BUSI 8205

Reading Notes

These are reading notes to help you with understanding the articles in the course readings. For each lecture and article, there is a note to help you focus on what to understand. Also, there are some review and exam questions for each topic. Use these to check your own understanding. Some of these questions will be used on the final exam. Your instructor will not give you the answers to these, they can be found in the readings. However, your instructor will check and discuss the answers that you come up with. These questions are not required for the course, they are here for your benefit to help you understand the material.

Class 2: Do information systems create business value?

This class features two classic articles that generated a lot of debate and controversy when they appeared and motivated a lot of research into this area. I have chosen these two articles because the question of whether information systems create business value is fundamental, and because the two articles occupy very different positions on this issue.

Nicholas Carr's article was very controversial when it appeared a few years ago and has received many responses. As you read this article, you should focus on first understanding clearly what Carr means when he writes that "IT doesn't matter" and what implications this has for the value it creates for a business and how it should be managed. Second, identify the reasons Carr provides for his argument. What characteristics of IT or businesses lead him to say that "IT doesn't matter". Third, and this is the hardest part, try to identify responses to Nicholas Carr that would prove him wrong. For example, is there something he is missing, or is there some aspect of his argument you find fault with?

Review/Exam questions:

- According to Carr, what are the three core functions of IT?
- According to Carr, what characteristic makes a resource a strategic resource?
- What is the difference between infrastructural and proprietary technologies?
- At what level does Carr suggest the value of infrastructural technologies will be?
- What three suggestions does Carr make for IT management?

Erik Brynjolfsson has written a number of papers on the so-called "productivity paradox", the fact that investment in IT is every increasing, yet, it is unclear whether they actually lead to any improvements in productivity. For a while, the saying went that "we see the computer age everywhere, except in the productivity statistics", indicating that despite their ubiquity, computers and information technology did not make much of a difference to productivity. In this paper, Brynjolfsson and Hitt present some findings of their own studies on this.

Make sure you understand the concept of productivity and its measurement problems. Also, try to understand Brynjolfsson & Hitt's argument about industry versus firm-level productivity measures. This is their justification why we haven't seen productivity increases in earlier studies. Figures 3, 4, and 5 in the article each summarize a section in the paper, one on time-lag of return on investment, one on organizational changes and IT investment and one on complementary asset valuation. Make sure you understand what the article is saying in each of these sections.

Review/Exam questions:

- How is productivity defined?
- Why is productivity hard to measure?
- Why do we need firm-level data, rather than industry-level data to identify productivity increases due to information technology?
- How much of the value of IT is due to the specific business and how much is due to general industry characteristics?
- How much larger are long term benefits from IT than short term benefits?
- What combination of IT investment and decentralization provides the most/least benefits?
- What is the added value of complementary/intangible assets for each dollar of IT investment?

Class 3: Using IT investments to make a difference

The two readings are chosen to highlight the ways in which IT-based investments can have an impact on a firms's performance. The articles take different perspectives, one a macro-economic one, and the other a firm-level one, but we can find significant points of commonality or integration between the two.

McAfee and Brynjolffson's article takes a macro-economic perspective and investigates how IT investment affects the competitiveness of an industry. They look at industry concentration, turbulence, and performance spread as a result of sharply rising IT investments and find that all three indicators have risen sharply since the mid 1990s rise in IT investments, as well as showing differences between low-IT and high-IT industries. Their explanation is that "digital processes" allow a company to propagate innovations widely, rapidly and accurately. We will talk more about processes later in the course. Make sure that you understand not only the three criteria that McAfee and Brynjolffson use, but also the argument why IT investments, via "digital processes", lead to the observed impact on the three criteria.

Given McAfee and Brynjolffson's assertion that industries are becoming increasingly concentrated and turbulent, what does this suggest about Carr's position on the role of IT and how to manage IT investments? Which do you believe is more appropriate?

Review/Exam questions:

- What three criteria do McAfee and Brynjolffson use to investigate the competitiveness of an industry?
- How do McAfee and Brynjolffson argue that IT investments affect the competitiveness of an industry?
- According to McAfee and Brynjolfsson, what three steps are involved when competing on digital processes?
- According to McAfee and Brynjolfsson, what are two important challenges in deploying company-wide information systems?

Rajiv Kohli's article is a case study of UPS that takes a firm-level perspective of identifying IT-based investments to make a competitive difference. It links nicely to McAfee and Brynjolffson's article, who suggest identifying and innovating on IT-enabled opportunities as a second step in their three step prescription to companies. Kohli's approach can be seens as being one approach to do exactly that. Kohli makes two important points. First, the identification of business opportunities is done by means of the value network between a firm and it's partners and customers. The value network shows the flow of goods, information, and money and provides a framework for identifying opportunities (Figure 3).

