Forecasting Industry and Technology Futures

ENTP 6387.501 SPRING 2012

Class Meeting Fridays 1900-2145, SOM 2.803 **Office Hours:** TBD	**Yoram Solomon, Ph.D., MBA, LLB** No Office on Campus **Email**: yoram.solomon@utdallas.edu **Phone**: (469) 688-5120

COURSE OBJECTIVES:

This course will focus on the challenges of analyzing social, economic and technology trends and forecasting the future performance of specific industries and technologies over time. The course will cover tools and techniques for the analysis of the historical evolution of key industry, demographic, social and technology trends (such as Moore's law for semiconductor performance), information resources, and methodologies for extrapolating and forecasting the future state of industries and technologies. Industry convergence, standards and network externalities will also be addressed. The product/market implications of industry trends and technology futures will be explored through the use of case studies and projects.

The course will discuss technological trends, non-technological trends, megatrends and consumption trends, the relationship between technology planning and forecasting, different forecasting methods (monitoring, expert opinion, quantitative extrapolation, and simulations), data sources, technology diffusion and adoption, the experience curve, the importance of the technology ecosystem in predicting technology adoption, technology standards, and how to use forecasting to make strategic decisions and create market disruptions.

The course project will be implementing a business scenario planning, to allow making certain technology decisions.

LEARNING OBJECTIVES

Upon successful completion of this course, students will:

- Understand the importance of technology and industry forecasting to business planning, across different types of technologies and industries, and how accurate forecasting allows management to make the right business decisions and gain competitive position, as well as identify opportunities for market disruption.
- Demonstrate the ability to use the four main forecasting tools (monitoring, expert opinion, quantitative extrapolation, and simulations) to predict technological and non technological trends and futures.
- Understand the impact of the ecosystem, system standards, and other "political" factors on the course that technologies take, as well as learn how to guide those factors in favorable directions in support of business preferences and decision.
- Demonstrate the ability to use all the elements of scenario planning in a practical course project, forecasting the future of a certain technology and industry.

REQUIRED COURSE MATERIALS:

- **Solomon, Y. 2007.** Bowling with a Crystal Ball. BookSurge. ISBN: 1-4196-5287-7
- **Ralston, B., & Wilson, I. (2006).** Scenario Planning Handbook: Developing Strategies in Uncertain Times. Thomson, Mason, Ohio. ISBN: 0-324-31285-7
- **Course Pack**: Cases and selected readings (available at UTD Bookstore and Off-Campus Books).
- **Electronic Readings**: Download eJournals (Harvard Business School and other sources) as required. The eJournals are available for download at no charge on the UTD McDermott Library website http://www.utdallas.edu/library/collections/journals.htm (see ASSIGNMENTS below).
- **Web Articles**: Download certain articles, videos, and other media sources from the Internet as required.
- **Fraser, N. M. 1986.** Political and social forecasting using conflict analysis—The US presidential race. *European Journal of Political Economy*, *2*(2), 203-222 (provided by instructor with author permission)

SELF INTRODUCTION

Each student should post a Self-Introduction in the Discussion area of WebCT prior to January 10th. Guidelines are provided on the WebCT Discussion page. This information will be used to set up my gradebook and assist in the formation of groups for the course.

LECTURE NOTES

The MS Powerpoint slides used in lectures and case discussions and other course-related materials will be posted on WebCT (http://webct.utdallas.edu) under course ID ENTP 6387. You should be able to access WebCT with your UTD Unix ID and password. Call computer services at (972) 883-2911 if you need assistance.

COURSE REQUIREMENTS & GRADING:

The list of assignments and cases is attached. Supplemental materials may be provided or posted electronically. Advance preparation and enthusiastic participation in class discussions is an important part of the learning experience in this course and will be evaluated.

The course has been designed to allow flexible management of your time. There will be no quizzes or exams. Your grade will be based on individual written assignments and your contributions to class discussions. These assignments, their due dates and page limits, and their relative weights in determining your final grade are summarized in the table below:

Assignment	Due Date	Type	Length (pages)	Weight
1. Assignment 1: Non tech. trends: 9/11	January 27	Individual	2-3	10%
2. Assignment 2: Forecasting difficulties	February 10	Individual	2-3	10%
3. Assignment 3: Electric Aviation	March 2	Individual	3-4	10%
4. Case: Apple Inc., 2008	March 30	Individual	4-5	15%
5. Scenario Planning—Final Project	May 4	Individual	10-20	25%
6. Individual presentation	Individual dates	Individual	4-8	10%
7. Class Participation		Individual	N/A	20%
		Overall Course Grade		**100%**

Individual Presentation. Each student will be assigned to present an assignment in front of class. The presentation will be based on the answers to the assignment, and the student will lead the class discussion with a 20 minute PowerPoint presentation to discuss the assignment. The individual presentation does not substitute the submission of the paper associated with the assignment, but will be graded separately (see above). The presentation will be graded based on the ability to deliver a compelling argument to the assignment, and in engaging the audience.

