INFORMATION SYSTEMS EDUCATION JOURNAL

In this issue:

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An IT Strategy Course: Why and How

David M. Woods
woodsdm2@miamioh.edu
Computer & Information Technology Department
Miami University Regionals
Hamilton, OH 45011, USA

Elizabeth V. Howard
howardev@miamioh.edu
Computer & Information Technology Department
Miami University Regionals
Middletown, OH 45042, USA

Abstract

With continuing changes in all aspects of the technology field, especially the emergence of cloud and "as a service" offerings, developing skills for strategic thinking about technology is of increasing importance to our students. However, the presence of formal IS/IT strategy courses in programs of study trails that of more traditional courses. In addition, there is limited discussion on the teaching of strategy in the academic literature. This work offers reasons for the continued importance of teaching strategy and provides examples of how strategy is covered in a course on Global and Strategic Issues in IT.

Keywords: IT Strategy, Active Learning, Experiential Learning, IS Curriculum, Pedagogy

1. INTRODUCTION

The topic of strategy is explicitly included in the IS 2010 curriculum (IS 2010) through the IS 2010.7 IS Strategy, Management, and Acquisition course that is recommended for all IS Majors and Minors. Core elements of strategy are also related to several of the pervasive themes of "user centeredness and advocacy," "professionalism (life-long learning, professional development, ethics, responsibility)," and "interpersonal skills" mentioned in the IT 2008 curriculum (Information Technology 2008).

Despite this, several recent reviews IS programs have found a limited presence of strategy courses in these programs. Additionally, a review of the published literature found few examples discussing how strategy is being taught in IS and IT programs.

The emergence of technologies such as, Software as a Service, Infrastructure as a Service, Platform as a Service, and big data allows IS/IT departments new opportunities for growth. Effectively using these new technologies requires a focus on strategic thinking. We will share an overview of the design of our course, Global and Strategic Issues in IT, as well as specific activities and assignments intended to encourage strategic thinking.

2. STRATEGY IN THE CURRICULUM

The IS 2010 curriculum includes IS 2010.7, IS Strategy, Management, and Acquisition as one of seven suggested core courses. The high level course description provided for IS 2010.7 mentions several topics related to strategy including "IS strategic alignment," "strategic use of information," "IS Planning," and "Using IS/IT

governance frameworks." IS 2010.7 is one of three courses recommended for all IS majors and minors.

While the IT 2008 curriculum does not include a specific strategy course, strategy would fit in the IT Capstone courses described in the Integration-First Approach or the Social and Professional Issues in IT course from the Pillars-First Approach (Information Technology 2008).

The IS2010 curriculum was the first major revision in almost 10 years and included significant changes. Given the competing demands on faculty time, it would not be surprising if it took some time for major additions like the IS2010.7 course to make their way into programs of study.

A review (Apigan & Gambill, 2010) of programs at 240 colleges and universities assessed these programs in view of the IS 2009 working model curriculum. This review found the IS2009.7, IS Strategy, Management, and Acquisition course in only 35.4% of the programs reviewed. Of the seven core courses in the curriculum, the only course found in fewer programs was IS 2009.3, Enterprise Architecture, which was present in 20.6% of the programs. For comparison, the IS2009.4 IS Project Management course was found in 53.8% of the programs studied, and the remaining IS2009 core courses were found in at least 83% of programs.

Studies of the final IS 2010 curriculum find similar results. A study of 127 AACSB accredited undergraduate programs (Bell, Mills, & Fadel, 2013) found the core IS 2010.7, IS Strategy, Management, and Acquisition course in only 29 % of programs. Again, only IS 2010.3, Enterprise Architecture, was found in fewer programs (17 %). On the other hand, four of the core courses were found in at least 70 % of the programs.

A study reviewing the presence of IT 2010 curriculum elements in 37 ABET accredited programs (Feinstein, Longenecker, & Shrestha, 2013) found the IS 2010.7 and IS 2010.3 courses were found in only 10 of the 37 programs reviewed.

While the data shows a limited presence of courses matching the IS 2010.7 IS Strategy, Management and Acquisition course, this doesn't exclude that potential that topics related to IS strategy may be covered in other courses.