Second, Kohli makes clear that IT investments by themselves do nothing to improve competitiveness; which we have already seen in the earlier articles by Carr and Brynjolfsson & Hitt and McAfee and Brynjolffson implicitly make the same point. Kohli's answer here is specific in suggesting IT assets and IT competencies as necessary complementary assets, along the lines of Brynjolffson & Hitt's arguments (Figure 4). The article goes on to examine a number of new business opportunities of UPS using these two frameworks.

The organizational infrastructure of processes that Kohli describes is similar to McAfee and Brynjolffson's step of IT deployment, and has to be in place in order to enable new opportunities (or competitiveness, as per McAfee and Brynjolffson). Another link to the earlier article is explicit on page 208, where Kohli suggests that "the brutal truth is that the more successful the business opportunity, the shorter its expected 'shelf life'." This is precisely what McAfee and Brynjolffson examine from a macro-economic perspective.

Review/Exam questions:

- Describe the concept of a value network and describe how it can be used to identify IT-based business opportunities.
- How does Kohli suggest that IT investments can lead to new business opportunities? What factors need to be in place for that to happen?

Class 4: What business value does IT provide?

The two articles chosen for this class focus on identifying what the IT function of an organization can do to provide business value. The first is a somewhat substantial paper on how to measure and communicate the business value provided by the IT function, while the second is a mini-case that deals with the definition of value delivered by IT projects and who is responsible for delivering that value.

The article by Mitra et al. focuses on metrics to measure and communicate the business value of IT. Tradtionally, IT metrics have focused on performance, rather than business value. The primary reason is that the contribution of IT performence levels to overall business value are notoriously hard to quantify, also and perhaps especially in light of the points made by Brynjolffson & Hitt and McAfee and Brynjolffson in previous articles. However, metrics are important in managing and improving performance and value. The article provides a framework for metrics (Figure 1) comprising scope and performance areas, based on interviews with a number with 23 CIOs. The paper then provides examples of CIOs and companies that have used the metrics in this framework to improve the contribution to business value that is made by the IT function. The example cases also provide insight into the different roles that IT can play in an organization; the appropriate metrics are a direct result of what is considered to be the most valuable contribution of IT. This is summarized later in the paper. In a few weeks, we will also see that different roles of IT also have implications for their management and governance. You may wish to keep the five distinct roles in mind and compare them to what is discussed later in the course. The article concludes with some recommendations for CIOs on communicating the business value of IT.

Review/Exam questions:

- According to Mitra et al., what is the difference between performance and value?
- Why are appropriate metrics important in how the CIO can engage other business executives to drive IT business value delivery?
- Describe the two dimensions of Mitra et al.'s performance metric framework? List and describe the different scopes and performance areas of metrics. Give an example metric for each of the 9 combinations.

- What five specific focus domains for IT performance and value have Mitra et al. identified and how are they characterized in terms of their metrics framework?
- Describe three fo the five recommendations by Mitra et al. on measuring and communicating the business value of IT.

Class 5: How IT-enabled business processes create business value

In the previous classes, we have found that Information Technology does deliver business value, but it depends strongly on how the IT is used. This class on business processes and business process reeingineering takes a concrete look at how this works. It ties nicely into the article by McAfee & Brynjolffson on the effects of "digital processes". Here, we examine these digital processes in more detail.

The first article by Michaael Hammer is an introduction to the ideas of business process reengineering. A business process is a set or series of activities that together create an outcome of value to someone, e.g. to a customer or supplier, or even some other department. The article comprises four parts. In the introduction, Hammer talks about why we need to do process reengineering and then provides two examples, Ford and MBL. The next section, essence of reengineering, focuses on the general ideas of process reengineering whereas the following section gives very concrete recommendations on what to do, each with an example. The last section, think big, includes possible problems that businesses encounter when reengineering processes and how to tackle them. When you read the article, you should realize that all or most of the examples that Hammer uses (not just the two main ones) involve the use of Information Technology. You should understand why and how this IT use enables the business to do what they do, and how that was simply not possible without IT. You should therefore also try to identify the business value that the use of IT in each example delivers.

Review/Exam questions:

- What is the relationship between business rules and business processes
- What are the seven principles of reengineering?
- What is the role of IT in reengineering?

