGNMENT QUESTIONS

- What does the Tate's fifth gallery add to its museum portfolio? What is its value? How well does it help address problems that the four other physical galleries face? How does it open up new opportunities for the Tate?
- What should the role of digital be at the Tate? Which audiences should it target? What should be its strategic objectives?
- What have been the keys to Stack's success during the Tate's digital transformation?
- Assess the feasibility of Stack's vision to make digital a dimension of everything the Tate does. Is this an appropriate goal? What does he need to be more successful in the future?

- Assess Stack's options for monetizing the Tate's digital assets. Which of the options before him are most likely to deliver a return on investment?
- Which of Stack's digital key performance indicators (KPIs) are most and least useful for measuring digital return on investment? Why?

TASK 2 – STRATEGIC INFORMATION SYSTEMS

Some people compare the use of computers (or more generally speaking the use of information systems) with the use of a pen instead of a goose quill: the computer is a tool to perform existing tasks more efficient, just like it's more efficient to write a letter with a pen than with a goose quill. Others assign a much more important role to the use of information technology (IT). They consider IT as a sword, a weapon in the battle against competitors. They argue that strategic information systems (SIS) support or shape corporate strategy and bring forward real-life examples to found this opinion:

(1) Albert Heijn introduces a new Bonus Card

Supermarket chain Albert Heijn began in 1887 with one store. Its small scale made it possible to point out relevant special offers and products to customers personally. Albert Heijn wants to renew this tradition, which is why the company has recently introduced a new version of its Bonus Card. Customers who activate their Bonus Cards online will receive, in addition to the regular Bonus discounts, personal special offers, such as discounts on products that they often buy and discounts on products that Albert Heijn believes are relevant to them. (source: www.ahold.com, adapted)

(2) The Economist[1] published an article about Evolv, a company that monitors recruitment and workplace data. According to Evolv, human-resource managers can make better hiring decisions if they use data mining software. These applications crunch piles of information to spot things that may not be apparent to the naked eye. The company has uncovered some surprising correlations. For instance, people who fill out online job applications using browsers that did not come with the computer (such as Microsoft's Internet Explorer on a Windows PC) but had to be deliberately installed (like Firefox or Chrome) perform better and change jobs less often. Evolv mines mountains of data. If a client operates call centres, Evolv keeps daily tabs on such things as how long each employee takes to answer a customer's query. It then relates actual performance to traits that were visible during recruitment.

[1] The Economist (2013). Robot recruiters: how software helps firms hire workers more efficiently.

(3) Wunelli, a data services company, has developed an interactive telematics app. The app, entitled MORE TH>N DRIVE, offers all drivers the chance to reduce their insurance premiums by up to 20% whilst creating friendly competition by allowing comparisons of driving scores between family and friends, as well as nationally. Drivers simply download the free app for their driving behaviour to be recorded over 200 miles. Once someone has downloaded MORE TH>N DRIVE their driving style is assessed with feedback provided after each journey on how to become a safer driver. A discount of up to 20% is then generated by the UK insurance company MORE TH>N based on factors such as acceleration, braking and speed which can be used when the driver next renews their car insurance. (source: wunelli.com).

Proponents of the 'IS as a sword' theory would probably argue that the above cases illustrate examples of strategic information systems. The resource-based view of the firm provides us with a theoretical framework that can give some academic substance to that claim.

Assignment (Individual)

Analyse the three cases in the task using the resource-based view of the firm. Would you argue that these information systems enhance the competitiveness of the organization? If so, why? Is the competitive advantage sustainable? Be prepared to discuss your solutions in class.

Literature

- Mata, F.J., Fuerst, W.L. & Barney, J.B. (1995). Information technology and sustained competitive advantage: A resource-based analysis, *MIS Quarterly*, Vol.19, p.487-505.

CASE – GLOBAL KNOWLEDGE MANAGEMENT AT DANONE

ASSIGNMENT QUESTIONS

- What are the most important knowledge management challenges faced by Danone? What does the company need to do well to succeed?
- What is your assessment of the Networking Attitude initiative?
- What should Franck Mougin and Benedikt Benenati do next? Which of the three options they are considering (go wider, go deeper, go richer) do you recommend? Why?
- How does CEO Franck Riboud's approach to leading Danone affect your recommendation?

