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**Increasing Intrapreneurial Intentions among Business Students:  
Using a Net-Enabled Business Innovation Cycle (NEBIC)  
Theory Team Project**

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*Institutions of higher education are placing greater emphasis on entrepreneurship education. Yet, in reality, few students will actually use their entrepreneurial skills to start a business. Instead, many will go to work for existing organizations as intrapreneurs – those who contribute to entrepreneurship at the firm level. This paper describes how we developed and implemented a team project using the Net-Enabled Business Innovation Cycle (NEBIC) theory as a means to promote intrapreneurial intention in a Technology Entrepreneurship course. We also present pre- and post-project survey results showing that completing the NEBIC project increased students' intention to become intrapreneurs.*

## **INTRODUCTION**

In today's information age, entrepreneurship plays a key role in the technology industry, where technology innovation is responsible for creating a multitude of new products, services, and businesses. Additionally, many entrepreneurs use information technology to create new services and products in a variety of other industries, including online stores, social media, insurance services, and consulting firms. Entrepreneurs who leverage technology to create new products, services, and businesses tend to be more knowledgeable, technology-dependent, and personally innovative (Yli-Renko, Autio, & Sapienza, 2001; Oakey, 2003). Hence, in higher education, researchers have begun to investigate information technology entrepreneurship among business students and recommend that business schools provide technology and business innovation curriculum (Chen 2013).

Entrepreneurship education is believed to be of importance because it “serves to motivate potential entrepreneurs and helps to ensure a critical mass of inflow of ideas and entrepreneurs into the community” (Otto, 1999, p. 54). Due to the vital role entrepreneurship plays in global economic development and job creation, many institutions of higher education have implemented entrepreneurship programs. One important, yet often overlooked aspect of entrepreneurship education is that very few students will go on to use their entrepreneurial skills to start their own businesses. Rather, many will

choose to behave entrepreneurially within existing organizations as intrapreneurs. Intrapreneurs, those who contribute to corporate entrepreneurship at the firm level (Lumpkin & Dess, 1996; Morris & Kuratko, 2002; Davidsson, 2006), are equally important to economic growth and global competitiveness as individual entrepreneurs.

However, to our knowledge, there is a lack of research and practice in the pedagogy literature that focuses on intrapreneurship. To fill this gap, we designed a course project that is aimed to increase students' intrapreneurial intentions. More specifically, we developed and implemented a team project in a technology entrepreneurship course using the Net-Enabled Business Innovation Cycle (NEBIC) theory (Wheeler 2002) as a means to promote intrapreneurial intention, as well as entrepreneurial self-efficacy, which is an important antecedent of intrapreneurial intention (Douglas & Fitzsimmons, 2013).

The remainder of this paper is organized as follows: first, we explain the concepts of entrepreneurial self-efficacy and intrapreneurial intention; second, we provide a description of the NEBIC theory and why applying it in a course project will help students increase their intrapreneurial intention; third, we describe a Technology Entrepreneurship course and how the NEBIC project was used in the course; fourth, we present evidence that the NEBIC project did indeed increase student's entrepreneurial self-efficacy and intrapreneurial intention; and lastly, we discuss implications and recommendations for future practice, as well as contributions of this study.

## **ENTREPRENEURIAL SELF-EFFICACY AND INTRAPRENEURIAL INTENTION**

Entrepreneurial self-efficacy refers to an individual's confidence that they can perform and accomplish various roles and tasks associated with entrepreneurship (Chen et al. 1998). It has been recommended that educators focus on developing entrepreneurial self-efficacy in students as a means to influence entrepreneurial intentions, as prior research has shown that entrepreneurial self-efficacy is one of the most important antecedents to an individual's intention to behave entrepreneurially (Chen, 2013; Chen, Green, & Crick, 1998; Douglas & Fitzsimmons, 2013).

Individuals can act entrepreneurially via two distinct entrepreneurial behaviors: entrepreneurship and intrapreneurship (Douglas & Fitzsimmons, 2013). Intrapreneurship, also known as corporate entrepreneurship, is "entrepreneurship in existing organizations" (Antoncic & Hisrich 2003). Intrapreneurial intention describes an individual's intention to become an intrapreneur, or someone who participates in the formation of new businesses within the boundaries of an existing organization (Martiarena 2013).