Written Assignments

- ***Evaluation.*** Ninety percent (90%) of your grade will be based on individual written assignments. Written assignments will be evaluated on multiple factors, including (a) fully addressing the requirements; (b) critical evaluation and effective insights into the case situation; (c) demonstrated ability to apply the course concepts and frameworks in your analysis; (d) logical conclusions and effective recommendations; and (e) effective communications. Particular care should be taken to fully address the requirements for each paper as detailed in the assignment. A written evaluation and critique will be provided on all graded papers.
- ***Format.*** Each written assignment should comply with the page length guidelines specified for the assignment. The use of charts and exhibits is encouraged, to the extent that they help you make your points. Cover pages, charts or exhibits, and lists of references will not be included in the page count. Charts and exhibits should be numbered and appropriately referenced in the body of the document. A list of references should be attached as required. The manuscript should use 11-12 point type, double-spaced, with 1" margins all around. Appropriate titles and section headings should be used. Binders and report covers are neither necessary nor desired. **Number the pages, put the course number and your name(s) at the top of each page and staple in the upper left corner**.

- ***Outline Form Response***. Some assignments specify an outline form response. I will expect a statement of the question followed by a bulleted or numbered list of the key items in your response (see example on WebCT).
- ***Essay Form Response***. Some assignments specify an essay form response. I will expect a well organized paper that addresses the case questions and uses section headings, bulleted lists, charts and exhibits as appropriate to clearly communicate your message.
- ***Electronic Submissions.*** If you submit a paper by email, the file name should identify the course, assignment number and your name or group ID. For example, "MKT6320_2_JSmith.doc" would identify John Smith's written assignment #2.
- ***Due Dates and Late Paper Policy***: Written assignments are due at the beginning of class on the date assigned. Group assignments will not be accepted late. Individual papers turned in within one week after the due date will be graded, but 30 points will be deducted. Late papers received more than one week after the due date will receive a zero. Exceptions may be made if extreme circumstances warrant.

Case Analysis Guidelines

Some of the written assignments and class discussions may require the analysis of case situations. Discussion questions for each case are provided below to help you to focus your analysis. You are encouraged to work together in your study groups to discuss the cases, including the individual written assignment cases, with the understanding that individual assignments (including tables and figures) are to be prepared and written by yourself. The following general approach to case analysis is recommended:

- Read the case quickly. Identify the key issues and decisions/actions required (the case preparation questions will help you to focus on the key issues). Prioritize the issues in terms of urgency and importance.
- Decide what kind of recommendations should be made (and to whom)
- Choose appropriate analytical tools/frameworks from those introduced in the course
- Analyze the situation thoroughly using the frameworks and theoretical frameworks provided in the readings
- Draw logical conclusions based on your analysis
- Make specific recommendations for action in response to the questions posed in the case or the preparation questions (what should be done, who should do it, when and in what sequence).

In general, there are no "right" or "wrong" answers for a specific case – different approaches and insights are possible, depending on your individual perspective and approach. Regardless, I will expect you to draw logical conclusions and (if appropriate) make recommendations that: (a) address the identified strategic issues; (b) follow logically from your analysis and conclusions; and (c) make sense (are feasible) in the context of the case situation.

Class Participation

Ten percent (10%) of your grade will be based on the quality of your preparation and active participation in class discussions and exercises. From time to time, it may be necessary to miss a class due to illness or personal business. Please let me know in advance. Keep in mind that written assignments must be emailed by the due date, regardless. If attendance or participation becomes an issue, your grade will be impacted.

UNIVERSITY POLICIES

***Off-campus Instruction and Course Activities*.** Off-campus, out-of-state, and foreign instruction and activities are subject to state law and University policies and procedures regarding travel and risk-related activities. Information regarding these rules and regulations may be found at the website address http://www.utdallas.edu/BusinessAffairs /Travel_Risk_Activities.htm. Additional information is available from the office of the school dean. Below is a description of any travel and/or risk-related activity associated with this course.

