European Collaborative Innovation Centres for Broadband Media Service

university of groningen

Education and the iPad

Exploring the opportunities of Tablet PC technology at FEB

Case Study

October 2011
Kristian Peters – Lecturer/Researcher - University of Groningen

EUROPEAN UNION
European Regional Development Fund

The Interreg IVB North Sea Region Programme

1 Executive summary

This case study explores the possibilities of employing Tablet PC technology in education at the Faculty of Economics and Business (FEB) at the University of Groningen. The contents of this case study have been based on assignments about this subject for the FEB course “Business & ICT” and made by BSc students at FEB. Operationally, tablet PC technology is positioned as a tool that supports and enhances both traditional classroom teaching as well as e-learning and distance learning. The technology further offers possibilities to support and enhance organizational processes at the tactical level of FEB, such as faculty-wide communication and educational quality control. The possibilities of Tablet PC technology at the operational and tactical level form the basis for the potential strategic value of this technology for the FEB and the University of Groningen. Current developments show that future students are already embracing Tablet PC technology, which will accelerate the acceptance of the technology in the learning environment. The developments also indicate that enterprises will adopt Tablet PC technology in the future. Students want to be trained in the technologies used in their future jobs. The FEB could embrace Tablet PC technology in education and create a considerable strategic advantage by offering a unique and effective learning experience.

2 Problem statement

The University of Groningen (founded in 1614) is an international research university located in Groningen, The Netherlands. According to its mission statement, the University of Groningen provides high quality teaching and research, is internationally oriented, respects differences in ambition and talent, works actively with businesses, the government and the public, and ranks among the best universities in Europe. The University of Groningen strives for an international "top 100 position" in most disciplines.

The Faculty of Economics and Business (FEB) is one out of nine faculties of the University of Groningen. The mission of FEB is threefold: 1) to prepare students for a career in research or a leading position in the corporate or public sector through high-quality, research-based degree programmes in the fields of economics and business, 2) to contribute to the advancement of knowledge in these fields by conducting high-quality research, and 3) to provide a stimulating and international environment for staff and students. To accomplish this mission, the FEB has adopted a multi-faceted strategy that concentrates on aspects such as quality monitoring, internationalization, and tenure track staffing. Information and Communication Technology (ICT) has a less prominent role in FEB's strategic plans (2010-2015). It is mentioned in relation to the faculty's facilities, which, obviously, FEB wants to have aligned with the needs of students and staff.

Recent initiatives at FEB, however, indicate that FEB embraces innovative developments in ICT. For instance, the FEB facilitates the recording of lectures now, so that lectures are accessible through the Internet (eClic presentation by Albert Kerkhof, April 2011). Furthermore, in 2012 the Donald Smits Center for Information Technology (the CIT), responsible for all ICT facilities at the University of Groningen, will offer staff members the option to choose for a smartphone rather than the traditional desk phone (UK, 22 September 2011[1]). This case study explores whether ICT can have a more prominent role in FEB strategic plans. The study particularly concentrates on the possibilities of a relatively new information technology, the Tablet PC.

Although the first Tablet PCs were unveiled in late 2002 (Gill, 2007), the technology came into fashion in 2010 by the introduction of Apple's *iPad*. Recently, the CIT announced that "The use of tablets – and particularly the iPad – by University staff and students has grown substantially and within a short period of time"[2].The two unique characteristics of the Tablet PC are: 1) Tablet PC technology allows a user to control and interact with the computer by using a touch screen, and 2) Tablet PC technology has a small form factor. These characteristics make a Tablet PC suitable for a number of activities that are impracticable on traditional desktops or laptops. Moreover, Gill (2007) argues that the unique capabilities make the Tablet PC highly suitable for instruction-related activities.

The aim of this case study, therefore, is to explore the (strategic) possibilities of employing Tablet PC technology at the FEB for educational purposes. The question that guides this case study is:

[1] http://issuu.com/universiteitskrant/docs/universiteitskrant05-jg41/5 (accessed 13 October 2011)
[2] http://www.rug.nl/cit/portfolio/diensten/tablets/index (accessed 13 October 2011)

To what extent can Tablet PC technology play a strategic role at FEB by utilizing it in the educational setting, and how?