Besides the fact that entrepreneurship and intrapreneurship are distinct entrepreneurial behaviors (Douglas & Fitzsimmons, 2013), researchers also found that entrepreneurs and intrapreneurs differ in their attitude towards factors such as income, autonomy, ownership, and risk (Douglas & Fitzsimmons, 2013). These factors are considered as potential antecedents of an individual's intention to become an entrepreneur versus an intrapreneur. This is an important implication for entrepreneurship education because teaching students entrepreneurship under the assumption that they all intend to start their own businesses may "miss the target for many potential intrapreneurs" (Douglas & Fitzsimmons, 2013, p.116). To our knowledge, there is a lack of research and practice that focuses on intrapreneurship in the entrepreneurship pedagogy literature in general, and in information technology entrepreneurship in particular.

One way to foster intrapreneurial intentions is to incorporate assignments or projects into a course that will help students to better understand how to be entrepreneurial within existing organizations. The next section describes the Net-Enabled Business Innovation Cycle (NEBIC) theory, which we believe can be applied in a course project to help students increase their intrapreneurial intention and entrepreneurial self-efficacy – an important antecedent of intrapreneurial intention.

## **THE NEBIC THEORY**

Net-Enabled Business Innovation Cycle (NEBIC) is a theory for “measuring, predicting, and understanding a firm’s ability to create customer value through the business use of digital networks” (Wheeler, 2002, p.125). In today’s business environment, almost all organizations have utilized digital networks (such as the Internet) for their operations and interactions with their stakeholders. These organizations are called net-enabled organizations, or NEOs (Straub & Watson 2001). NEBIC focuses on NEOs’ net-enablement – their capabilities to “continually configure their internal and external resources to employ digital networks to exploit business opportunities” (Wheeler, 2002, p.128).

Net-enablement is considered as a dynamic capability – a firm’s ability to continually reconfigure its competences in a changing business environment to achieve new forms of competitive advantages (Teece et al. 1997; Eisenhardt & Martin 2000). According to Wheeler (2002), net-enablement encompasses four sequenced “simple capabilities” and their routines: 1) choosing Emerging/Enabling technologies (ET), 2) matching Economic Opportunities (EO) with ET, 3) executing Business Innovation (BI) for growth, and 4) assessing Customer Value (CV). These four simple capabilities are sequenced, which means that each antecedent capability provides inputs to its successor capability. For example, a firm with a strong choosing capability is able to provide a steady flow of chosen ET to the matching EO capability (Wheeler, 2002). Equally important, net-enablement stresses the importance of simple capabilities’ routines. A few ad-hoc occurrences of choosing ET, for example, does not imply a high level of this capability. Instead, a steady flow of chosen ET over time is a clear signal of a high level of choosing capability.

Although the NEBIC model was proposed over a decade ago, its implications still apply in today’s ever-changing, technology-driven economy. We believe that applying the NEBIC theory in a course project will help students increase their intrapreneurial intention for the following reasons. First, the NEBIC theory proposes that “a deep and dynamic understanding of new IT developments must precede the formulation of business strategy rather than simply configuring IT to align with strategy” (Wheeler, 2002, p. 126). This means that IT should be viewed as a driving force in formulating business strategy, instead of merely a tool to support business strategy. Taking this view of IT would encourage students to seek opportunities that use IT to create new products and services in various industries, which is a way of behaving entrepreneurially within existing organizations, i.e., behave as intrapreneurs. Second, the NEBIC theory explicitly laid out four sequenced “simple capabilities” and their routines, which conveyed a framework that shows an integrated view of “the net-enabled business innovation process” (Wheeler, 2002, p. 142). In the real world, practitioners have mapped their NEOs’ innovation capabilities with those depicted in the NEBIC framework and have found it very insightful (Wheeler, 2002). By working on a team project that uses NEBIC as a guiding framework, students can apply the NEBIC framework to their chosen organizations and analyze how the four simple capabilities can be achieved. This practice also encourages students to behave entrepreneurially within existing organizations which indicates intrapreneurship. The next section describes our attempt to apply the NEBIC theory in a team project in a Technology Entrepreneurship course.