The second article by Michael Hammer, almost 20 years later, provides very specific guidelines that help a business to assess how ready it is to engage in business process reengineering and how much performance can be expected from the processes that a business has in place. The article describes in detail, with many examples, the PEMM framework and how it is applied by organizations. Hammer's PEMM framework consists of two parts, process enabler and enterprise capabilities. Make sure you understand how each of these parts works and how these two parts are related.

Review/Exam questions:

- List and describe the five process enablers of Hammer's PEMM framework. Name some of the 13 detailed process enablers.
- List and describe the four enterprise capabilities of Hammer's PEMM framework. Name some of the 13 detailed enterprise capabilities.
- What do the levels P-0, P-1, P-2, P-3, and P-4 say about a process?
- What is the role of IT in Hammer's PEMM framework?

Class 6: IT-enabled Business Process Reengineering

Many statistics from the 1990s indicate that, while process re-engineering is readily accepted by many large and small companies, the success rate of process implementation projects is very limited. This article raises the question why many of the existing re-engineering plans and projects fail and suggests that they lack sufficient depth and breadth. The article presents three case studies to illustrate how sufficient depth (characterized as a set of six "depth levers") and breadth (characterized by the number of involved organizational units) of a process implementation has been successful. In the context of this week's topic, the article shows that the scope (both breadth and depth) of a process implementation project must be go beyond a narrow focus on merely rearranging work. It needs to be concerned with many activities and many functional departments in order to be successful. The six "depth levers" the article suggests also demonstrate that more than just the roles and responsibilities of employees need to be changed. Such large change requires not only sustained top management commitment, demonstrated by commitment of sufficient resources (both people and money) and management communication, as pointed out in this article. It also requires the management of this change, i.e. diagnosis, planning (redesign), change preparation, and subsequent implementation. The three case studies reported in the article are described in terms of these four phases. As you read these cases, focus on the themes of top management support (what were the challenges to overcome by top management? how was this done?), the depth of the process implementation (what types of changes were made?) and the breadth of it (what organizational units were impacted?).

While reading this article (and in your reflection) you might want to think about the following:
- Why is there no company in the top left quadrant in the figure on page 120? How are depth and breadth related? Why?
- The article only provides positive examples, i.e. successful process implementations when the authors expected successful implementations based on their recommendations. Do you think there might be cases when high-breadth and high-depth of process implementations can lead to failure?

Review Questions

- How are breadth and depth of a process implementation defined?
- How is process implementation success affected by breadth and depth?

The second article by Balaji et al. provides a detailed example of IT-based process reengineering. As you read the article, try to relate the problems and the solutions to the points raised by Hammer in his two articles. As much as you can from the information given, what enterprise and process maturity level do you think Sloan Valve is at? What improvements have they undertaken and to what maturity level does it take them? What is still missing or what else could they improve? In terms of Hall et al., do you believe that Sloan's solution has sufficient breadth and depth to have a significant business impact? How do the five "lessons learned" in the article relate to Michael Hammer's seven principles of reengineering?

Class 7: How Enterprise Systems create business value and risks

The previous case study article on Sloan Valve already talked about Enterprise systems or ERP systems. In this class, we look in more detail at what they are, what the business value proposition is, and how they should be managed.

The article by Tom Davenport introduces the idea of Enterprise Systems, also called ERP systems. These are software packages that can support most or all functions of a business and provide an integrated

database into which all information is integrated. After the introduction, Davenport's article has a section on the business value and benefits of ES ("The allure of ES"). Make sure you understand the different ways in which having integrated data benefits the business. The following section highlights some of the dangers or risks ("When systems and strategy clash"), looking at the impact of ES on two different business strategies, differentiation and cost advantage. In the next section ("the impact on an organization"), Davenport examines how business can and do use ES to drive organizational change, showing again that information systems are deeply tied into the structure of businesses. The case study on Elf Atochem illustrates one way of successfully managing and ES implementation. When reading the article, focus on business value creation, business risks, and organizational changes.

Review/Exam questions:

- Define an enterprise system (ERP)
- What type of software is the central core or heart of an Enterprise Systems?
- What three ways are there to configure an Enterprise System?
- What two main impacts on an organization can Enterprise Systems have?

The article by Willcocks and Sykes is interesting because it characterizes a number of frequently encountered wrong approaches, what they term "asleep at the wheel", to ERP implementation. Be sure that you understand the different positions that the IT function and the CIO take in each of these approaches. As you read this, you will recognize that companies find themselves in these positions not because they did something obviously wrong, but because they approached the ERP system from a wrong perspective. Willcocks and Sykes then give a list of 9 capabilities that the IT function needs to have in order to support successful ERP projects. Few of them are directly related to technical capability, and many are related to vendor management. The "wide awake" mode has four important components. As you read the article, make sure you understand why the first three approaches lead to difficulties or failure. Try to identify how the nine IT capabilities address some of the issues with the first three approaches. Also, compare and contrast the successful management style to the first three.

