TECHNOLOGY AND INNOVATION PROGRAM

A ten-week intensive program providing comprehensive review of the disciplines required to manage the ongoing innovation and rapidly changing technology in today's business environment and strategies to assure sound decision-making for business in an interconnected world.

With the dramatic acceleration of technological change and innovation in the U.S. (and the world) over the past twenty years, it has been difficult for businesses to keep pace. The goal of this program is to provide an understanding of the key disciplines involved in the practical management of technology and innovation for business.

At the conclusion of this program, the successful student should have an appreciation of the information technology industry, in general, and the pertinent aspects of managing technology and innovation and strategic decision-making to benefit one's business, in particular. The student should be able to apply the knowledge gained in the program to "real world" business situations, recognizing that information technology (in all its forms, i.e., data, voice, image, text, graphics) is a critical and viable business tool that can be managed effectively in an interconnected world and an era of innovation and constantly changing and evolving technology. The program is ideally suited for IT professionals, technology managers, project managers and others who are responsible for the planning or implementation of new technologies. The curriculum is designed to be accessible and useful to managers and decision-makers.

Program content will consist of instructor-led lecture/discussions, reading materials, homework assignments (in the form of online quizzes), and a final case study project.

YOU WILL LEARN ABOUT:

- Technology as an External Business Force
  - Information technology as a critical business tool
  - Competition drives innovation
  - Innovation improves competitive position
- Impact of Regulation and Competition on Technological Advancement
  - Brief historical perspective
  - Millennial shift
  - Convergence and its impact on organizations
  - Current and emerging trends
- Decision-Making in the New Environment
  - Dynamic Managerial Capabilities Theory
  - Quality of managerial decisions
  - Strategic change
  - Managerial impact on strategic change
  - Organizational performance
- Technology in the Corporate Environment
  - "Technology Radar" approach
  - Technology acceptance model
  - Various IT Systems and Workplace applications
  - System Design and implementation
  - System management issues
  - Network design and management issues
- Security and Risk
  - Landscape (information space is neither average nor normal)
- The systematic under-estimation of risk
- Disaster prevention/recovery issues
- Cyber crime prevention
- Record systems and management support
- IT/Telecom Technology from a Global Business Perspective
  - Global community communications
  - Global systems/applications/complications
  - Global network management issues/variances
  - Managing globally with information technology
- Ongoing Management Issues
  - Managing the environment day-to-day
  - Vendor/consultant management
  - Technology migration plans
  - Budgeting
  - Staffing (internal and external)
  - Continual process improvement
- Summary and Review
  - What does it all mean to business
  - The Internet of Things
  - What does the future hold?
  - Scanning the horizon
- Case Study presentations
TECHNOLOGY AND INNOVATION PROGRAM

Over the past fifteen years we have gone from thinking the data world as we know it was coming to an end (Y2K anyone?) to a world where data has grown disproportionately with our ability to safely and sanely manage it. There is an entirely new lexicon for managers of IT and many of us are a little overwhelmed by the breadth and proliferation of the terminology. Such terms as Big Data, The Internet of Things, Data Visualization, Data Analytics (in all its forms – Predictive, Descriptive and Real-Time), Structured Data, Unstructured Data, Hadoop, Business Intelligence, and Machine Learning are tossed around like IT frisbees. Just keeping up with the terminology is enough to give one a migraine. Couple that with the ever-expanding demands placed on management to provide near-universal access, mobility, and unlimited data capacity in a globally-connected world and the challenge becomes daunting at best and career-ending if not managed correctly. With these challenges in mind, DePaul’s Institute for Professional Development has designed a program to address many of these issues, with a practical approach to understand the issues confronting managers today, deconstruct the terminology, and provide sound techniques for managing in an interconnected world.

The Technology and Innovation Program is designed to be a comprehensive study of the disciplines involved in the practical management of technology and innovation for business.