3. WHY TEACH STRATEGY?

To frame this discussion, a definition of strategy is useful. For our purposes, we define strategy as the efforts related to developing a high level plan to achieve goals in an uncertain environment. For the IS/IT field, strategy must be discussed in terms of supporting the overall strategy of a business or other organization.

This definition of strategy is in agreement with several of the guiding assumptions of the IS 2010 curriculum, which include that "students must therefore understand that:

- Information systems in organizations have increasing strategic significance ..." (IS 2010, p. 8)
  and
- "Focus on the application of information technology in helping individuals, groups, and organizations achieve their goals within a competitive global environment. " (IS 2010, p. 8)

In addition to its inclusion in the IS 2010 curriculum, there is other evidence of the importance of strategy in the IT field from discussions about the role of the Chief Information Officer (CIO). Gefen et al. (Gefen, et al. 2011) report on a CIO roundtable discussion and note "a shift in the role of the CIO from IT service provider to business integrator" along with other observations that indicate an increasing need for strategic skills.

Discussions on the role of the CIO can also be found in higher education. Voss and Wheeler (Voss & Wheeler, 2010) initiated a debate framed around the concept of "CIO as plumber" with a focus on operational aspects of technology and "CIO as strategist" with a focus on the use of technology to achieve an institution's strategic goals. As this discussion has evolved (Voss, 2014a; Voss 2014b), the value of both roles has been acknowledged. Also mentioned

> "pressure on our profession to separate into two or more parts: the part that keeps the lights shining and things in compliance; and the other parts that direct another type of light (information technology) into new places to address the disruption and enable the transformation." (Voss, 2014a, para 9)

Clear risks are seen in fragmenting the CIO role, reinforcing the need for IS/IT professionals to be able to think and act strategically.

Another consideration in developing skills related to strategy is that students can apply the same skills to career planning, lifelong learning, and professional development since all of these involve planning for achieving a goal in an uncertain environment.

4. AN OVERVIEW OF THE COURSE

In the Computer and Information Technology Department at Miami University, students have the opportunity to learn about strategy in a 400 level course addressing Global and Strategic Issues in IT (see appendix for an outline of the course). In this course, students learn how to identify and adapt to the cultural differences found in today's world. There is specific emphasis on understanding how technology is used in different parts of the world, and developing the skills needed to understand, assess, and make informed decisions about global technology issues. The course satisfies a Miami University Liberal Education requirement in the Global Perspectives category, which requires that courses be designed "to have a global perspective and help students develop the ability to communicate and act respectfully across linguistic and cultural differences." (Miami Global Perspectives, n.d.)

As previously described in more detail (Howard et al., 2012; Howard & Petrone, 2010), we designed the course around Bloom's learning domains: *Cognitive* through lectures and reading; *Affective* through reflections and discussions, and *Psychomotor* through simulations, activities, and applications to the students' own work (Bloom et al, 1956). Toward the end of the semester the activities and assignments encompass a synergy of all three domains. For the first third of the course, students research and participate in activities that facilitate learning about their own cultural orientation, the culture of specific USA-based technology corporations, the culture of the USA, USA demographics, and the IT Infrastructure of the USA. During the last two-thirds of the course, each team of students studies three countries: one of the BRICI countries (Brazil, Russia, China, India, Indonesia) because of their importance as emerging world economies as well as two other countries. The teams begin by researching the culture and demographics, and

then move on to the many aspects of the IT infrastructure covered in the course.

For strategy, the main skills that students develop are the collecting and analyzing of data to develop recommendations. An important part of this involves learning about useful sources of strategic information about technology. Fortunately, there are a number of strong resources, starting with strategy consultancies. Gartner (www.gartner.com) and McKinsey (www.mckinsey.com) both offer some information with a free registration. Additional information is available to clients – check with your school's Information Technology group to see if they are clients of Gartner or McKinsey. Educause (www.educause.edu) provides information specific to technology use in higher education to members, which includes many higher education institutions. Local CIOs and senior IT leaders are also good sources for ideas on emerging technologies and strategic IT topics.