TASK 3 – KNOWLEDGE MANAGEMENT STRATEGIES

Consultancy firm EY has developed elaborate methods to codify, store and reuse knowledge. Knowledge is codified using a "people-to-documents" approach. It is extracted from the person who developed it, made

independent of that person and reused for various purposes. Take the example of Randall Love, a partner in the L.A. office of EY. Love was preparing an important bid for a large industrial manufacturer that needed help installing an enterprise resource planning system. He had already directed projects for implementing information systems for several manufacturers in other industries, but he hadn't yet worked on a manufacturing project in this one. He knew other EY teams had, however, so he searched the electronic knowledge management repository for relevant knowledge. For help with the sales process, he found and used several presentations on the industry – documents containing previously developed solutions – as well as value propositions that helped him estimate how much money the client would save by implementing the system. Because Love reused this material, EY won the project and closed the sale in two months instead of the typical four to six. In addition, his team found programming documents, technical specifications, training materials, and change management documentation in the repository.

Consultancy firm Bain emphasizes personalization of knowledge. They focus on dialogue between individuals. Knowledge that has not been codified – and probably couldn't be – is transferred in brainstorming sessions and one-to-one conversations. Consultants collectively arrive at deeper insights by going back and forth on problems they need to solve. Marcia Blenko, for example, a partner in Bain's London office, had to consider a difficult strategy problem for a large British financial institution. The client wanted Bain to help it expand by offering new products and services. The assignment required geographic and product-line expertise, a broad understanding of the industry, and a large dose of creative thinking. Blenko, who had been with Bain for 12 years, knew several partners with expertise relevant to this particular problem. She left voice mail messages with them and checked Bain's "people finder" database for more contacts. Eventually she connected with nine partners and several managers who had developed growth strategies for financial services institutions. She met with a group of them in Europe, had videoconferences with others from Singapore and Sydney, and made a quick trip to Boston to attend a meeting of the financial services practice. A few of these colleagues became ongoing advisers to the project, and one of the Asian managers was assigned full time to the case team. During the next four months, Blenko and her team consulted with expert partners regularly in meetings and through phone calls and e-mails.

These examples illustrate that knowledge management strategies differ. The conventional wisdom is that these knowledge management strategies are distinct and should not be used concurrently. If this view is correct, it becomes important for organizations to understand which knowledge management strategy is most suitable to them. This may also be impacted by the national culture of the country in which the firm operates.

Literature

- Chow, C.W., Deng, F.J. & Ho, J.L. (2000). The openness of knowledge sharing within organizations: a comparative study of the United States and the People's Republic of China, *Journal of Management Accounting Research*, Vol.12, p.65-95.
- Hansen, M.T., Nohria, N. & Tierney, T. (1999). What's your strategy for managing knowledge?, *Harvard Business Review*, Vol.77, Iss.2, p.107-116.

TASK 4 - IT DOESN'T MATTER

Although the information systems literature provides an abundance of examples of strategic information systems, the strategic importance of IT for companies has been seriously contested recently. Nicholas Carr has introduced a new idea, suggesting that nowadays IT is part of the basic commodities within organizations, comparable to electricity or water. Carr's polemic work became notorious in the information systems community and his 2003 paper quickly became one of the most-cited papers in the field of information systems. If Carr is right, IT would still be vital to the welfare of companies, but it cannot be used by individual companies to gain a strategic advantage over competitors. 'Follow, don't lead' will become the mantra for IT spending. Needless to say that the IT industry mainly disapproved of Carr's article, but that does not mean that there is no academic substance to his argumentation.