CURRICULUM

This program is lecture/discussion oriented, with the emphasis on discussion. The course is intended and designed to involve the student's participation in each class. There will be extensive use of handouts and audio/visual aids. Weekly synopsis sheets will be provided as a student study guide. There may also be guest lecturers as time and schedules permits. Periodic quizzes and a case study will reinforce the lectures and learning materials.

TECHNOLOGY AS AN EXTERNAL BUSINESS FORCE

There are a number of factors, both external and internal, that can-and will impact your organization over time. Your understanding of these factors will enable you to provide the most optimal decisions with regard to supporting your organization’s long-term technological needs. There are at least six external factors (many of which are uncontrollable) that can influence your organization. Recognizing which of these will have immediate and/or long-lasting impacts on your organization will enable you to foresee possible occurrences and allow you to formulate effective strategies to adapt your organization to them and overturn the threats to future opportunities.

Among these external factors are:

- Competition
- Government Policies and Regulation
- Natural forces
- Social and Cultural Forces
- Demographic Factors
- Technological Changes and Innovation

We will address each of these, as they relate to sound decision-making and the management of technology.

The internal environment of the organization also will have an impact on your managerial effectiveness and decision-making ability. Whereas the external factors are relatively uncontrollable, the internal factors can be more malleable. How these factors impact your abilities as an effective manager and decision-maker, and how you can exert some level of control, will be discussed at some length.

IMPACT OF REGULATION AND COMPETITION ON TECHNOLOGICAL ADVANCEMENT

There has been a dramatic acceleration of technological change and advancement in the U.S. over the past twenty years (NOTE: global impact will be discussed later in this course) Much of this change was driven by two factors: (1) change in demand (previously discussed in Week 1), and (2) regulatory changes that created a springboard for the expansion of
competition and innovation. The driving force behind much of the technological change and innovation was the concept of “convergence.” Network convergence in the United States was facilitated by the legal and regulatory framework put into place by Congress and the FCC (Federal Communications Commission) and driven by new generations of information and telecommunications technology. Unlike other countries (e.g., Japan, South Korea, China) or regions (e.g., the European Union), the United States never adopted a formal convergence policy (for various reasons). Instead, technological change has been driving convergence - from previously distinct telecommunications and media markets. The United States network infrastructure has evolved from circuit-based networks, in which individual applications were tightly woven into the network architecture, to an IP-based network, in which multiple applications ride on top of a single physical network layer. How this fundamental change in network architecture and inexorable march to convergence impacts organizational communications will be discussed. We will also discuss current and emerging trends in this area, as it relates to sound decision-making and the management of technology.

DECISION-MAKING IN THE NEW ENVIRONMENT

Dynamic Managerial Capability Theory speaks to the capability of an organization to adapt adequately to changes that can have an impact on its functioning. The concept is defined as “the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments.” The term is often used in the plural form, dynamic capabilities, emphasizing that the ability to react adequately and timely to external changes requires a combination of multiple capabilities. Dynamic Capabilities Theory attempts to deal with two key questions: (1) How can senior managers of successful companies change their existing mental models and paradigms to adapt to radical discontinuous change? And (2) How can companies maintain threshold capability standards and hence ensure competitive survival?

This will be the basis of our discussion regarding strategic decision-making and management of technology and innovation. This discussion will emphasize (1) the recognition of changes in the environment in timely fashion; (2) the development of a strategic approach to address the changes in the environment; (3) the structure and quality of the decision-making process; and (4) organizational performance – that is, the recognition, acceptance and timing of changes to the organization (i.e., how long does it take for your organization to adapt to change). All of these are factors which impact your ability as a manager to affect positive control over technology and innovation.