Method
BSc Business Economics students and BSc Accountancy and Controlling students at FEB have been asked to answer this question and formulate their answers in a memo, which was fictively addressed to the faculty board of FEB. The assignment was given in the second and third year's BSc courses "Business & ICT". Ten memos have been selected and used, based on the final grade (at least 8 or higher; maximum grade was 10) and the usability in relation to the purposes of this case study. The selected memos form the foundation of this case study.

It should be noted that this case does not consider economic aspects of employing Tablet PC technology in education (see also section 5).

3 Alternatives and considerations

From a theoretical point of view, the Information Systems Strategy Triangle (ISST) of Pearlson and Saunders (2009) guides this analysis. The ISST links the business or corporate strategy with the organizational strategy and information strategy of an organization. The use of ISST is done to suggest that all three points are in balance in any organization, and if they are out of balance, then organizational tension or possibly crisis exists. An organization is out of "alignment" when its strategy is not supported by their Information Systems (IS). Beside IT, IS covers organizational processes and people. To review opportunities of new technology, the triangle departs from the business or corporate strategy of an organization. Consequently, the business or corporate strategy drives organizational and information strategy. Following the ISST, the upcoming subsections describe the possibilities of Tablet PC technology deployment at FEB on three levels, namely the strategic level, the tactical level and the operational level. The extant vision, mission and strategy of the University of Groningen and FEB are the starting points; they form the basis of considering the strategic value of Tablet PC technology in education at FEB.

3.1 Strategic level

According to Porter's generic strategies model, IS can drive a strategy in two ways. IS can either help organizations to gain a competitive advantage through cost leadership by becoming more efficient, or help organizations to gain a competitive advantage through differentiation by offering products or services that are unique in the market or in a niche. The strategy of both the University of Groningen as well as the FEB can be classified as a differentiation strategy. The current strategy is focused on differentiating through educational and research quality, e.g., the aim to acquire a "top 100 position" in most disciplines. Following the ISST, the strategic utilization of Tablet PC technology should contribute to the overall strategy, and hence, the technology's worth for the FEB should be sought in the distinguishing capacities of the Tablet PC. Obviously, differentiation alone is insufficient to gain a competitive advantage: the service or product should be perceived as both unique as well as valuable by potential customers. The strategic value of technology becomes apparent and concrete on the tactical

and operational levels. However, before I discuss these two levels, I describe two essential developments that provide a basis for the projected strategic value of Tablet PC technology at FEB.

A first and essential development is that, on the short term, the usage of Tablet PC technology will increase with respect to household consumers. Gartner predicts that "By 2015, we expect more than 50 percent of PCs purchased for users under the age of 15 will have touchscreens, up from fewer than 2 percent in 2009"[3]. Initially, such an increase in Tablet PC technology usage is not expected in enterprises. This is due to the slow adoption of new technology in enterprises and uncertain business cases for adopting Tablet PC technology. However, Gartner observes that "[…] the younger generation beginning to use touchscreen computers ahead of enterprises […]" and "employees are increasingly bringing their own PCs and technologies to work […] and as with other consumer technologies, enterprises will eventually be forced to acknowledge the use of touch for their mainstream knowledge users"[4]. Consequently, two developments can be observed. First, in the near future, aspirant students will be highly accustomed to working with Tablet PC technology (or in a broader sense, Touch technology). Secondly, on the long-haul, it is highly likely that enterprises will embrace Tablet PC technology.