***Student Conduct & Discipline*.** The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. General information on student conduct and discipline is contained in the UTD publication, *A to Z Guide*, which is provided to all registered students each academic year.

The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the *Rules and Regulations, Board of Regents, The University of Texas System, Part 1, Chapter VI, Section 3*, and in Title V, Rules on Student Services and Activities of the university's *Handbook of Operating Procedures*. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SU 1.602, 972/883-6391).

A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.

Academic Integrity. The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.

Scholastic dishonesty includes, but is not limited to, statements, acts or omissions related to applications for enrollment or the award of a degree, and/or the submission as one's own work or material that is not one's own. As a general rule, scholastic dishonesty involves one of the following acts: cheating, plagiarism, collusion and/or falsifying academic records. Students suspected of academic dishonesty are subject to disciplinary proceedings.

Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course will use the resources of turnitin.com, which searches the web for possible plagiarism and is over 90% effective.

Email Use. The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence be sent only to a student's U.T. Dallas email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of confidence in the identity of all individual corresponding and the security of the transmitted information. UTD furnishes each student with a free email account that is to be used in all communication with university personnel. The Department of Information Resources at U.T. Dallas provides a method for students to have their U.T. Dallas mail forwarded to other accounts.

Withdrawal from Class. The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, I cannot drop or withdraw any student. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled.

Student Grievance Procedures. Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the university's *Handbook of Operating Procedures*.

In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originates (hereafter called "the respondent"). Individual faculty members retain primary responsibility for assigning grades and evaluations. If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy of the respondent's School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Dean's decision, the student may make a written appeal to the Dean of Graduate or Undergraduate Education, and the deal will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is final. The results of the academic appeals process will be distributed to all involved parties.

Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.

Incomplete Grade Policy. As per university policy, incomplete grades will be granted only for work unavoidably missed at the semester's end and only if 70% of the course work has been completed. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of **F**.

Disability Services. The goal of Disability Services is to provide students with disabilities educational opportunities equal to those of their non-disabled peers. Disability Services is located in room 1.610 in the Student Union. Office hours are Monday and Thursday, 8:30 a.m. to 6:30 p.m.; Tuesday and Wednesday, 8:30 a.m. to 7:30 p.m.; and Friday, 8:30 a.m. to 5:30 p.m.

The contact information for the Office of Disability Services is:

The University of Texas at Dallas, SU 22
PO Box 830688
Richardson, Texas 75083-0688
(972) 883-2098 (voice or TTY)

Essentially, the law requires that colleges and universities make those reasonable adjustments necessary to eliminate discrimination on the basis of disability. For example, it may be necessary to remove classroom prohibitions against tape recorders or animals (in the case of dog guides) for students who are blind. Occasionally an assignment requirement may be substituted (for example, a research paper versus an oral presentation for a student who is hearing impaired). Classes enrolled students with mobility impairments may have to be rescheduled in accessible facilities. The college or university may need to provide special services such as registration, note-taking, or mobility assistance.

It is the student's responsibility to notify his or her professors of the need for such an accommodation. Disability Services provides students with letters to present to faculty members to verify that the student has a disability and needs accommodations. Individuals requiring special accommodation should contact the professor after class or during office hours.

Religious Holy Days. The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated.

The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment.

If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.

DISCUSSION QUESTIONS FOR ASSIGNMENT AND CASE ANALYSIS

The following discussion questions are provided to help you complete a structured analysis focusing on the key issues in each assignment or case. It is important, in written assignments, to address each of these points.

Written Assignment 1, Session 2 (1/27): Non-Technological Trends—9/11

How did the events of September 11, 2001 affect the technologies used in the travel industry and in the homeland security industry? Could those events been predicted? What additional effects could terrorism have on those two industries in the future?

Written Assignment 2, Session 4 (2/10): Forecasting Difficulties

Search the Internet and find a forecast done at least 5 years ago (2006 or earlier), that forecasted specific developments in 2010-2011, which failed significantly.

1. Describe the forecast made.
2. What was incorrect?
3. Why was it incorrect?
4. What decision could have been made differently based on the correct/incorrect forecast?