TECHNOLOGY IN THE CORPORATE ENVIRONMENT

Once there is recognition of the factors that can impact your selection and implementation of the proper technologies to meet your organization’s needs, and you have an understanding of the organizational factors that can impact your decision-making abilities, the next step is to look at ways to analyze and select technologies. This should be done with a minimum of bias toward particular technologies or the manufacturers or vendors of those technologies. This week, we will focus on various methodologies that have been successfully utilized to make logical decisions with regard to systems and networks. Two such methodologies, among others, that we will review are the “Technology Radar Approach” (first developed by Deutsche Telekom) and the Technology Acceptance Model. The first deals with making sound choices regarding technology and network services. The second deals with how users come to accept and use a new
technology. An effective manager recognizes that these are complementary elements in the section

Once the decision criteria have been thoroughly discussed, the discussion can shift to the types of technologies, applications, and networks that an organization might effectively deploy to meet its needs. We will discuss the issue of managing “Big Data” and its implications in the new corporate environment. Organizations must find practical ways to deal with big data to stay competitive — to learn new ways to capture and analyze growing amounts of information about customers, products, and services. Data is becoming increasingly complex in structured and unstructured ways. New sources of data from machines, social business sites, and website interaction (e.g., click-stream data) create new challenges. Meeting these changing business requirements demands that the right information be available at the right time. Our discussion will revolve around currently available technologies, workplace applications, and internal and external network platforms (including cloud technologies). We will discuss the development of a functional design and selection process, and review steps to accomplish successful and errorless implementations. We will also discuss network design and management issues at a high level.

SECURITY AND RISK

This week, we will focus on an area of concern for every organization today - protecting information confidentiality. Sensitive data loss prevention is one of the key areas of focus in light of industry and government regulations and the potential for large-scale negative publicity (we will look at some recent examples). With a solid understanding of your organization, it is important to develop a plan for both IT security and IT risk management that can be presented (and accepted) at the executive levels of your organization. That means security objectives must be defined for the organization as a whole and fall within the a number of critical categories: integrity, availability, confidentiality, use control and accountability. These objectives provide the criteria used to determine whether the architecture is appropriate for the given task. The Gartner Group established methodology for assessing and developing comprehensive IT security architectures and deployment strategies, including identity and access management (IAM) architectures. We will discuss this methodology (and others) and discuss what factors are most critical to your organization. We will also discuss the proper means of benchmarking security strategies and developing cost models.

TECHNOLOGY FROM A GLOBAL BUSINESS PERSPECTIVE

We will focus on an area of concern for many organizations today – the need for global communications access as part of their overall communications requirements. Review of the key technological components of global communications networks and issues associated with designing, implementing and maintaining such networks. Overview of key players in the global communications marketplace. Discussion of variances in the makeup of such networks, including differences in regulatory policies (or the lack thereof), and barriers to competition in some markets, which can markedly affect the selection process. Finally, differences involved in managing a global communications network versus a domestic network.

ONGOING MANAGEMENT ISSUES

We will focus on an area that is often ignored by managers – that is the day-to-day operational management of the technological environment. We will review the areas of particular concern to assure a “continual improvement process,” i.e., the regular and consistent improvement of the technological environment through intelligent management of your assets and resources. Management of vendors and consultants, to
assure the advice and counsel you receive from them provide optimal benefit for your organization. Discussion of the need for “future planning,” i.e., being proactive vs. reactive. Discussion of the mundane issues (but highly necessary) of budgeting and staffing and the skills to position you with upper level management.

**SUMMARY AND REVIEW**

Comprehensive review of all program material as well as discussion of how it applies to your organization. Overview of emerging technologies and issues for which you should prepare, e.g., the “Internet of Things”. Discussion of how these emerging technologies could impact your organization and your management of technology and innovation.

**CASE STUDY**

On the last night of the program, students will present their Report of Findings based on the case study assigned earlier in the program. Students will explain to their peers how they arrived at their conclusions. There will be an open Q&A session after each presentation.

**GENERAL INFORMATION**

**ADMISSION**

Professional work experience in the administration, support or management of information technology services is recommended. Acceptance into the program will be determined by the admissions committee on the basis of an applicant's overall qualifications, including work history and educational background.

A substantial commitment of time is required for this intensive course of study. Students must attend a three-hour lecture (or view online video of the recorded lecture) per week, in addition to completing text readings, written homework assignments (in the form of online quizzes), and a case study assignment. Students will be expected to contribute to class discussions.