These two developments could lead to two types of demands in the market for higher education. First, students could prefer universities that offer educational tools that are familiar to them, such as Tablet PC technology, over universities that employ traditional (or unfamiliar) tools in education. Obviously, whether such demand comes into being, remains speculation. What is less speculative, however, is that the acceptance of Tablet PC technology by students will be less problematic because they are already used to the technology. The development that youngsters are accustomed to Tablet PC technology can therefore be regarded as an enabler for the technology in education at FEB. It enables the creation of an effective learning environment through Tablet PC technology

The second type of demand relates to content of the study as demanded by students. Aspirant students in economics and business want to be trained optimally with respect to the methods and practices they have to work with in their future careers. If the digitalization in business practices continues, and the use of Tablet PC technology in enterprises becomes more intensive on the long haul, a demand for education in these technologies comes into being. The FEB can anticipate on this development by already embracing Tablet PC technology. As far as I know, the FEB would be the first faculty in the Netherlands that would deploy Tablet PC technology. Tablet PC technology therefore presents an opportunity to reinforce the differentiation-oriented strategy of the FEB through ICT. However, the strategic value becomes clear when we regard the implications of Tablet PC technology on the tactical and operational levels of FEB. The next subsection concentrates on the tactical level.

3.2 Tactical level

According to the ISST (see above), the tactical level of the FEB comprises the organizational strategy. The organizational strategy includes the organization's design, as well as the managerial choices that define, set up, coordinate, and control it work processes (Pearlson and Saunders, 2009). With regard to

[3] Source: http://www.gartner.com/it/page.jsp?id=1336913 (accessed 13 October 2011)
[4] Sources: http://www.gartner.com/it/page.jsp?id=1336913 (accessed 13 October 2011) and http://www.guardian.co.uk/technology/2011/sep/22/tablet-forecast-gartner-ipad (accessed 26 October 2011)

the employment of Tablet PC technology at FEB, especially the co called “control variables”, are of interested because Tablet PC technology can improve communication, and the processing of data, planning and performance measurement and evaluation within FEB.

First and foremost, Tablet PC technology in an educational environment offers a vast palette of possibilities for collecting data about progress and feedback of students. Educational quality is a highly important subject at FEB. FEB employs several methods and tools to measure educational quality. The quantity and quality of students’ feedback is however disappointing: response rates of post-course evaluation surveys are generally low and the quality of the feedback content is mediocre (source: Teaching Quality Discussion FEB, October 2011). The FEB is currently evaluating ideas to improve the system. The most important idea for improvement concentrates on increasing the awareness of students that providing feedback contributes to the quality of teaching at FEB. For instance, the students should be informed about the course evaluation results and the teacher and course coordinator’s reactions on the feedback (e.g., improvement plans). This information should be offered at frequently-visited and convenient places on the FEB Internet pages (e.g., on the respective course page in Nestor). Tablet PC technology could play a significant role in disseminating information about course evaluation results and teacher improvement plans. More importantly, however, is that Tablet PC technology can improve the collection of evaluation data from students more frequently and in a manner that is more convenient to students. Through Tablet PC technology it becomes possible to collect feedback information immediately after each class, practical, tutorial or exam. In combination with the traditional post-course evaluation, the reliability and validity of course evaluations can increase drastically. Additionally, teachers can use the intermediate evaluations (post-class) to adjust or improve the classes during the semester rather than in the next academic year.

Communication and social networks within FEB can profit from Tablet PC technology as well. Currently, the FEB website, Nestor electronic blackboard and, for staff, the FEB Intranet are the primary sources to inform students and staff about actual faculty news, events, schedules, up-to-date building information, etc. This information is currently only accessible when a student or staff member uses a smartphone or a traditional desktop/laptop computer. For a large faculty with students travelling to the FEB from various locations, following various courses at various locations at FEB, discussing group assignments at various locations at FEB and studying course books in preparation for exams at various locations at FEB, Tablet PC may further contribute to the actuality and dissemination of information, hereby contributing to the dynamic community the FEB aims to facilitate.