## **THE TECHNOLOGY ENTREPRENEURSHIP COURSE AND THE NEBIC PROJECT**

### **The Technology Entrepreneurship Course**

Before detailing the NEBIC project, we first describe in general the course content, context, and how the study of technology entrepreneurship can scaffold and support the genesis of intrapreneurial thinking. The Technology Entrepreneurship course is offered to all upper-level undergraduate business majors in a four-year public university. Overall, it endeavors to provide students with a solid theoretical and pragmatic foundation for understanding, identifying, developing, and bring to market new ideas, products, and services. Starting with seminal and thematic reading, we first challenge student’s ontological and epistemological perceptions of technology. Next, we introduce students to supply chains, manufacturing, and distribution channels.

With a growing appreciation and shared understanding of technology and the business of doing business, we introduce students to a myriad of technologies, both enabling and emerging, and how said technologies progressed from serendipity, deep thought, or a combination of both, to the marketplace. While market pressures are not covered in the course per se, the wealth of ideas and products derived and dismissed as a result of competition receive equal attention. Students also receive extensive training in product development, manufacturing, and distribution strategies and concepts, as well as product life cycle considerations.

### **The NEBIC Project**

As a major component of the course, students are organized into teams of four to six people, and each team is required to work on a NEBIC project, which accounts for 40 percent of their final grade. The complete assignment instruction is provided in Appendix A.

The assignment is provided to students during week 2 of a fifteen-week semester. Throughout the semester, student teams are required to meet with the instructor twice, during week 8 and week 14 or 15, respectively, to discuss the progress of their projects and to seek instructor feedback. A brief project timeline is provided in Table 1 below.

**TABLE 1  
NEBIC PROJECT TIMELINE**

Week 2	Assign NEBIC paper for students to read; distribute NEBIC project instructions.
Week 8	NEBIC meeting #1: As a guide on the side, the instructor meets with student teams to gauge their thought process in choosing and subsequently matching technologies to a firm within a given industry of choice. This step in the educational process is critical in that students are forced into a meta-cognitive stance relative to what has been learned to date and what they are proposing. Often, major modifications and/or new ideas are set in motion. While disruptive by intent, it is believed that this top-down pressure (i.e., the professor questioning students' ideas) approximates real-world industry demands to provide optimal returns on investment in competitive markets.
Weeks 14 & 15	NEBIC meeting #2: As a final walk through, the instructor meets with student teams to discuss development, manufacturing, and distribution strategies.
By the end of Week 15	NEBIC Project due (a weaving together of Deliverables 1 through 4 as described in Table 2 below)

For the project, students are first asked to read the NEBIC paper (Wheeler, 2002). Then, working in teams, students choose a firm within a specific industry and, following the NEBIC framework, detail the steps of creating new or enhanced customer value by way of: (1) choosing an enabling or emerging technology, (2) matching that technology with economic opportunities, (3) executing a strategy for realizing the business innovation, and (4) providing mechanisms for identifying, managing, assimilating, and leveraging both external (i.e., market-based or third party) and internal (i.e., organizational-based) information cues while monitoring and controlling the entire process. Upon completion of the project, each team writes up their findings in a paper that has four deliverables (see a brief description of each deliverable in Table 2 below). Teams are encouraged to share their deliverables with the instructor throughout the semester so that the instructor can provide feedback along the way; but this is not mandatory.

**TABLE 2**  
**NEBIC PROJECT DELIVERABLES**

Deliverable I	<ul style="list-style-type: none"> <li>• Identify a firm and analyze the firm’s current state (e.g., existing supply chain, value chain, IT infrastructure, SWOT analysis)</li> <li>• Identify a set of potential enabling or emerging technologies (ET) for the chosen firm</li> </ul>
Deliverable II	<ul style="list-style-type: none"> <li>• Analyze the set of ETs identified in Deliverable I and choose a single ET that meets the firm’s objectives the best</li> </ul>
Deliverable III	<ul style="list-style-type: none"> <li>• Identify potential organizational changes the identified ET might bring to the organization and the role of supporting technologies</li> </ul>
Deliverable IV	<ul style="list-style-type: none"> <li>• Analyze what customer value means to the firm and how it is measured</li> <li>• Analyze whether implementing the identified ET will bring a sustainable competitive advantage to the firm</li> </ul>