Written Assignment 3, Session 8 (3/2): Quantitative trend extrapolation—Electric Aviation

The Radio Controlled (RC) airplane hobby has significantly moved from gas powered engines to electric power. This trend could translate into general and commercial aviation.

1. What are the technologies we need to forecast in order to know when will it be feasible?
2. Why is it not feasible today?
3. What are the technology parameters we need to monitor?
4. Bonus question: when can electric aviation be viable? [Answering this question with strong substantiation will multiply your grade by 1.25).

Written Assignment 4, Session 10 (3/30): Case—Apple Inc., 2008 (HBS 9-708-480)

1. What technological trends affected the success of the iPod? When could they have predicted in 2001 or earlier?
2. What needed to happen from the introduction of the iPod in October 2001 until its significant market success in 2004?
3. Apple's major revenue sources in the first 3 quarters of 2008 were Desktops ($4.24b), Portables ($6.42b), and iPod ($7.49b). iPhone represented "only" $1.04b in those 3 quarters. What do you think is the next product to generate a billion dollar business for Apple Inc.? What needs to happen for this product to be a success?

Class Project, Due 5/2: The Flying Car

You were just hired as a strategy consultant for a company that decides to bring a flying car to the masses. Assume that the technology is feasible. You are asked by the company to create a strategy for the company, based on a scenario planning process. Unfortunately, you do not benefit from participation of executives or employees in the company, and you have to perform it yourself.

1. Decision focus: Define the decision focus for the project. What is the scope of the decision? What is the timeline? What is the decision that needs to be made? This should be a single paragraph with 1-2 questions defined in bullets. [1/2 page]
2. Driving forces: Identify between 4 and 8 driving forces that will potentially affect the decisions that will be made. Single paragraph for each driving force [1 to 1 ½ pages]

3. Critical inevitabilities: What are the 1-4 most impactful "inevitabilities" that will affect the decision to be made? Single paragraph for each critical inevitability [1 to 1 ½ pages]
4. Critical uncertainties: What are the 2-3 most impactful "uncertainties" that will affect the decision to be made? Single paragraph for each critical uncertainty [1 to 1 ½ pages]
5. Scenarios, overview: What scenarios result from the critical uncertainties? Theoretically, if you have 2 critical uncertainties with 2 extreme positions for each, you will have 4 possible scenarios. However, sometimes there might be more than 2 extreme positions for a critical uncertainty, and sometimes there are combinations of critical uncertainty extremes that do not make sense, although the critical uncertainties do not overlap. Define 3-5 possible scenarios, explain why there are no more/less possible scenarios, and provide a chart that shows those scenarios. Include names for the scenarios, and explain the logic of those names [1 to 2 pages, including one chart]
6. Scenario stories: Tell the story of each scenario, as you envision it reasonably unfolding in the timeline defined by the scope of the decision. [1 to 1 ½ pages per story, 4 to 6 pages total]
7. Strategy recommendations: What possible sets (no more than 3) strategic moves would you recommend to the company moving forward? What is the level of fit between the different sets of strategic moves and different scenarios are? Can you rank the different sets of strategies (if you have more than one)? [1 page per strategy, total of 1 to 4 pages, if including chart(s)]
8. Signposts and monitoring: What are the signposts you will recommend to monitor? Why are they important? Are there any events that, if they occur, would make you recommend a change in strategy? How should you monitor those signposts? List 1 to 3 such signposts, and describe each by 1 to 3 paragraphs [1 to 3 pages]

This paper is the capstone assignment of this class, and as such its grade will have a higher weight than any other assignment. Treat it as such. It is recommended that you work on this paper in parts, starting in session 5, as we go through the different parts of the scenario planning theory and process. The total length of the paper will vary between 10 ½ to 20 pages. Make sure you adhere to the length requirements of each section. You will be challenged to stay on topic, focused, detailed enough, but not include long write ups. The grade for this final paper is split equally between the different section (12.5% of this paper's overall weight for each section).