Review/Exam questions:

- Describe the three modes of being "asleep at the wheel" in ERP implementations and the attitude towards ERP systems that gives rise to these.
- Describe the four components of being "wide awake" in ERP implementations.
- Describe the supplier/consultant role in ERP projects and describe the capabilities that the IT function needs to appropriately manage suppliers and consultants.

The article by Strong and Volkoff has very clear prescriptions on what to do and not to do when implementing an Enterprise System. More important than those prescriptions, which the other articles have also already touched on are the six tensions that this article examines in the second half. These are managerial tensions or dilemmas that have no single correct solution. As the authors say: "Six tensions that have no complete resolution but that the organization must manage nonetheless" (pg. 26).

Review/Exam questions:

- Describe the six tensions that Strong and Volkoff suggest exist in an ES project.

Class 8: How Business Intelligence and Analytics create business value and risks

For this class, the focus is on the advanced use of data for making business decisions. Traditionally called business intelligence and rooted in sales and customer service, this idea has now become widely applied in different business areas and the enterprise-wide approach to business intelligence is called analytics.

The article by Davenport introduces the topic and then goes on to describe three key characteristics of companies who successfully apply analytics ("Anatomy of an Analytics Competitor"). He follows this by describing four key business practices required to make analytics successful ("Their Sources of Strength"). Finally, the article notes that getting into the analytics games is not easy and takes considerable time and resources ("The Long Road Ahead"). The side-bar "Things you can count on" provides some examples of how analytics can create business value. Additional examples are found in the text.

Review/Exam questions:

- Briefly define and differentiate between business intelligence and analytics
- List and briefly describe three key attributes of successful analytics companies
- List and briefly describe four key practices for success analytics application
- What are the three aspects of information technology for analytics?
- In a business intelligence context, what does "ETL" stand for and what does it do?

The second reading for this class is a fictional case study of two companies. The retailer, ShopSense, has long been collecting customer data for analytics and regularly sells its data. An insurance company, IFA, wishes to buy this data to supplement its own customer data and better identify the insurance risk of each customer. The case mentions a number of possible problems, legal, ethical, and business issues, with this sale of data. As a supplement, four actual business people comment on the case and make recommendations based on their own experience.

Review/Exam questions:

- Identify at least one legal, ethical, and business problem that might arise from the sale or purchase of customer data.

Class 9: How Customer Relationship Management Systems creates business value and risks

This class focuses on customer relationship management systems. These systems support the CRM function that is traditionally the focus of the marketing and sales function but has links to other areas of the organization as well. After ERP systems, CRM systems are probably the second biggest type of system that organizations can implement, and CRM systems affect a similarly large part of the organization as an ERP system. Consequently, you will find that the benefits and especially the risks and problems are similar to those of ERP systems.

The article by Rigby et al. (2002) article offers four possible mistakes and illustrates each with an example business that was negatively affected. The final example is about how to recover from a failed CRM initiative. The side-bar on page 106 shows some important principles without which CRM system implementations will likely fail.

Review/Exam questions:

- What are the five main principles/imperatives of CRM? Identify at least one way in which CRM software supports each principle.

The second article is a brief case that deals with the challenges of privacy in relation to technology.

Class 10: Governance of Information Technology

The course now moves away from showing how different kinds of information systems generate business value, into how to manage the information systems to ensure that the business value is actually realized. The first topic is that of IT governance, the oversight of everything IT related by the board of directors. Governance is different from management: IT Governance is concerned with controlling and constraining the IT function, while IT Management is concerned with how to actually execute the day-to-day processes that involve IT.

The three articles for this class are all explicitly related: Huff et al. cite the other two articles as motivations and departure points for their study.

The first article for this topic argues that the necessary IT governance differs depending on how companies use IT. Specifically, wether IT is used for strategic defense or offense, and to what extent business are operationally dependent on IT. The authors propose four categories of IT use and illustrate what type of issues need to be addressed by IT governance for each of these categories. Make sure you understand the four categories of IT use and the two dimensions they are based on. Also, you should have an understanding of the five general duties of IT oversight that Nolan & McFarlan propose for board IT committees. Finally, the committee membership and relationship to other bodies is important.