**IMPACT OF NEBIC PROJECT ON ENTREPRENEURIAL SELF-EFFICACY, INTRAPRENEURIAL INTENTION, AND ENTREPRENEURIAL INTENTION**

As previously discussed, entrepreneurial self-efficacy describes an individual’s belief that they can successfully perform entrepreneurial roles and tasks (Chen et al. 1998). Prior research has shown a positive relationship between entrepreneurial self-efficacy and both entrepreneurial and intrapreneurial intentions (Douglas & Fitzsimmons, 2013). Unlike entrepreneurial intention, which describes an individual’s intention to become self-employed, intrapreneurial intention describes an individual’s intention to become an intrapreneur, or someone who participates in the formation of new businesses within the boundaries of an existing organization (Martiarena 2013). In this study, we assess whether the NEBIC project influenced student’s entrepreneurial self-efficacy and ultimately their intrapreneurial intention. In addition, because entrepreneurial intention and intrapreneurial intention are two closely related but distinct concepts, we measure both constructs to evaluate whether the NEBIC project had different impact on them.

To assess student’s entrepreneurial self-efficacy and their entrepreneurial and intrapreneurial intentions, we administered two surveys, in week 3 and week 15, respectively, to 28 students who took the Technology Entrepreneurship course and completed the NEBIC project. Table 3 summarizes student demographics.

**TABLE 3**  
**SUMMARY OF STUDENT DEMOGRAPHIC CHARACTERISTICS**

Gender			Major		
Male	21	75%	Marketing	2	7.1%
Female	7	25%	Management	3	10.7%
Age			Management Information Systems	5	17.9%
Mean value	22 years		Entrepreneurship	14*	50%
Class			Accounting	1	3.6%
Junior	14	50%	Other	3	10.7%
Senior	11	39.3%			
Other	3	10.7%			
Total N= 28 for each demographic characteristic					

\* 6 out of 14 entrepreneurship major students have a double-major in Marketing (2 students), Management (3 students), or Human Resources (1 student). We did not double-count these students in the table.

In the first survey (Time 1), we measured an individual's entrepreneurial and intrapreneurial intentions (for the purpose of creating a base-line to compare to perceptions following the course's content). Similarly, in the second survey (Time 2), we again measured an individual's entrepreneurial and intrapreneurial intentions (in order to gauge the relative changes, affinities and/or self-beliefs regarding one's intention to become either an entrepreneur and/or an intrapreneur). The items we used to measure entrepreneurial and intrapreneurial intentions were adopted from Douglas and Fitzsimmons (2013). In addition to measuring entrepreneurial and intrapreneurial intentions, we also measured entrepreneurial self-efficacy, which has been shown to be one of the most important antecedents to the formation of an individual's intention to behave entrepreneurially, whether it be as a self-employed entrepreneur or as an employed intrapreneur (Chen, 2013; Chen et al., 1998; Douglas & Fitzsimmons, 2013). The items used to measure entrepreneurial self-efficacy were adopted from Zhao, Seibert, and Hills (2005).

Table 4 presents a paired-sample t-Test comparing post-NEBIC (Time 2) means to pre-NEBIC (Time 1) means for entrepreneurial self-efficacy, entrepreneurial intentions, and intrapreneurial intentions. The results reveal a significant increase in entrepreneurial self-efficacy and students' intentions to be an intrapreneur after they complete the NEBIC project while no significant difference was found in intentions to be an entrepreneur. This showed that after completing the NEBIC project, students' intentions to become intrapreneurs increased as well as their beliefs in general regarding their entrepreneurial abilities.