Here are some reactions to Carr's work:

- *'Nicholas Carr has foisted an existentialist debate on the mighty information-technology industry... His argument is simple, powerful and yet also subtle.'* - The Economist
- *'Our fundamental response to that is: hogwash.'* – Steve Ballmer (CEO Microsoft)
- *'Carr lays out the simple truths of the economics of information technology in a lucid way, with cogent examples and clear analysis.'* - New York Times
- *'Carr may be early in calling this a turning point for the industry -- for some companies, there probably still is strategic value left to be squeezed out of clever implementation of information technology.'* – Washington Post
- *'Without those individuals who have courage and conviction to lead the rest of us, where would humankind be?'* - Gartner

<u>Literature</u>

- Carr, N.G. (2003). IT Doesn't Matter, *Harvard Business Review*, Vol. 81, Iss.5, p.41-49.
- McAfee, A. & Brynjolfsson, E. (2008). Investing in the IT that makes a competitive difference, *Harvard Business Review*, Vol.86, Iss.7/8, p.98-107.

Assignment (Individual)

It will come as no surprise that the article by Carr (title: IT doesn't matter) has resulted in great turmoil in the IT community. **Find at least three reactions** of major players in the IT world, such as IT companies (e.g. Microsoft, Intel), IT consultancy firms (e.g. Accenture, Cap Gemini/E&Y), research organizations (e.g. Gartner), academics and business journalists. Try to find examples of reactions that agree with Carr and reactions that oppose his view. The following source can be quite helpful for this assignment:

- www.nicholasgcarr.com and www.nicholasgcarr.com/articles/matter.html

TASK 5 - THE FUTURE OF JOBS

In 1933, John Maynard Keynes predicted widespread unemployment 'due to our discovery of means of economising the use of labour outrunning the pace at which we can find new uses for labour'. This quote highlights that the debate over what technology does to employment is already quite old. On one side of the debate are those who worry that technology will erase jobs and lead to massive unemployment. On the other side of the debate are those who say that new technologies will lead to new jobs. Technology advancement should therefore not be seen as a source of anxiety and distress. In the 20th century, the latter group looked to have the better of the debate. Yet, some scholars now fear that the 21st century might become a different story.

In a research paper, Frey & Osborne (2013) examine how susceptible jobs are to computerisation and make an attempt at quantifying the impact of technological progress on the future of employment. Table 1 is based on their study and ranks occupations according to their probability of computerisation.

Probability	Occupation	Probability	Occupation
0.0028	Recreational therapists	0.65	Librarians
0.0035	Healthcare social workers	0.77	Bartenders
0.0039	Dietitians and nutritionists	0.79	Shampooers
0.0077	Archeologists	0.81	Cooks, fast food
0.012	Pharmacists	0.84	Security guards
0.015	Chief executives	0.89	Taxi drivers
0.021	Photographers	0.92	Retail salespersons
0.021	Fashion designers	0.94	Waiters and waitresses
0.17	Firefighters	0.97	Cashiers
0.25	Ambulance drivers	0.98	Loan officers
0.37	Funeral attendants	0.98	Insurance claims and policy processing clerks

0.50	Court reporters	0.99	Telemarketers

Table 1: Impact of computerisation on occupations.

Literature + online sources

- Brynjolfsson, E. & McAfee (2015). Will humans go the way of horses? Labor in the second machine age, *Foreign Affairs*, Iss.4, p.8-14.
- Frey, C.B. & Osborne, M.A. (2013). The future of employment: how susceptible are jobs to computerisation, working paper.

Available on: http://www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf

- McAfee, A. (2013). What will future jobs look like? TED talk by Andrew McAfee in which he elaborates on what future jobs might look like, and how to educate coming generations to hold them: https://www.youtube.com/watch?v=cXQrbxD9_Ng.

CASE – MOUNT AUBURN HOSPITAL

ASSIGNMENT QUESTIONS

- Why are there so many errors in hospitals, where safety and human health are (or should be) the most important things?
- How can IT help reduce adverse drug events (ADEs)? What kind of ADEs, if any, can IT not help with?
- How would you roll out the new POE system at Mount Auburn? Would you start in Labor and Delivery, or elsewhere in the hospital? How would you convince physicians to use the new systems? Would you force them to use it? Could you force them to use it if you wanted to? Would you immediately turn on the system's decision support capabilities?
- How large an impact do you think the new Physician Order Entry (POE) system will have on processes within Labor and Delivery once it is introduced? Once it is rolled out across the hospital, how large an impact will it have on medical errors and patient well-being?
- In addition to a desire to improve patient safety, what other reasons are behind Mount Auburn's decision to implement its POE system? How common are these reasons outside hospitals and healthcare?
- In what ways is the POE effort at Mount Auburn (system selection and implementation) like other corporate IT projects? In what ways is it different?