Review/Exam questions:

- Name and describe the four modes of IT strategies developed by Nolan & McFarlan
- Briefly describe four of the five general duties of boards of directors with respect to IT issues

The second article by Huff et al. examines actual practices of boards of directors with respect to IT in two different industries, one that is strategically dependent on IT and another that is not. As a guideline, they use the CICA brochure for IT governance at the board level, which we are also reading for this course. Their findings are that little attention is being paid to IT issues, even for information-intensive industries (see their six generalizations/conclusions on page 60). Huff et al. then compare the actual practices at the board level with the desires of the CIOs of those companies (Figure 2). It becomes clear that most CIOs would prefer more attention at the board level. Finally, Huff et al. provide some suggestions for improving the board's attention to IT matters, though these appear to be easier said than done, and they conclude their article on a disappointing note: "It would be better for today's boards to be proactive, rather than reactive, but this study suggests they are not." (pg. 64).

Given that IT has been used strategically for a long time (Huff et al. cite a 1985 article), why do you think that even 20 years later there is so little attention paid to IT issues? Why do you believe that CIOs would ask for more oversight and control from the board level?

Review/Exam questions:

- Describe four of the six general observations/conclusions that Huff et al. draw about the board-level attention to IT issues.

The third reading is a guidelin from the Canadian Institute of Chartered accountants on IT governance for the board of directors. With specific reference to applicable legislation on board responsibilities, this guide proposes 20 questions in the three categories of strategic planning, control mechanisms, and risk management. The previous reading by Huff et al. makes extensive reference to this guide, so you can just quickly read it over, but make sure you understand why each of the questions is important. Also try to find links between the board agenda and questions for the board that are raised by Nolan & McFarlan in the first article for this class. Is there a large overlap? What questions are in this guide that Nolan & McFarlan have not considered, or vice versa?

Class 11: Business IT alignment

The alignment of business and IT at the strategic and operational level has been argued to be important to business sucess by deriving the most value from IT investments. While the term "alignment" is a bit fuzzy, many authors take it to mean a "shared vision", at least on the strategic level. On the operational level, the term "alignment" is a bit harder to define. The research literature on alignment has examined issues such as what it is, how to build it, what its benefits are, how it evolves, etc. The two articles for this class provide a very brief glimpse into this notion. Both are written from the IT perspective, but, when reading these papers, try to approach it from the other perspective of a general business manager or executive: Given the mechanisms suggested and advice offered, what would you do from the business perspective to drive alignment?

The first article by Preston and Karahanna is related to the Laplante and Bain article for class 4 in that it examines the dynamic between the top-management team and the CIO. Thus, one could dismiss it as another attempt by CIO's to be taken seriously. However, as research shows that business-IT alignment is valuable to the business, the business executive needs to take these lessons seriously. Thus, while the advice is given to CIOs, it is important for the counterpart in the CIO-CEO dyad to be aware of these issues.

Review/Exam questions:

- Briefly describe four of the mechanisms to drive a shared vision and business-IT alignment?
- What are appropriate combinations of those mechanisms, if the CIO or IT leader is unable to apply all six?

The second article by Fonstad and Subramani emphasizes the operational side of alignment. Rather than talking about a shared vision, it emphasizes the involvement of business personnel in IT-related decisions. The main mechanism that is used here is budget allocation and project costing. The notion of alignment here is a bit ill-defined, but it appears to focus on getting business executives to take ownership and responsiblity for specific IT applications (and their associated costs), as a first step in collaborating on identifying and assessing the business case of IT-based opportunities. That being said, the recommendations are still to the IT department, but, just as for the first article, try to see this from the business side as you read the article.

Review/Exam questions:

- Describe the three main recommendatiosn that Fonstad and Subramani make for establishing and increasing enterprise-level Business-IT alignment.

Class 12: Managing the IT function

The first article for this class is located somewhere between IT governance and IT management. It looks at some decisions that should not be made by IT people because they require business oversight. The natural view is to suggest that these are governance issues, though one might also view these in more operational terms as senior management questions. The article itself is rather simple and easy to read. An interesting question you might ask yourself is why do Ross and Weill need to write about this? In other words, why are there companies that let their IT people make these decisions, and is it necessarily/always bad?

Review/Exam questions:

- What six decisions should not be made by the IT department and must be made by business managers?
- What responsibilities should business and IT managers assume, respectively?

The second article is a case study of how the KLM airline changed its IT governance. Faced with outsourcing of the IT function, it describes in detail the mechanisms that KLM has implemented to make IT accountable and controllable by the business and executive levels. It is instructive to compare these to the six decisions in the first article and the governance principles we discussed in class 10. Is there some overlap? If not, why not? Many of these principles can also be viewed from the perspective of Business-IT alignment that we discussed in class 11. This leads to the question about the relationship between governance and alignment: Is governance supposed to ensure alignment? Or is the relationship more complicated?