COURSE OUTLINE

Date	Preparation	Assignments
Session 01 1/20	**Technological Change** 1. OUTLOOK 2009. (cover story). (2008). *Futurist, 42*(6), 1-9. (eJournal) 2. Engineers' Forecasts For Technology. (2003). *Futurist, 37*(4), 8-9. (eJournal) 3. Solomon (2007), Introduction (pp. xvii-xxvi), Chapter 10 (pp. 131-135) (TEXTBOOK) 4. Fuld, L. (2003). Be Prepared. *Harvard Business Review, 81*(11), 20-21. (eJournal) 5. Christensen, C. M., Baumann, H., Ruggles, R., & Sadtler, T. M. (2006). Disruptive Innovation for Social Change. *Harvard Business Review, 84*(12), 94-101. (eJournal)	**Come to class prepared to discuss the readings**
MLK Day		
Session 02 1/27	**Non Technological Trends** 6. Solomon (2007), Chapter 6 (pp. 67-73) (TEXTBOOK) 7. Wooten, J. O. (2000). Health Care in 2025: A Patient's Encounter. *Futurist, 34*(4), 18-22. (eJournal) 8. Fisher, R. W. (1997). The future of energy. *Futurist, 31*(5), 43-46. (eJournal) 9. Frey, T. J. (2008). Disrupting the Automobile's FUTURE. *Futurist, 42*(5), 38-42. (eJournal) 10. Sager, B. (2000). Scenarios on the future of biotechnology. *Technological Forecasting and Social Change, 68*, 109-129. (eJournal)	**Written Assignment #1 (9/11):** Individual
Session 03 2/3	**Megatrends** 11. Solomon (2007), Chapter 7 (pp. 77-102) (TEXTBOOK) 12. Cetron, M. J., & Davies, O. (2008). Trends Shaping Tomorrow's World: Forecasts and Implications for Business, Government, and Consumers (Part One). *Futurist, 42*(2), 35-52. (eJournal) 13. Cetron, M. J., & Davies, O. (2008). Trends Shaping Tomorrow's World (Part Two). *Futurist, 42*(3), 35-50. (eJournal)	**Come to class prepared to discuss the readings**
Session 04 2/10	**Technology Planning and Forecasting Difficulties** 14. Rosenberg, N. (1995). Why technology forecasts often fail. *Futurist, 29*(4), 16-21. (eJournal) 15. Courtney, H., Kirkland, J., & Viguerie, P. (1997). Strategy under uncertainty. *Harvard Business Review, 75*(6), 67-79. (eJournal) 16. Drucker, P. F. (1959). Long-range planning. *Management Science, 5*(3), 238-249. (eJournal) 17. Ralston & Wilson (2006), Chapter 1 (pp. 3-9), Chapter 2 (pp. 11-20) (TEXTBOOK)	**Written Assignment #2 (failed forecast):** Individual
Session 05 2/17	**Forecasting Methods and Moore's Law** 18. Moore, G. E. (1965). Cramming more components onto integrated circuits. *Electronics, 38*(8). (http://download.intel.com/museum/Moores_Law/Articles-Press_Releases/Gordon_Moore_1965_Article.pdf) 19. Mann, C. C. (2000). The End of Moore's Law? *Technology Review, 103*(3), 42-48. (eJournal) 20. Solomon (2007), Chapter 1 (pp. 3-16) (TEXTBOOK) 21. Five views of the future: A strategic analysis framework. (2005). Austin, Texas: Technology Futures Inc. (http://www.tfi.com/pubs/w/pdf/5views_wp.pdf) 22. Saffo, P. (2007). Six Rules for Effective Forecasting. (cover story). *Harvard Business Review, 85*(7/8), 122-131. (eJournal) 23. Georgoff, D. M., & Murdick, R. G. (1986). Manager's guide to forecasting. *Harvard Business Review, 64*(1), 110-120. (eJournal) 24. Ralston & Wilson (2006), Chapter 7 (pp. 51-56), Chapter 8 (pp. 57-63) (TEXTBOOK)	**Come to class prepared to discuss the readings**