The purpose of the online quizzes which will be given at specific intervals through the course is to reinforce concepts learned. The intent of the case study is to assure that the student has a firm grasp of the concepts presented throughout the duration of the course.

**FACILITIES**

To promote the learning process, the Institute maintains special-purpose laboratories as well as dedicated classrooms equipped with state-of-the-art audio/visual equipment.

In addition, the college’s unique Course OnLine (COL) technology allows students to replay classes over the Internet. COL captures and replays five components of the classroom experience—audio, video, PC screen, whiteboard, and document camera input—and incorporates them into one interface to provide an innovative rebroadcast system.

**SCHEDULE**

The Institute offers one section of the program each quarter. Classes meet one day per week.

**FACULTY**

The program is taught by James Heatherly, MBA (and guest lecturers, as time permits). Mr. Heatherly has been an adjunct lecturer at DePaul for many years, and has experience teaching undergraduate and graduate coursework, as well as IPD programs since the Institute was founded. He has taught graduate courses in Telecommunications Management, Telecom Law and Telecom Economics. He is also currently teaching IS 596 - Management of Technology & Innovation in DePaul’s College of Computing and Digital Media. Mr. Heatherly will be available throughout the program both in person and through e-mail.
The college, through its School of Cinematic Arts, School of Computing, and School of Design, offers a variety of programs at the undergraduate and graduate levels. Over 2,500 students are enrolled in the college’s bachelor’s programs and over 2,000 students are enrolled in the master's and Ph.D. programs making the college’s graduate program one of the largest in the country. The college offers more than 200 courses each quarter, many in the evening, in several locations: the Loop Campus, the Lincoln Park Campus, the O’Hare Campus and the Naperville Campus. Many of the degree programs are also available exclusively online.

Current offerings at the undergraduate level include:

- B.A. Animation
- B.S. Computer Development
- B.A. Computing
- B.A. Digital Cinema
- B.S. Digital Cinema
- B.F.A. Graphic Design
- B.S. Information Assurance and Security Engineering
- B.S. Information Systems
- B.S. Information Technology
- B.S. Interactive and Social Media
- B.S. Math and Computer Science
- B.S. Network Engineering and Security

Current offerings at the graduate level include:

**Master’s Programs**
- M.A. Animation
- M.S. Applied Technology
- M.S. Business Information Technology
- M.S. Cinema Production
- M.S. Computational Finance
- M.S. Computer Game Development
- M.S. Computer Science
- M.S. Computer, Information and Network Security
- M.A. Digital Communication and Media Arts
- M.S. E-Commerce Technology
- M.S. Health Informatics
- M.S. Human-Computer Interaction
- M.S. IT Project Management
- M.S. Network Engineering and Security
- M.S. Predictive Analytics
- M.S. Software Engineering
- J.D./M.S. Computer Science Technology
- M.F.A. Animation
- M.F.A. Cinema
- M.F.A. Documentary
- M.F.A. Screenwriting

**Master’s of Fine Arts Programs**
- M.F.A. Animation
- M.F.A. Cinema
- M.F.A. Documentary
- M.F.A. Screenwriting

The Institute for Professional Development was formed by the college in 1984 to assist both individuals and businesses in keeping pace with the rapid development of computer technologies. The Institute currently offers a variety of intensive certificate programs in these areas:

- Advanced SQL
- Big Data and NoSQL
- Big Data Using Hadoop
- Cloud Computing Technologies
- Data Science for Business
- Java™ Developer
- Java™ Web Development
- .NET Web Developer
- Ruby on Rails™
- SQL Server® Business Intelligence
- SQL Server® Database Administration
- Web Development with JavaScript and HTML5
- Web Development with Python®

**APPLICATION PROCEDURE:**

Complete the enclosed application and return it with a non-refundable $40.00 application fee (check or money order made payable to DEPAUL UNIVERSITY) to:

DePaul University
Technology and Innovation Program
Institute for Professional Development
243 S. Wabash Avenue, Room 301
Chicago, IL 60604-2300