Class 13: Managing IT

Having talked about the need for business managers to be involved in IT management, this class provides some concrete guidelines and examples of what business managers need to do to make IT initiatives successful and guaranteee the creation of business value. The article by Andrew McAfee is based on the idea that successful IT implementation requires organizational complementary assets. We have seen these assets in the Brynjolffson reading for week 4, where they are valued at significant premium over the IT assets themselves. McAfee picks up on this idea and suggests that different types of Information Technology require different kinds of complementary assets to extract maximum business value. Moreover, business managers need to approach the creation of these assets in different ways.

Review/Exam questions:

- According to McAfee, what are general-purpose technologies?
- What are the four types of organizational complementary assets required to for extracting business value from IT?
- List the three types of information technology and briefly describe their primary purpose. Give one example for each type of technology.
- Which of the three types of IT does not require organizational complementary assets?
- Which of the three types of IT is most difficult to adopt?
- Why is Enterprise IT easier to exploit than to adopt?

The second article for this class is another case study. It deals with selection of a new IT infrastructure. Important questions are whether this should be the CEO's business? Is it a governance or management issue? What, if any, are the business implications? What should the decision process be like? Of course,

the case also poses the immediate question as to what should be done next.

There are no review/exam questions.

Class 14: Managing IT Projects

In this class, we look at the management of specific IT projects. While you may wonder why this is important, as you're unlikely to lead an IT project, there are a number of reasons. First, increasingly, IT projects have a dual leadership, a business sponsor/representatitve, and a technical project lead. In this type of leadership or management structure, the technical lead is typically inward looking towards managing the development team and the technology, whereas the business lead is typically outward looking to managing risks and stakeholders. Second, as a business executive or manager you are likely involved in some parts of the project, either as champion/sponsor/owner, as participant e.g. in requirements definition or testing, as future user, or perhaps as critic/challenger. Any of these are important roles that require some understanding of the issues in IT project management.

The first article by Ryan Nelson is a brief overview over the major pitfalls or mistakes in IT project management. It does not paint a very rosy picture about the state-of-the-art and success rates. However, as the article points out, these are improving. What is important to take from the article is the fact that, even in IT projects, most of the mistakes have little to do with technology or failure of technology. Many of them are basic people and process issues, and as such, are transferable to other kinds of projects in an organization. While the article does not provide much depth on the best practices it advocates, you may wish to follow up on a few of the references, most are to popular literature, rather than research literature.

Review/exam questions:

- Approximately what percentage of IT projects is "challenged", i.e. either over time, over budget or reduced in functionality?
- Briefly describe the four categories that IT project management mistakes can fall into? Name and briefly describe at least one mistake in each of the categories. Which two categories of mistakes are the most widely made mistakes?
- List and briefly describe 5 best practices to mitigate the failure risk of an IT project.

The second "article" is a brochure from the Canadian Institute of Chartered Accountants and outlines the responsibilities that boards of directors should take with respect to IT project governance, especially for large and/or high-risk projects, i.e. risks that could substantially affect the value and/or survival of the organization. The point, as with the previous CICA brochure is not that the board should get involved with the management of projects, but that it has a duty to ask questions and demand answers about the adequacy of the management processes that are in place. Thus, the concern here is not with the technology, but with the management processes.

There are no review/exam questions for this reading.

The final article is a case study on IT project management issues by McNulty. It exemplifies the issues of effective stakeholder management and business case preparation for an IT project, both of which are issues also highlighted in the two previous readings.

There are no review/exam questions for this reading.

Class 15: Managing the IT function

There are two readings for this class (plus a poster that shows the ITIL processes). The first is a brief introduction to the IT infrastructure library, a standard way of managing the IT department to ensure that IT services are available and create value for the business. ITIL is now employed by most IT departments, though frequently adapted or only partially. However, it brings IT one step closer to a disciplined business unit. It makes it less of an art and more a function that can be managed like any other business function, using processes, objectives, and responsibilities. From a business manager's perspective, it is useful to understand how the IT function is managed, as you there are a number of points of contact, e.g. when purchasing services, giving input to change management, using the helpdesk, and others.

The second article on Service-level Agreements (SLAs) shows a managerial tool at the interface between the business department purchasing IT services and the IT department seelling these services. SLAs form the interface between business units and IT departments. They specify what level of performance is bought (and paid for) by the business unit and allows the IT department to focus on delivering the right service at the right level. Thus, both business and IT managers are involved in defining and negotiating these SLAs, as they form a kind of contract between them.