Additional discussion of strategic issues in information technology can be found in the information technology trade press, including *Information Week* (www.informationweek.com) and *CIO* (www.cio.com) magazine. More general business oriented publications such as the *Economist* (www.economist.com) also offer detailed analysis of the impact of technology on business. A good source of discussion topics are annual top-10 lists that can be found in several sources. Two good sources are the annual Educause Top-10 list (Grajek, et al., 2014) and the NMC Horizon Report for Higher Education (Johnson, et al., 2014) which are focused on technology in higher education and are likely to cover technologies with which students are more familiar.

Throughout the semester, classroom activities introduce students to specific topics related to global, cultural, and strategic issues in IT. Activities related to strategy reinforce the need to relate the use of technology to meeting the strategic goals of an organization or business. Emphasis is also given to having students develop skills for keeping up to date on emerging technologies and finding information about the use of technology in a specific industry.

Teams of students work together to apply the skills learned in class to collect and analyze data for presentations on a series of increasingly

complex questions about the countries that they are studying. This leads to a final presentation where each team presents three ideas for potential IT projects to a hypothetical USA based technology company. Each of these IT projects are located in the countries that the teams have been studying. Each team also recommends one of their IT projects by building a business case to support their recommendation.

5. IT STRATEGY CLASSROOM ACTIVITIES

To help readers gain a better understanding of the strategy focused course activities, detailed descriptions for several activities are provided.

Hype Cycles ("Hype Cycle Research," n.d.) are one of Gartner's research methodologies related to the life cycle of a technology or technologies in a specific field. Figure 1 shows a generic Gartner hype cycle showing the expected changes in a technology's visibility as the technology matures. In class, students review Gartner's article explaining the Hype Cycle (Fenn & Raskino, 2013). Students then review recent hype cycle publications and select one for detailed review. While reviewing the selected hype cycle, each student generates one question or observation to be shared during small group discussions.

A similar activity is used for students to learn about the Gartner Magic Quadrant ("Magic Quadrant Research," n.d.) methodology. Figure 2 shows a generic Gartner Magic Quadrant showing how technology providers within a specific area can be viewed in terms of their vision and ability to execute. Again, students review the details of Gartner's methodology (Black & Thomas, 2013) and then select a specific MagicQuadrant for in depth review and discussion.

In addition to learning about tools, students are also introduced to new or emerging technologies and asked to think strategically about the impact of the technology. Guided class discussions are held around many technology topics. For example, for disaster recovery, students read an article about a fire at Notre Dame (Latimer, 2009). Teams of students then brainstorm on the different technology systems at the university and the list is merged from all of the teams. Once a list has been created, teams choose the five technologies that they think should have the highest priority to be restored. Teams are then merged and asked to take both

lists of their top five and merge them into a single list of five. Finally, teams report to the entire class and the entire class joins in a discussion about the priorities.

For cloud computing, students are presented an overview and then work in small groups to identify examples of cloud computing, how cloud computing could help a business achieve strategic goals, and potential concerns from an IT perspective. The entire class then shares and discusses the items identified by the small groups. As part of this discussion, the university's selection and implementation of Google Apps for Education was used to support a specific discussion of interesting points.

For big data, before class, students read an overview on big data (Cuiker, 2010) that is then discussed in class. Students are presented a brief overview of big data and watch and discuss short videos identifying strategic and technology considerations related to big data. Students also complete a hands on activity (adapted from Frydenberg, 2013) using Google's BigQuery tool to get a feel for working with big data. This was followed by small group discussions with the same questions as the cloud computing exercise.

A final in-class activity focuses on gathering and analyzing information about high level strategic trends in the IT industry. For this exercise, students read a summary of a McKinsey survey on business and technology strategy (Khan & Sikes, 2014). The summary includes focused discussions on seven specific areas. Three of these (use of IT to improve business effectiveness, breakdown of planned future IT spend, and anticipated talent needs) are used for small group discussion activities. Each group reviews the assigned section and responds to discussion questions. The small group discussions are then summarized for the entire class.