Session 06 2/24	**Data Sources** 25. Solomon (2007), Chapter 5 (pp. 49-66) (TEXTBOOK) 26. Vanston, J. H. (2005). Testing the tea leaves--Formal methods for evaluating the validity of forecasts. Austin, Texas: Technology Futures Inc. (http://www.tfi.com/pubs/w/pdf/ti_testing.pdf) 27. Ralston & Wilson (2006), Part 3, Chapter 11-12 (pp. 73-85), Chapter 14 (pp. 97-100), Appendix D (pp. 245-256), Chapter 2 (pp. 11-20) (TEXTBOOK)	
Session 07 3/2	**Quantitative Trend Extrapolation** 28. Nutt, A. B.; Lenz Jr., R. C.; Lanford, H. W.; Cleary, M. J.(1976) Data Sources for **Trend Extrapolation** in **Technological** Forecasting. Long Range Planning, Feb76, Vol. 9 Issue 1, p72-76. (eJournal) 29. Doran, Charles F. (1999). **Why Forecasts Fail**: The Limits and Potential of Forecasting in International Relations and Economics.. International Studies Review, Summer99, Vol. 1 Issue 2, p11, 31p (eJournal) 30. Lanford, H.W., & Imundo, L.V. (1974). Approaches to Technological Forecasting as a Planning Tool. Long Range Planning, August 1974, 49-58. (eJournal) 31. Cisco Visual Networking Index: Forecast and Methodology, 2009-2014. http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-481360.pdf 32. Hyperconnectivity and the Approaching Zettabyte Era. http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/VNI_Hyperconnectivity_WP.pdf	**Written Assignment #3 (Electric Aviation):** Individual
Session 08 3/9	**Expert Opinion and the Delphi Method** 33. The Delphi Method, Techniques and Applications. (2002) Eds. Linstone, H.A., & Turoff, M. http://is.njit.edu/pubs/delphibook/delphibook.pdf Introduction (pp. 3-12) 34. Story, V., Hurdley, L., Smith, G., & Saker, J. (2001). Methodological and practical implications of the Delphi technique in marketing decision-making: A re-assessment. *Marketing Review, 1*(4), 487-504. (eJournal) 35. Solomon (2007), Chapters 2 & 3 (pp. 17-36) (TEXTBOOK) 36. Fenn, J., & Linden, A. (2005). *Gartner's hype cycle special report for 2005*. Stamford, CT: Gartner, Inc. (http://www.gartner.com/resources/130100/130115/gartners_hype_c.pdf) 37. Vanston, L. K. (2008). Practical tips for forecasting new technology adoption. *Telektronikk 3/4.2008*. (http://www.tfi.com/pubs/w/pdf/telektronikk_tips.pdf)	**Come to class prepared to discuss the readings**
SPRING BREAK		
Session 09 3/23	**Technology Diffusion, Adoption, and Experience Curve** 38. Henderson, B. D. (1974). The experience curve - Reviewed, Perspectives: The Boston Consulting Group, Inc. (5 parts, from http://www.bcg.com/impact_expertise/publications/files/Experience_Curve_I_The_Concept_1973.pdf, http://www.bcg.com/impact_expertise/publications/files/Experience_Curve_II_History_1973.pdf, http://www.bcg.com/impact_expertise/publications/files/Experience_Curve__lll_Why_Does_It_Work_1973.pdf, http://www.bcg.com/impact_expertise/publications/files/Experience_Curve_IV_Growth_Share_Matrix_1973.pdf, http://www.bcg.com/impact_expertise/publications/files/Experience_Curve_V_Price_Stability_1973.pdf) 39. Bass, F. M. (2004). A New Product Growth for Model Consumer Durables. *Management Science, 50*, 1825-1832. (eJournal) 40. Ralston & Wilson (2006), Chapter 13 (pp. 87-95), Chapters 15-16 (pp. 103-117) (TEXTBOOK)	**Come to class prepared to discuss the readings**

