

Entrepreneurs and the Information Age

Student Handout

Background

The high-tech industry continues to grow and to change at an astounding rate. New companies form daily. Their stock prices are fueled by high-tech promise not even dreamed about a few years ago. It seems the "old rules" of business no longer apply.

How has the computer revolution affected people's lives? What are the ethical responsibilities of successful entrepreneurs? Are there technologies that should not be pursued, regardless of the ability to do so?

Join Nathan Myhrvold, Phillip F. Anschutz, James Crowe, Mario Morino and Michael Saylor in the high-tech revolution as they discuss with students, their groundbreaking roles, where the high-tech industry is going and the opportunities that lie ahead.

People, Places and Events

Who comes to your mind when the topic of entrepreneurs is discussed? Conduct a brainstorming session with your fellow classmates to generate a list of at least five entrepreneurs, from industries other than high tech, who made a noticeable difference. Next identify a significant contribution or key event in their lives. And then determine the geographic location or place associated with that event.

	PERSON	PLACE	EVENT
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2	-----	-----	-----
3	-----	-----	-----
4	-----	-----	-----
5	-----	-----	-----

PROGRAM GUESTS

Phillip F. Anschutz

is Chairman of the Board of Qwest Communications International Inc., and owner of The Anschutz Corporation, a holding company with interests in natural resources, railroads, real estate, and communications. Beginning in the early 1960s, Anschutz parlayed a few family drilling rigs into one of America's largest oil empires, then diversified into railroads, commercial real estate development, and ownership in various public companies. Starting in 1973, his Oxford-AnsCo Development Corp. became one of the biggest real estate operations in downtown Denver, investing in skyscrapers like the Fairmont Hotel, the Anaconda Tower, the Great West Plaza twin towers and the \$250 million, 56-story Republic Plaza. Anschutz made good use of his railroad connections when he founded Qwest Communications, which offers phone service and is developing the next-generation Internet. The company laid its fiber-optic network along railroad right-of-ways Anschutz had acquired from Southern Pacific among others. His investments have made him a billionaire, and enabled him to participate in numerous philanthropic activities, including his own charitable institution, the Anschutz Foundation. He is also the owner of the L.A. Kings hockey team.



Pre-Program Explorations

Terms to Define

- Entrepreneur
- Intelligence
- Achievement
- Success
- Failure
- Data mining
- Privacy
- Internet
- Integrated Public Offering (IPO)

Topics to Research

- What technical obstacles must be overcome before the full potential of information technologies can be realized?
- What are the societal issues that need to be addressed before the full potential of information technologies can be realized?
- What characteristics should an entrepreneur possess in order to be successful?
- What effects did other technological innovations, such as electricity, telephone, radio, etc., have on society?

Issues to Consider

- Is failure always a negative outcome?
- Who should determine which types of information should be made freely available?
- How will security and privacy conflict with the need for the gathering, analysis and dissemination of information?
- What role should governments play in the collection, analysis and dissemination of information?
- What role should private industry play in the collection, analysis and dissemination of information?
- What are the potentials for abuse of information technology?
- The featured guests are described as achievers. Does achievement differ from success, and in what ways? How would you define achievement?

Post-Program Explorations

ACHIEVEMENT EXPLORATIONS

- Achievement Television has defined six components of achievement: vision, preparation, integrity, courage, passion, and perseverance. Choose one of the featured guests and give examples of ways in which he embodies these traits.
- Choose one of the individuals listed in the first technology exploration, and analyze his/her contributions in light of our definition for achievement. Can he/she

analyze his/her contributions, in light of our definition for achievement. Can he/she be described as an achiever?

TECHNOLOGY EXPLORATIONS

- Examine the contribution that each person has made to the communications and computer industries.
 - Johann Gutenberg
 - Alexander Graham Bell
 - Guglielmo Marconi
 - Thomas Edison
 - Blaise Pascal
 - Gottfried von Leibniz
 - Charles Babbage
 - Alan Turing
 - Claude Shannon
 - John von Neuman
 - J. Presper Eckert
 - John Mauchley
 - Thomas Watson
 - Gordon Moore
 - Robert Noyce
 - Steve Jobs
 - Bill Gates
 - Paul Allen
- How have developments in communications and computers been accelerated by the "standardization" of technologies? Could this same standardization actually serve to impede progress?
- Each society has many responsibilities to its members, yet money is a finite resource. How can we ensure that all members of society have access to the benefits of information technology?
- Explore the history of women in the fields of communications and computers. What contributions have been made, what obstacles exist (or existed), and how can their role be expanded?

HISTORY/SOCIAL STUDIES/ETHICS EXPLORATIONS

- Trace the development of communication over the course of history, from village story tellers through the modern era.
- Physician and humanitarian Albert Schweitzer said that technology must not exceed humanity. Explain this statement, and discuss the implications, for society, if technology were to exceed humanity. Has this already happened?

ENGLISH/LANGUAGE ARTS EXPLORATIONS

- Read George Orwell's *1984*. Evaluate potential directions for development of the

information superhighway with regards to role of Big Brother in 1984.

CURRENT EVENT EXPLORATION (Web lesson)

Information for Sale

Every time you use a credit card, go to the doctor, purchase an airline ticket, get a traffic ticket or go online, information about you is collected, analyzed and saved. This information may be obtained by a wide array of different organizations, including, but not limited to, credit companies, retailers, insurance companies and potential employers. They can use this information to help them decide whether or not to offer you a loan, approve medical, life or automobile insurance coverage, offer you a job or suggest that you have a potentially life-saving medical exam.