The final poster is useful as a general understanding of what an IT department does (at least with respect to infrastructure maintenance, which typically amounts for more than half of budgeted spending). The second page RACI matrix is instructive because, among many other things, it shows those activities where the business units or departments are involved.

Review/Exam questions:

- What does ITIL stand for? Briefly Define ITIL.
- List and briefly describe the phases of the ITIL service life-cycle
- What is the CMDB and what purpose does it serve in ITIL?
- In what phase of the ITIL life-cycle are the incident management and helpdesk processes/functions?
- What does SLA stand for and what is the purpose of an SLA?
- What does an SLA specify/define?
- What characteristics should a KPI for an SLA have?

Class 16: Identifying and managing IT security risks

While much of the course has so far focused on identifying benefits and business value of IT, IT also creates risks. This class on IT security focuses on identifying and mitigating those risks. The article by Austin & Darby illustrates three kinds of threats to IT security and then provides a set of guidelines on how to manage the IT security risk, suggesting that it can be minimized but not entirely eliminated. The article shows that while IT security is technically complex, it is primarily a business problem as it must be weighted against its costs and business impact.

Review/Exam questions:

- What business effect does a DoS network attack have?
- What business effect could an intrusion attack have?
- What is the difference between an intrusion and malicious code?
- What is the difference between a network attack and an intrusion?

- Why is it important to know exactly what software is running on systems?
- Why should the identification of digital assets not be left to IT staff?

The CICA brochure is intended to make the point that IT security should be taken seriously even at the board level. As the first reading points out, IT security lapses can have severe business consequences and IT use creates business risk. As governance can be viewed as risk management, IT security has implications for governance. As with the previous CICA brochures, you will notice that the emphasis is on asking the right questions, and it's not about technology, but about having processes in place to manage the risk.

The final reading is a fictitious case where a security breach has occurred. While this is a technical issues, the case takes a business perspective and asks what should or needs to be done. For the class discussion, be sure you can describe the company, the situation they are facing in the case, the questions they need to answer and decisions they need to make, the alternatives they have for those decisions and the pro's and con's for each alternative (or the factors that affect the decsion).

Class 17: Identifying and managing IT security risks

This class is a continuation of the topic from the previous class. The first article, by Kayworth and Whitten, to some extent reemphasises the points made in the article for the previous class, but adds more specific mechanisms. Specifically, Figure 1 shows how risk management mechanisms and security objectives come together to yield an effective security strategy. As you read this article, try to relate it to the Austin & Darby article, but also focus on the nine organizational mechanisms the article suggests as being important to implementing a balanced security strategy.

Review/Exam questions:

- Briefly describe the three objectives for an information security strategy.
- Briefly describe three of the nine organizational integration mechanisms (structures and processes) to achieve an effective security strategy.
- Briefly describe two of the four social alignment mechanisms for achieving an effective security strategy.

The second article is another case study of a security breach. Again, while this is seemingly a technical issue, the takes again takes the business perspective. For the class discussion, be sure you can describe the company, he situation they are facing in the case, the questions they need to answer and decisions they need to make, the alternatives they have for those decisions and the pro's and con's for each alternative (or the factors that affect the decsion).

The final article is not really an article, but an overview of the specific security requirements a company must comply with if it wants to process credit cards on their own systems. You do not need to read this carefully; it serves merely as an example of an externally mandated security standard that companies need to comply with (we will take up compliance later in the course).

There are no review/exam questions for the final two articles.

Class 18: Business Continuity and Disaster Recovery

With the increasing reliance of operations on IT, disaster recovery becomes primarily an IT-related issue and activity. The two readings for this class show that, even though it is an predominantly an IT issue, that

does not mean that planning for disaster and ensuring business continuity should be left only in the hands of IT staff.

The article by Junglas & Ives is an interesting case study of Northrop Grumman's disaster recovery efforts after a devastating hurricane. While the description of the disasaster and recovery make for interesting readings, you should focus on the recommendations that the article makes. One important aspect, that is not captured in a bulletpoint or table, is the advice to examine broad categories of disasters, even those that may not be specific to your company's industry. Another important aspect is that disaster preparedness does not imply good disaster recovery if the preparedness plans rest on assumptions that turn out not to be satisfied. The ten lessons at the end of the article exemplify these two aspects and encourage companies to take a very broad look at disaster preparedness and recovery.