In sum, the FEB aims at differentiating strategically by offering high quality education to students. To achieve high quality education, quality control and up-to-date real time communication and information sharing are essential. Until now, the quality control mechanisms of the FEB have not functioned effectively. The employment of Tablet PC technology may significantly improve it by offering students a more convenient way to evaluate courses. On top of that, it becomes possible to evaluate courses more frequently: rather than evaluating a course after the (half) semester, Tablet PC technology enables students to evaluate educational quality after each course event. Furthermore, the results of course evaluation and teacher’s feedback and improvement plans can be disseminated effectively, which points to another tactical advantage of Tablet PC technology. That is, Tablet PC technology enables the FEB to reach students and staff at any moment of the day regardless of the location and/or the availability of traditional communication devices. It hereby contributes to a dynamic and lively student-staff community.

3.3 Operational level

Besides on the tactical level, the strategic value of technology becomes apparent and concrete on the operational level. The aim is to create a unique and effective learning environment using Tablet PC technology. I start off from the current situation, i.e., traditional classroom learning.

Traditional classroom learning has multiple advantages: It facilitates immediate feedback, it is familiar to both instructors and students, it motivates students and it cultivates the social community (Zhang et al., 2004). The introduction of ICT into the educational environment is known as e-learning. Zhang et al. (2004) defines e-learning as "technology-based learning in which learning materials are delivered electronically to […] learners via a computer network"[5] (p. 76). For a while ICT could not offer the same advantages as traditional classroom learning. Sections 3.1 and 3.2 however pointed out that Tablet PC technology is already used by aspirant students, hence, it is not unfamiliar to them, and that Tablet PC technology can cultivate the social community. With respect to the latter, social network sites such as Facebook and Twitter can be regarded as killer applications of Mobile and Tablet-PC technologies.

Especially the lack of immediate feedback in asynchronous e-learning is considered as a disadvantage of e-learning (Zhang et al., 2004). The main reason for this is that traditional PCs and laptops are less suitable devices to facilitate synchronous learning. They are hard to bring to the classroom (i.e., the mobility property) and less suitable to interact with in a classroom setting (i.e., the interaction property). Tablet PC technology however, enables synchronous learning, while combining the advantages of traditional classroom learning with the advantages of e-learning (see below). It allows students and teachers to control and interact with the computer by using a touch screen, hereby making the Tablet PC an effective note taking device (Moore et al., 2009; Moore et al., 2010). With respect to mobility, Tablet PC technology beats all traditional PC technologies. Furthermore, Moore et al. (2010) found that Tablet PC technology can serve as a high-resolution course content viewing device and a tool for interactive assessments.

Additionally, Tablet PC technology makes it possible to buy course-books on the digital format, which can lead to substantial cost reductions. Simultaneously, it offers the FEB more and cheaper possibilities to put together text-books that are tailor-made for the course (e.g., combining chapters from different books). Students can bring along their tailor-made course-books in the digital format to the classroom. During class, the teacher is able to directly link to passages from the book, integrate these seamlessly in their Powerpoint presentation slides, which, obviously, is also directly available on students' tablet screens. Students are able to browse through the presentation slides and make digital notes during class.

When considering two major disadvantages of traditional classroom learning, it becomes clear that Tablet PC technology can be valuable too. Firstly, traditional classroom learning has as disadvantage that it is mainly instructor-centered. The student is passive, and has low levels of choice and power. The FEB aims at providing education following the student-centered learning. In student-centered learning, the student's choice and action are central in education (O'Neill and McMahon, 2005). The student is active, and has high levels of choice and power. Motschnig-Pitrik and Holzinger (2002) note that

[5] Zhang et al. (2004) refers to "remote learners" in their definition of e-learning (p. 76). I do not agree with them that the learners are remote per definition. I therefore omitted "remote" from the definition.

student-centered learning is "more demanding in terms of communication, organization, as well as the provision of learning material" (p. 160). Tablet PC technology can enable more effective interaction and communication in and outside the classroom. Van Diggelen (2011) found that students who used collaborative tools that supported small-group discussions in the classroom could work at their own pace and could express their thoughts without being interrupted. Furthermore, Van Diggelen (2011) saw that students who hardly said anything verbally in the classroom or in group discussions outside the classroom, frequently communicated digitally through the IT tools.