**TABLE 4**  
**IMPACT OF NEBIC PROJECT ON STUDENTS' INTRAPRENEURIAL INTENTION – T-TEST VALUE**

	<b>Time 1</b>	<b>Time 2</b>	<b>Paired Sample t-Test n=28, df=27</b>
<b>Entrepreneurial Self-Efficacy</b>	4.05 (1.48)	4.33 (1.67)	t(27) = 2.295, sign=.030 *
<b>Intrapreneurial Intentions</b>	4.23 (1.08)	4.84 (1.55)	t(27) = 2.295, sign=.004 *
<b>Entrepreneurial Intentions</b>	5.08 (.967)	5.14 (1.15)	t(27) = .453, sign=.654

#### **IMPLICATIONS AND RECOMMENDATIONS FOR FUTURE PRACTICE**

Our study provides several implications and recommendations for future practice. First, our results indicate that incorporating the NEBIC project into the Technology Entrepreneurship course increased student's entrepreneurial self-efficacy and ultimately their intrapreneurial intentions. It did not, however, increase their entrepreneurial intentions. As prior research has suggested, and as our results indicate, intrapreneurship is distinctly different from entrepreneurship. That is, intrapreneurship appears to be a set of distinctive capabilities relative to entrepreneurship in general. As such, preparing students to think and act as entrepreneurs versus intrapreneurs may require distinctively different approaches. Our results support this notion – using a purposive pedagogical activity focused on providing students with the tools and project-based experience to becoming an effective intrapreneur is distinctly different from that of an entrepreneur; but as an approach to promote behaving entrepreneurially, it also meaningfully and positively affects one's overall entrepreneurial self-efficacy.

Second, while teams were encouraged to seek instructor feedback on all deliverables before submitting them at the end of the semester, some teams chose not to. Those teams that did share their deliverables with the instructor throughout the progression of the project had markedly better cohesion among team members, higher levels of involvement and participation in class discussions and activities,

and higher peer evaluations (as evidenced by unanimously even distributions). Hence, our recommendation would be that in addition to having two face-to-face meetings with each team, the instructor should also require teams to submit deliverables 1, 2 and 3 at various points throughout the project for feedback. This should lead to greater levels of across-the-board student involvement in the project as well as increase the richness of in-class discussions and activities by way of sheer numbers of students being meaningfully engaged.

Third, the general outline of the NEBIC project described in the paper and the project instructions provided in the appendix can serve as a guide for educators interested in adopting the project in their courses. Although best suited for a technology entrepreneurship course like the one described in this paper, we believe that the NEBIC project can also be adopted in other courses such as graduate level introductory course to information systems, information technology strategy course and information technology based business transformation course.

## CONCLUSION

Educators have recognized the importance of teaching students entrepreneurship due to the vital role entrepreneurship plays in global economic development and job creation (Otto, 1999). However, not all students who take entrepreneurship courses will start their own business. Instead, many will become intrapreneurs, who contribute to corporate entrepreneurship at the firm level (Lumpkin & Dess, 1996; Morris & Kuratko, 2002; Davidsson, 2006). To our knowledge, there is a lack of research and practice in the pedagogy literature that focuses on intrapreneurship. To fill this gap, we developed and implemented a team project in a technology entrepreneurship course using the Net-Enabled Business Innovation Cycle (NEBIC) theory (Wheeler, 2002) as a means to promote student intrapreneurial intention. Pre- and post-project survey results showed that after completing the NEBIC project, students' intention to become intrapreneurs increased.

The results we obtained from incorporating the NEBIC project into the Technology Entrepreneurship course make several contributions. First, it provides support for prior research that has found a distinct difference between entrepreneurship and intrapreneurship and thus emphasizes the difference between teaching entrepreneurship and intrapreneurship to students. Since very few students intend on using their entrepreneurial skills to start their own business, it is important to make students aware that engaging in intrapreneurship in existing organizations is an equally valuable alternative to starting a new business. Second, we provide evidence suggesting that the NEBIC team project increases intrapreneurial intentions as well as promotes stronger beliefs in ones overall entrepreneurial abilities. Third, our paper presents in detail a team project that instructors can adopt in their entrepreneurship courses. Although we have only incorporated the project at the undergraduate level, it can also be used at the graduate level.