The second reading, 20 questions on business continuity planning by the CICA, is more concise in its recommendations. As with the previous CICA brochures, it highlights the importance of business continuity planning at the highest level of firm governance and management. Also, the emphasis of this brochure is not on how to do the business continuity planning, but how to ensure it is done and done well: From the business perspective it is important to ask the right questions.

There are no review/exam questions for this class.

Class 19: Regulatory and legal compliance issues for IT

There are three readings for this class, dealing with compliance. Compliance means that information systems and information systems procedures and processes need to comply with different externally mandated standards. For example, in order to be able to process credit card payments, the IT systems need to comply with PCI standards. In order to store financial data for external reporting, the IT systems need to ensure compliance e.g. with Sarbanes-Oxley act in the US. Relevant compliance issues exist in all industries, for all types of data, and in all countries. On top of that, they tend to be all different between countries and industries, making this all the more complicated.

The first article by Allman looks at compliance from the IT perspective while the second article by Beeler & Garnder give a brief introduction into a few of the more widely applicable laws and acts that mandate compliance and have an impact on IT. The third article by Cannon & Byers gives a brief introduction to show how Microsoft uses information technology itself to manage Sarbanes-Oxley compliance.

Review/Exam questions:

- What is the US regulatory act that applies to financial information and why is it relevant to information systems managers?
- What are HIPAA and HL7 and what are their implications for information systems?
- According to Allman, what are three of the six components of legal and regulatory compliance? Briefly describe each one as they relate to information systems and software
- In the language of the SOX act, what is an IT control? How can necessary IT controls be identified?
- What does validation mean in the context of regulatory compliance and why is it important?
- What possible role can information systems play in supporting SOX compliance?

Class 20: Collaboration and Open Source Development

While the idea of collaboratively developing products is not necessarily tied to information technology or

information systems, it appears that distributed development is more prevalent with products that are software- or information-based. Moreover, collaboration and distributed development requires an appropriate information technology platform or infrastructure to facilitate it. As both articles point out, open source software is an important example of collaborative development, but the structure of open source development projects are not the only ones possible.

The first article by Pisano and Verganti examines different modes of collaboration on product design and development. It is important to understand the two dimensions and the resulting four models of collaboration, their advantages, disadvantages, and the requirements to employ them. As Pisano and Verganti point out, companies need not choose only one model, but can operate in multiple modes, even for a single product, either concurrently or shifting with time.

Review/Exam Questions:
- Briefly describe the two dimensions of collaborative development and the four resulting collaboration modes resulting from these
- Describe some issues (benefits, drawbacks, requirements) that are important in choosing open versus closed modes of collaborative development
- Describe some issues (benefits, drawbacks, requirements) that are important in choosing flat versus hierarchical modes of governance in collaborative development

The second article is a small fictitious case on a music software company that faces the challenge of its core software product being popular with amateur or independent software developers who are copying core features, because they are apparently unable to otherwise extend or adapt the product. The company faces the question of whether to "open source" their software to allow a more open, collaborative, development.

Review/Exam Questions:
- What is open-source software? Briefly describe some of the advantages and disadvantages or challenges of "open sourcing" a core product.

Class 21: Social Media and Social Networking

Much of this topic may be more suitably discussed in a marketing or communications course, because the main managerial issues are not technology related, though of course this domain is technology-enabled and thus of some interest.

The first article by Culnan, McHugh and Zubillaga provides some guidance on how to derive value from social media. The two key issues are to attract a sufficiently large community and to put in place processes to manage this community. To this effect, the article suggests three main steps. First, organizations need to make a conscious decision to adopt social media, including being clear about the media, the responsibilities, and the goals and metrics. Second, organizations need to engage in community building by offering content, recognizing participants, and providing standards and guidelines around the use of the social media. Finally, processes need to be in place to receive and manage ("absorb") the communications from the community and translate this into business value. This includes responsibilities for monitoring, responding, and reporting.

Review/Exam Questions:
- Briefly describe two essential characteristics of effective social media use
- Briefly describe the three main elements of an effective social media implementation strategy

While the first article focused on generating business value from the use of social media, the second article focuses on the business risks that these media pose. It is instructive to compare the recommendations of this second article to the recommended strategies of the first. Also, while Culnan et al. touch on risk management, this article and its recommendations provide some more depth on this issue.

The third article is a small fictitious case study of the use of social media. Here, too, social media represent a threat to the organization that must be addressed. It might be instructive to examine this case from the perspective of the social media implementation strategy advocated in the first article and the recommendations to reputation threats in the second article. For example, does the company appear to have elements of a social media strategy in place? Could some of the recommended responses be useful in this situation? Which ones?

There are no review and exam questions for the second and third article.