6. CONCLUSION

While technical skills remain important in the IT and IS fields, technology departments continue to shift the emphasis on IT infrastructure to analytics and innovation to improve business efficiency and effectiveness (Khan & Sikes, 2014). Our students not only need technology skills but they also need to understand how that technology can benefit their organization. Our course, Global and Strategic Issues in IT,

combines intercultural, global, and technology topics that help foster strategic thinking.

Evidence of student achievement of strategy related learning outcomes can be found in reviewing the group presentations throughout the course. As the course progresses, these show steadily increasing to strategic aspects of the use of IT. For most groups, the final presentation offering three foreign expansion ideas for a USA technology company to consider show the expected consideration of intercultural, global, and strategic issues.

7. FUTURE PLANS

For the strategy activities a few improvements are being considered. The activities that introduce the Gartner Hype Cycle and MagicQuadrant tools could be put in context for the higher education environment. Students could use an education related Hype Cycle and assess the university's current efforts on the technologies covered in the Hype Cycle. Similarly, a relevant MagicQuadrant could be identified and assessed in a local context. Both activities could also be extended to include a discussion with the university CIO.

To reinforce the point that IT strategic activities need to work in support of the larger business or organization, students could review the overall university strategic plan and IT specific strategic plan. Students could assess how well the IT plan is tied to higher level goals in the university plan. This would be another opportunity for a discussion with the university CIO or other senior IT staff involved with strategy development.

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Editor's Note:

This paper was selected for inclusion in the journal as the ISECON 2014 Best Paper The acceptance rate is typically 2% for this category of paper based on blind reviews from six or more peers including three or more former best papers authors who did not submit a paper in 2014.

Appendices

Course Overview and Major Student Assignments

Week	Class Activity	Major Student Assignments (listed when they are due)
1	Intro to Course and Global Perspectives	
2	Exploring Culture	
3	Working with Americans	Cultural Assessments
4	Global IT Challenges	Know your Company
5	Tracking Emerging Technologies	
6	Intellectual Property Rights	Know Your Country
7	Security and Privacy	Country Profile #1
8	Technology Management and Disaster Recovery	
9	e-Commerce	Country Profile #2
10	IT Industry and Mobile Computing	
11	IT Industry	Country Profile #3
12	The Cloud and BIG Data	
13	3D-printing and other technologies	
14	Final Presentations	Comfort Zone Assignment Final Project

The course also includes a number of other smaller scale assignments to help students learn about and reflect on global cultural and technology topics.

Know Your Company – Students work in small groups to learn about a specific US technology company. Students work to learn about the company from the perspective of a global IT professional. Groups explore their assigned company's mission, values, global presence, approach to cultural differences, etc. to form a perception of the company. Group findings are shared in a 15 minute in-class presentation.

Know Your Country – Students work in small groups to develop a reference handbook and presentation for a non-US technology company that is looking to expand into the USA.

Country Profiles – Students work in small groups to develop and present a series of country profiles.
1. Provide an overall introduction to the group's primary country (typically a BRICI country), including demographics, government, cultural dimensions, economics, and assessing how well the group's company (from the Know Your Company assignment) would fit in the country from a cultural perspective.
2. Provide an introduction to a secondary country assigned by the instructor and overview of IT infrastructure for the group's primary country.
3. Provide an introduction to a third country (chosen by the group and approved by the instructor) and also profile the IT Industry, mobile computing and the Cloud in the group's primary country.

Comfort Zone Assignment – Students reflect on their comfort zone and identify a culture about which they know little. Each student identifies an activity that will take them out of their comfort zone and writes a 1 – 2 paragraph description for the instructor to review and approve. Students then complete the activity and use techniques learned in class to observe and reflect on the experience and write a 1 – 2 page paper about the activity and what they learned from stepping outside of their comfort zone.