8. GROUP ASSIGNMENT

The purpose of the group assignment is to cover special topics (not covered elsewhere in the course), that involve state of the art developments in the field of information systems. Like many other business domains, the information systems field is rather susceptible to hypes and fads. IT vendors and consultants use advertisements, white papers, and sales pitches to build interest in new emerging technologies. In the second half of the 1990s, ERP was the buzzword and nearly all large companies have adopted this technology by now. But of course not every technology will ultimately be successful and it is important for managers to be able to distinguish hypes from those technologies that will actually turn out to be competitive necessities. Although there may actually be some benefits of 'chasing the hottest IT'.

Each subgroup is required to give a **presentation** on a **topic of their choice**. Students can choose from the list of suggested topics listed in this section. Instead of choosing one of the topics suggested by the course coordinator, it is also possible to choose a topic yourself. If you want to choose a topic that is not listed in this course manual, you should make sure the topic is approved by your tutor though. **Within one tutorial group, no two groups can present on the same trend.** Your tutor will explain the allocation procedure that will be used to assign the topics.

Deliverables:

- A **45 minute interactive presentation** of the results of your evaluation, with 10 minutes afterwards for Q&A.
- An **executive summary** (about 2 pages) that summarizes your project + **reference list.**
- Please provide your fellow students and the tutor with a hand-out of your presentation.

Questions that you may want to include are:

- How is this technology/trend different from what is currently already available in most organizations?
- Explain the value proposition. How can the use of this tool/technique/trend provide real business value?
- Is this something that will most likely be adopted across the board, or is it especially useful in a particular type of industry/organization?
- Would you seek aggressive adoption/deployment of this tool/trend in order to obtain a competitive advantage, or would you rather take a 'wait-and-see' approach?

A list of suggested readings per topic will be made available on the course page.

SUGGESTED TOPICS

Bring-Your-Own-Device: The growing popularity of mobile devices is opening up intriguing new business possibilities. It's now common practice that employees bring computer tables and smartphones into the workplace. What are the business opportunities that follow from this trend? And how should the IT organization respond? How should companies address security and privacy issues? Should all platforms be allowed (e.g. iPhone? Android? Blackberry?) or should organizations prescribe a single platform?

Cloud computing: A general term for anything that involves delivering hosted services over the Internet. These services are broadly divided into three categories: Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS) and Software-as-a-Service (SaaS).

Data Analytics in the Healthcare Industry: The amount of data in healthcare is increasing at a fast pace. However, in general, the industry has not deployed the level of data management and analysis necessary to exploit those data. The question is how the healthcare industry can take advantage of the promise of data analytics (e.g. predictive modelling, real-time analytics) in a fashion that is also deemed acceptable by society.

Green IT: IT can enable many green initiatives. Common green initiatives include the use of e-documents, reducing travel and teleworking. IT can also provide the analytic tools that others in the enterprise may use to reduce energy consumption in the transportation of goods or other carbon management activities.

Massive Open Online Courses: Distance learning solutions and online educational technologies may not be radically new, but these tools are recently growing in popularity. Nowadays, students can sign up for all kinds of online classes – and often for free. As interest in Massive Open Online Courses (MOOCs) continues to explode, there will be a corresponding need for technology to support these new learning systems.

Text mining: The use of social media has been adopted by many businesses. As a result, a lot of user-generated content is freely available on social media sites. The question is how organizations can monitor and analyse this content. Text mining techniques can be a powerful instrument to extract value from the vast amount of available social media data. One problem with social media texts is however that they tend to be quite noisy. Fortunately, there are a wide range of tools available for text mining purposes, including SPSS Modeler and SAS Enterprise Miner.