Secondly, traditional classroom learning is restricted by time and location constraints. The FEB still regards classroom learning and face-to-face education, i.e., physical student and teacher interaction, as highly important. Nevertheless, Tablet PC technology offers possibilities to exploit the benefits of distance learning in combination with traditional classroom learning and face-to-face education. Distance learning is the "process of transferring knowledge to learners who are separated from the instructor by time and/or physical distance and are making use of technology components"[6]. It offers students flexibility with regard to when and where they want to study or work on an (group) assignment. Whereas traditional PC technology (desktop and laptop) already supported distance learning, the other advantages of Tablet PC technology, especially those that can be employed in the classroom, may make distance learning even more attractive and less different than the traditional methods.

4 Conclusion

This case study explored the possibilities of employing Tablet PC technology in education at the Faculty of Economics and Business (FEB) at the University of Groningen. The contents of this case study have been based on assignments about this subject by BSc students at FEB. Operationally, tablet PC technology is positioned as a tool that supports and enhances both traditional classroom teaching as well as e-learning and distance learning. The technology further offers possibilities to support and enhance organizational processes at the tactical level of the FEB, such as faculty-wide communication and educational quality control. The possibilities of Tablet PC technology at the operational and tactical level form the basis for the potential strategic value of this technology for the FEB and the University of Groningen. Current developments show that future students already embrace Tablet PC technology, which accelerates the acceptance of the technology in the learning environment. The developments also indicate that enterprises will adopt Tablet PC technology in the future too. Students are the future employees in business and other organizations. They want to be trained in the technology used in their future jobs. The FEB could embrace Tablet PC technology in education and create a considerable strategic advantage by offering a unique and effective learning experience.

5 Implementation

The students that wrote the assignment for the Business & ICT course have not explored the introduction of Tablet PC technology financially. Obviously, the financial aspects of this technology are essential and should therefore be investigated in future studies. The investments will be substantial. For

[6] Source: http://www.distance-learning-college-guide.com/what-is-distance-learning.html (accessed: 26 October 2011)

instance, the price of the newest iPad, the iPad 2, ranges between €479 and €799 depending on the model and options. Each student at FEB should purchase a Tablet PC; for them it is a huge investment. Future feasibility studies should explore the price advantages of buying in bulk and take into consideration the price advantage of buying digital course books rather than the traditional (and expensive) paper course books. With regards to other necessary IS infrastructure, such as wireless networks and support staff, much is already in place at FEB. Other costs therefore are expected with regard to training teaching staff and acquiring licences for using specific classroom software.

6 Participants

FEB BSc Accounting & Controlling students and FEB BSc Business Economics students participating in the course "Business & ICT".

7 References

Gill, T.G. (2007) Using the Tablet PC for Instruction. *Decision Sciences Journal of Innovative Education*, Vol. 5, No. 1, pp. 183-190.

Motschnig-Pitrik, R. and Holzinger, A. (2002) Student-Centered Teaching Meets New Media: Concept and Case Study. *Educational Technlogy and Society*, Vol. 5, No. 4, pp. 160-172.

O'Neill, G. and McMahon, T. (2005) Student-centered learning: What does IT mean for students and lectures? In: *Emerging Issues in the Practice of University and Teaching*. O'Neill, G., Moore, S. and McMullin, B (eds.) Dublin: AISHE.

Pearlson, K.E. and Saunders, C.S. (2009) *Strategic Management of Information Systems*. Fourth ed., Hoboken, NJ: John Wiley & Sons.

Van Diggelen, W. (2011) *Changing Face-to-Face Communication: Collaborative Tools to Support Small-group Discussions in the Classroom*. Doctoral dissertation, SOM research school, University of Groningen.

Zhang D., Zhao J.L., Zhou L. and Nunamaker Jr., J.F. (2004) Can E-Learning Replace Classroom Learning? *Communications of the ACM*, Vol 47, No. 5, pp. 75-79.