Session 10 3/30	**Technology Ecosystem** 41. Solomon (2007), Chapter 14 (pp. 187-208) (TEXTBOOK) 42. Block, R. (2005). Blu-ray vs HD DVD: State of the Division: engadget. (http://www.engadget.com/2005/09/19/blu-ray-vs-hd-dvd-state-of-the-s-union-s-division/) 43. Bangeman, E. (2007). HD DVD and Blu-ray deadlock to continue into 2009... at least. (http://arstechnica.com/hardware/news/2007/09/hd-dvd-and-blu-ray-deadlock-to-continue-into-2009-at-least.ars) 44. Block, R. (2008). HD DVD group cancels CES press conference in wake of Warner announcement: daaamn: engadgetHD. (http://www.engadgethd.com/2008/01/04/hd-dvd-group-cancels-ces-press-conference-in-wake-of-warner-anno/) 45. Solomon, Y. (2001). PC makers must prepare to bundle ADSL modems, EE Times: CMP. (http://www.eetimes.com/op/showArticle.jhtml;jsessionid=LN4Q52F1IPASKQSNDLPSKHSCJUNN2JVN?articleID=18305658&printable=true&printable=true) 46. **CASE:** *Apple Inc., 2008* (HBS 9-708-480)	**Written Assignment #4 (Apple):** Individual
Session 11 4/6	**Technology Standards** 47. David, P. A. (1985). Clio and the economics of QWERTY. *American Economic Review, 75*(2), 332-337. (eJournal) 48. Solomon (2007), Chapter 15 (pp. 209-223) (TEXTBOOK) 49. Shapiro, C., & Varian, H. R. (1999). The Art of Standards Wars. *California Management Review, 41*(2), 8-32. (eJournal) 50. Oshri, I., & Weeber, C. (2006). Cooperation and competition standards-setting activities in the digitization era: The case of wireless information devices. *Technology Analysis & Strategic Management, 18*(2), 265-283. (eJournal) 51. Ralston & Wilson (2006), Chapter 17 (pp. 119-124) (TEXTBOOK)	**Come to class prepared to discuss the readings**
Session 12 4/13	**Simulations and Scenario Planning** 52. Schoemaker, P. J. H. (1991). When and How to Use Scenario Planning: A Heuristic Approach with Illustration. *Journal of Forecasting, 10*(6), 549-564. (eJournal) 53. Fraser, N. M. (1986). Political and social forecasting using conflict analysis -- The US presidential race. *European Journal of Political Economy, 2*(2), 203-222. (distributed by instructor with permission). 54. Cornelius, P., Van de Putte, A., & Romani, M. (2005). Three Decades of Scenario Planning in Shell. *California Management Review, 48*(1), 92-109. (eJournal) 55. Wack, P. (1985). Scenarios: uncharted waters ahead. *Harvard Business Review, 63*(5), 73-89. (eJournal) 56. Ralston & Wilson (2006), Chapter 18 (pp. 125-137), Chapter 19 (pp. 141-148) (TEXTBOOK)	**Written Assignment #5:** Individual
Session 13 4/20	**Using Forecasts to Disrupt Markets** 57. Rossman, P. (2006). E-Power to the People. *Futurist, 40*(5), 6-7. (eJournal) 58. Westwick, R. (2007) Mobile **WiMAX** versus **LTE**: A comparison of next generation mobile broadband technologies. *Journal of Telecommunications Management, 1*(1), 79-85. (eJournal) 59. Smith, B. (2008). The Marriage of WiMAX and LTE. *Wireless Week, 14*(12), 20-21. (eJournal) 60. Kapustka, P. (2008). Why LTE Vs. WiMax Isn't Your Typical Standards Battle, Information Week. (http://www.informationweek.com/shared/printableArticle.jhtml;jsessionid=AIIBUJ1HDPQHUQSNDLRSKHSCJUNN2JVN?articleID=212501054)	**Come to class prepared to discuss the readings**

Session 14 4/27	**Simulations II: Business War Games** 61. Gilad, B. (2008). *Business War Games*. Academy of Competitive Intelligence. (http://www.bengilad.com/corporate_strategy_simulations.php) 62. Correia, C. C. (2006). War Games: Gaining Advantage on the Business Battleground, Directions Magazine. (http://www.directionsmag.com/article.php?article_id=2252&trv=1) 63. Fuld & Company: View a war game side bar. Click on the different game videos (**The Battle for Healthcare Information, The Battle for the Wireless Internet, The Battle for the Virtual Community, The Battle for Digital Entertainment Supremacy,** and **The Battle for Clicks**) (http://www.fuld.com/Services/HMLWG0904.html#viewit) 64. *Millenium Challenge 02*. (2002). (http://web.archive.org/web/20070928005405/http://www.jfcom.mil/about/experiments/mc02.htm) 65. Galloway, J. (2006). Rumsfeld's war games. *Military.com*. (http://www.military.com/opinion/0,15202,95496,00.html) 66. Crawley, V. (2002). Millenium challenge chief defends exercise's integrity, *Army Times*. (http://www.armytimes.com/legacy/new/0-ARMYPAPER-1129351.php) 67. Vanston, L. K. (2007). A new telecommunications world. Austin, Texas: Technology Futures, Inc. (http://www.tfi.com/pubs/r/r02007_telecomworld.pdf)	**Come to class prepared to discuss the readings**
Session 15 5/4	**Simulations III: Conducting the Scenario Planning Session** Ralston & Wilson (2006), Chapter 20 (pp. 149-165), Chapter 21 (pp. 167-169) (TEXTBOOK) In this session the class will conduct a scenario planning session in groups.	**Conduct Scenario Planning in Class**