Final Project - For the final project, the student groups are working as consultants for a hypothetical US based technology company. The students identify three potential IT projects in one of the

countries the group has researched for the Country Profiles. On the last day of class, each group turns in a business case document discussing the three potential projects including technical and cultural challenges and making a final recommendation. The groups also make an executive level presentation on the projects and final recommendation.
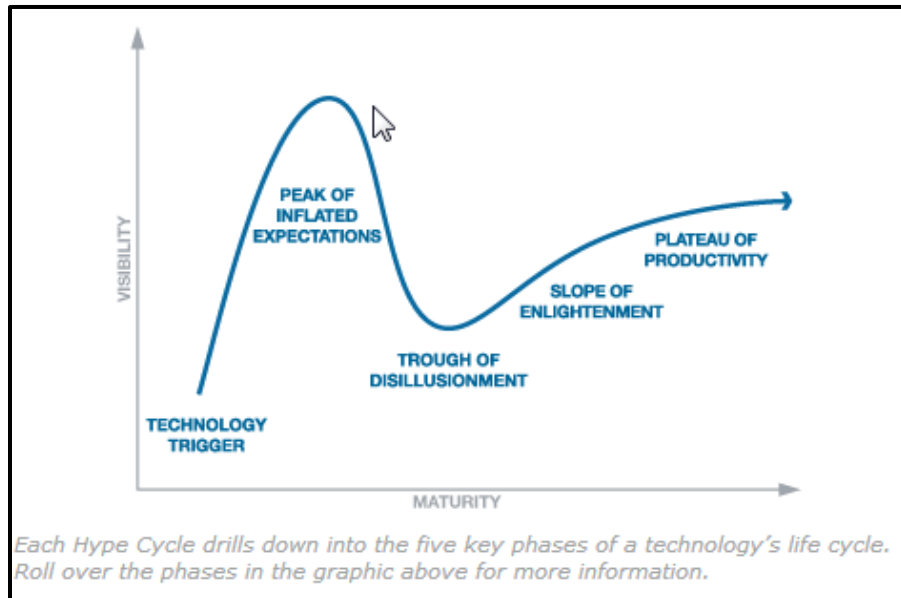

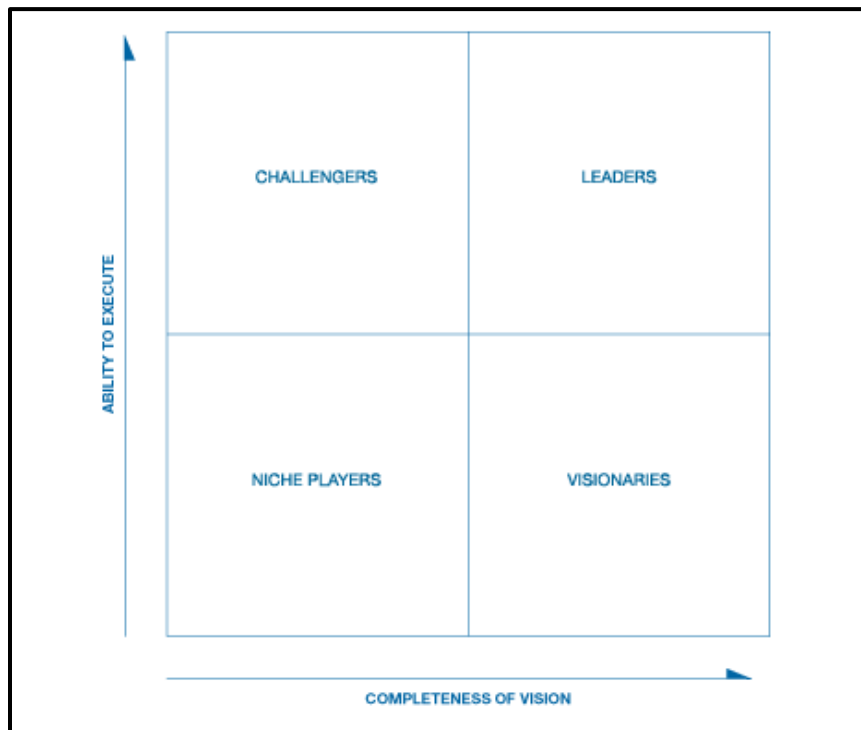Figure 1. The Gartner Hype Cycle methodology for viewing technology's life cycle.

Figure 2. The Gartner Magic Quadrant methodology for understanding technology providers in a specific technology area.