## REFERENCES

- Antoncic, B. and Hisrich, R.D. (2003). Clarifying the Intrapreneurship Concept. *Journal of Small Business Enterprise Development*, 10(1), 7-24.
- Chen, L. (2013). IT Entrepreneurial Intention Among College Students: An Empirical Study. *Journal of Information Systems Education*, 24(3), 233-243.
- Chen C.C., Greene, P.G., Crick, A. (1998). Does Self-Efficacy Distinguish Entrepreneurs from Managers? *Journal of Business Venturing*, 13(4), 295-316.
- Davidsson, P. (2006). Method Challenges and Opportunities in the Psychological Study of Entrepreneurship. In J.R. Baum, M. Frese, & R.A. Baron (Eds.), *The Psychology of Entrepreneurship*. Mahway, NJ: Erlbaum.
- Douglas, E.J. and Fitzsimmons, J.R. (2013). Intrapreneurial Intentions Versus Entrepreneurial Intentions: Distinct Constructs with Different Antecedents. *Small Business Economics*, 41, 115-132.
- Eisenhardt, K.M. and Martin, J.A. (2000). Dynamic Capabilities: What Are They? *Strategic Management Journal*, 21(10/11), 1105-1121.

- Lumpkin, G.T. and Dess, G.G. (1996). Clarifying the Entrepreneurial Orientation Construct and Linking it to Performance. *Academy of Management Review*, 2(1), 135-172.
- Martiarena, A. (2013). What's So Entrepreneurial About Intrapreneurs? *Small Business Economics*, 40, 27-39.
- Morris, M.H. and Kuratko, D.E. (2002). *Corporate Entrepreneurship*. Mason, OH: Thomson South-western.
- Oakey, R.P. (2003). Technical Entrepreneurship in High Technology Small Firms: Som Observations on the Implications for Management. *Technovation*, 23, 679-688.
- Otto, J.W. (1999). Entrepreneurship Skills for Scientists and Engineers: Recent European Initiatives, *Institute for Prospective Technological Studies of the Joint Research Centre*, Retrieved July 10, 2015, from <http://ipts.jrc.ec.europa.eu/home/report/english/articles/Vol37/EHC5E376.htm>
- Straub, D.W. and Watson, R.T. (2001). Transformational Issues in Researching IS and Net-Enabled Organizations. *Information Systems Research*, 12(4), 337-345.
- Teece, D.J., Pisano, G. and Shuen A. (1997). Dynamic Capabilities and Strategic Management. *Strategic Management Journal*, 18(7), 509-533.
- Wheeler, B.C. (2002). NEBIC: A Dynamic Capabilities Theory for Assessing Net-Enablement. *Information Systems Research*, 13(2), 125-146.
- Yli-Renko, H., Autio, E., and Sapienza, H. (2001). Social Capital, Knowledge Acquisition, and Knowledge Exploitation in Young Technology-Based Firms. *Strategic Management Journal*, 22(6/7), 587-613.
- Zhao, H., Seibert, S.E., and Hills, G.E. (2005). The Mediating Role of Self-Efficacy in the Development of Entrepreneurial Intentions. *Journal of Applied Psychology*, 90(6), 1265-1272.

## APPENDIX A. NEBIC PROJECT INSTRUCTIONS

### Introduction

In this course, you are exposed to many salient issues facing managers in today's information-driven, and more recently, net-enabled economy. Throughout your readings, you have been exposed to many different theoretical perspectives, e.g., theories of the firm, of technology usage and adoption, media richness, etc., however, two main themes continually surface. First, there is a complex relationship that exists between individuals/groups/societies and technology, and, at best, predicting and controlling these emergent, socio-technical phenomena are daunting. Second, as managers of business-level strategies, you will be expected to make use of, and be forward thinking in your use of, enabling/existing and emerging technologies to the extent that these technologies, along with current organizational capital, business processes, and business relationships, yield unique and meaningful competitive advantages for your firm, i.e., your entire value chain. These advantages may serve as the genesis for reinventing your organization, i.e., its structure, processes, products, and/or services, or may serve as the fuel for further differentiation - maximizing current organizational strengths and/or mitigating organizational weaknesses.

Much has been recently written in the popular press and academic journals about the role of technology in the marketplace, however, few have conveyed a framework for guiding today's organizational leaders. One such paper, that really imbues the aforementioned themes, as well as providing a guiding framework, is NEBIC (Wheeler, 2002). NEBIC, unlike traditional thinking, calls for firms to first scan the environment for enabling and/or emerging technologies that can be matched with organizational opportunities that may, or may not, be immediately apparent to the firm. That is, emerging and/or enabling technologies may serve as the origins for enhancing a firm's products and/or services; improving its industry position; and, may even serve in redefining an entire industry or set of industries (e.g., retail commerce and the impact of the Internet and emerging technology in the 1990s).