Computing everywhere: As mobile devices proliferate, an increased emphasis on serving the needs of the mobile user in diverse contexts and environments is predicted, as opposed to focusing on devices alone.

Phones and wearable devices are now part of an expanded computing environment that includes such things as consumer electronics and connected screens in the workplace and public space. Increasingly, it is the overall environment that will need to adapt to the requirements of the mobile user. This will continue to raise significant management challenges for IT organizations as they lose control of user endpoint devices. It will also require increased attention to user experience design.

The Internet of Things: The network of physical objects or "things" embedded with electronics, software, sensors and connectivity to enable it to achieve greater value and service by exchanging data with the manufacturer, operator and/or other connected devices. Each thing is uniquely identifiable through its embedded computing system but is able to interoperate within the existing Internet infrastructure. Typically, IoT is offering advanced connectivity of devices, systems, and services. The interconnection of these embedded devices, leads to automation in nearly all fields, while also enabling advanced applications like a Smart Grid. Besides the plethora of new application areas for Internet connected automation to expand into, IoT generates large amounts of data from diverse locations that is aggregated at a very high velocity, thereby increasing the need to better index, store and process such data.

APPENDIX A: GUIDELINES FOR DISCUSSING AN EMPIRICAL PAPER

A. Guidelines for Presenting an Empirical Paper

Address the following issues:

- What is the research question?
- Why is the question important?
- What is the theory?
- What are the hypotheses?
- What is the source of data?
- What statistical methods were used?
- What were the key findings?
- What are the implications of the study?
- What are the limitations of the study?
- What future research would you suggest?

B. Guidelines for the Discussion of an Empirical Paper

Consider the following issues:

- Was the purpose of the paper made clear up front?
- Did the first page or two of the paper motivate you to continue reading? Explain.
- Were the theory, constructs and hypotheses well-developed?
- Was the research method and design appropriate to the research question?
- Was the sample appropriate to the research question?
- Was the data properly mapped to the theory, constructs and hypotheses?
- Were the statistical analyses and related inferences appropriate?
- Were there any limitations that should have been acknowledged?
- What would you have done differently?
- Does this paper pass the 'so what' test?

APPENDIX B: GROUP ASSIGNMENT / PRESENTATION EVALUATION FORM

Evaluate the presentation by answering the following general questions:

1. In general, what did I like about the team presentation?
2. In general, what could the team improve?

Please indicate the quality of the presentation on basis of the following criteria.

1 = very bad; 2 = insufficient; 3 = sufficient; 4 = good; 5 = excellent

INTRODUCTION					
The opening of the speech catches the interest of the audience.	1	2	3	4	5
The purpose and structure of the speech is clarified.	1	2	3	4	5
STRUCTURE OF THE SPEECH					
There is a clear distinction between introduction body and conclusion	1	2	3	4	5
Time wise the speech is well organised	1	2	3	4	5
Internal summaries are provided/Transitions from topic to topic are clear	1	2	3	4	5
APPEARANCE AND DELIVERY					
The presentation is free from reading	1	2	3	4	5
The speaker enunciates clearly and speaks loudly enough	1	2	3	4	5
The speaker is aware of his/her audience	1	2	3	4	5
The speaker provides an opportunity to ask questions	1	2	3	4	5
CONTENT OF THE PRESENTATION					
On basis of the presentation, it is clear to me how the chosen technology/trend is different from other technology trends.	1	2	3	4	5
The value proposition is realistic. It is not a sales pitch, but a balanced overview of the benefits/drawbacks of the chosen technology.	1	2	3	4	5
The presentation is free from meaningless buzzwords.	1	2	3	4	5
The implications from the presentation are clear	1	2	3	4	5
Questions are answered adequately	1	2	3	4	5
Additional issues (readings) were discussed; presentation went beyond individual summaries of articles	1	2	3	4	5
USE OF VISUAL AIDS					
The transparencies are readable and clear	1	2	3	4	5
The speaker allows enough time to read the transparencies and/or hand-outs	1	2	3	4	5
The transparencies are effectively used to aid clarity and heighten impact	1	2	3	4	5