## **Objective**

For this project, your team will choose a firm within a specific industry and, following the NEBIC framework, detail the steps of creating new or enhanced customer value by way of: (1) choosing an enabling or emerging technology, (2) matching that technology with economic opportunities, (3) executing a strategy for realizing the business innovation, and (4) providing mechanisms for identifying, managing, assimilating, and leveraging both external (i.e., market-based or third party) and internal (i.e., organizational-based) information cues while monitoring and controlling the entire process.

## **Deliverables**

All deliverables are to be type written in APA format, i.e., a cover page (name of project, team members, and deliverable name), table of contents, body, reference section (if needed), appendices (if needed), and a running header. Deliverables may be submitted in equal intervals (e.g., every four weeks) or as an entire submission on or before the end of the semester.

### **Deliverable I (suggested – not all may apply)**

- Identify a firm
- Perform an industry analysis (a historical perspective of the industry)
- Identify the firms existing supply chain processes and partnerships
- Identify and summarize the firms existing value chain
- Identify the firms existing IT infrastructure for supporting their value chain (inputs to outputs)
- Identify salient political or legal structures (current and future) that may impact the firm and industry
- Perform a SWOT analysis of the chosen firm relative to its industry
- Lastly, identify a set of potential enabling or emerging technologies for the chosen firm (note: this is tough, and, as Dr. Wheeler suggests, a critical success point for leveraging technology in hopes of extracting customer value)

### **Deliverable II (suggested – not all may apply)**

- Review, in some detail, the set of enabling or emerging technologies (ET) identified in deliverable I
- Explicitly align the identified ETs with the opportunities that emerged from the SWOT analysis in deliverable I
- Perform an economic feasibility analysis on each of the identified ET-Opportunity sets (the numeric analysis of both benefits and costs can or may be estimated from the prior year's balance sheet, industry standards, etc.)
- Identify any intangible benefits and/or costs (those not easily quantifiable \$\$\$) that may emerge (e.g., more efficient logistics, employee goodwill, social outreach, etc.)
- Assuming there are only resources available to execute a single ET, describe the criteria used in your selection process and how the chosen ET maximizes your organizational objectives (i.e., creating value for the firm and its customers/constituents)

### **Deliverable III (suggested – not all may apply)**

- Identify the organizational processes or units that may be impacted by this new endeavor/technology implementation
- Identify the impacts of the technology on the firm's current product/service mix (e.g., cannibalization, differentiation, extension, etc.)

- Identify the structural changes that may be necessary, and how best to achieve them, in the process of executing your chosen enabling or emerging technology (i.e., will it change the organization's leadership structure, how key individuals access information, the overall IT infrastructure, its relationship with partnerships, its suppliers, its inbound/outbound/reverse logistics, its points-of-purchase, its relationship with customers, etc.)
- Identify the role of supporting technologies, i.e., those required to support this new endeavor at the various functional (marketing, accounting, etc.) and organizational levels (TPS, MIS, DSS, and ESS), and any necessary changes to the IT infrastructure.

**Deliverable IV (suggested – not all may apply)**

- What type of information systems are in place, or may need to be instantiated, for facilitating the flow of knowledge and learning within the organization (e.g., acquiring, sense making, and distributing)
- Identify the social aspect of knowledge transfer. That is, discuss the social enablers and inhibitors of knowledge transfer that may emerge, for instance, you may want to concentrate on the following key issues: (1) the organization must first decide what information is meaningful and which is noise, (2) the organization must then try to get those with knowledge and information to share/encode what they know, and, (3) the organization must also identify the barriers to information searching/extracting, i.e., do individuals have the necessary absorptive capacity, do knowledge seekers know where to look and/or who to ask, and is the knowledge management system easy to use, etc.
- Identify what customer value means to your firm (financially, strategically, etc.)
- How will you measure customer value (e.g., sales, repeat sales/customer tenure, reverse logistics/returns, new customers, etc.)
- To what extent do you expect your supply and/or value chain to be enhanced
- Is this a sustainable competitive advantage (what's next for your net-enabled firm).

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