Question for Exploration

How can we balance the needs of individuals for privacy and yet provide them with the information necessary to fulfill the promise of the "Age of Intelligence?"

PROCEDURE

Collect background information. In order to formulate an answer to the "Question for Exploration," you'll need to conduct some research to gather pertinent information and data about the topics. Some suggested areas for research are listed below, but you may find that you need to answer additional questions to make an informed response. A list of Web sites is provided, at the end of the procedure section, to help jump-start your search. If you need to gather information from additional resources, be sure to evaluate their validity. Government and university sites generally have more reliable information than personal or commercial sites. Keep a record of the information you've collected, as well as the source of that material. Include both the Web site name and URL address.

- Is there potential for abuse of these technologies?
- How would such technologies be regulated? Who would benefit from these technologies?
- List the types of information that you would like to have available as an employer preparing to hire new employees. List all of the personal information that would you be willing to provide to a perspective employer. Compare these lists and discuss why information on one list might not be listed on the other.

Synthesize the information that you've collected to develop a response to the "Question for Exploration." The format for that response, (written, oral, Web-based, etc.) will be decided upon by your teacher.

Suggested Web sites:

[Self-Regulation and Privacy Online: A Report to Congress](#)

[Georgetown Internet Privacy Policy Survey: Report to the Federal Trade Commission](#)

[Privacy](#)

[For the Record – Protecting Electronic Health Information](#)

[Personal Privacy and Access to Medical Databases](#)

[ACLU – Defend Your Data](#)

PROGRAM GUESTS CONTINUED



Douglas G. Carlston

is the founder of Broderbund Software, Inc., the nation's leader in developing software programs that educate children through entertainment. An honors graduate of Harvard Law School, Carlston founded Broderbund in 1980 and quit his law practice following the success of its first two games. At Broderbund, he fostered a culture of creativity that led to the development of many innovative products, including the best-selling *Where in the World is Carmen San Diego?* series that teaches geography and history, the *Myst* adventure game, *Kid Pix Studio* and *Print Shop* that teaches art and design skills, and the *Living Books* animated versions of children's classics. His company has utilized interactive electronics, state-of-the-art graphics, animation, and sound to bring the adventure and joy of learning to millions of young people each day. "Kids want to learn, but they want to do it themselves," says Carlston, who created Carmen Sandiego based on childhood games he played. "They play for fun and learn without realizing it."



James Q. Crowe

is President and Chief Executive Officer of Level 3 Communications, a telecommunications company for the Internet age, built around a single, continuously upgradable, high-speed, fiber-optic network using Internet protocol (IP) technology to provide high-speed transmission of voice, data, fax and video. James Crowe earned a BS in mechanical engineering at Rensselaer Polytechnic in Troy, New York, and an MBA at Pepperdine University. He was Group Vice President of construction giant Morrison Knudsen before moving to Peter Kiewit Sons' Inc. in 1986. At Kiewit, Crowe built one of the first networks to compete with the regional Bells, MFS Communications. Under Crowe's leadership MFS garnered a strategic position in the burgeoning Internet by acquiring Unet Technologies. MFS was sold to WorldCom Inc. at the end of 1996, and Crowe became Chairman of WorldCom, but soon returned to Kiewit, where he was given control of Kiewit Diversified Group, Inc., soon spun off to become Level 3. With Level 3, Crowe is poised to build the first commercial communications network to be based entirely on packet switching, without the older phone companies' burden of supporting an existing single-circuit system. "Helping people communicate is what gets me up early in the morning and keeps me up late at night," he says.

Michael S. Dell

is the founder of Dell Computer Corporation. A child prodigy from Austin, Texas, Michael Dell applied for a high school



from Austin, Texas, Michael Dell applied for a high school equivalency diploma at age eight. By 13 he was speculating profitably in gold, silver and stocks. In his freshman year at the University of Texas, he saw an irresistible opportunity; he bought surplus PCs at cost from overstocked retailers, added memory and disk drives, and sold them to local businesses at 10 to 15 percent under the retail price. By spring break he was selling more than \$50,000 a month. At age 18 he formed Dell Computers with \$1,000 of his own savings. Running the business out of his dorm room, he recorded sales of more than \$180,000 in the first month. Within a decade, he was Chairman and CEO of an international computer giant with more than \$12 billion in annual revenues.



Craig O. McCaw

is the founder of Cellular One and Chairman of Teledesic. When Craig McCaw's father died, his mother was forced to liquidate the family businesses one by one to pay his debts and taxes. All that was left was one tiny cable system in Centralia, Washington. While only a sophomore in college, Craig McCaw took the helm of the business. He expanded the cable business and gradually switched into the new and untested field of cellular telephone service. He borrowed astronomical sums, gambling that the portable phone, a standard feature of the millionaire's limousine, would become a fixture in the workman's pick-up truck. By the end of the 1980s, McCaw's Cellular One was the best known brand in the business, and McCaw Cellular had built a national network that dwarfed its competitors. McCaw sold the cellular business to AT&T for \$11.5 billion. Before selling his company, McCaw personally took over one of its subsidiaries: Teledesic. Teledesic is now preparing to build a global network of 840 low-altitude satellites to provide Internet-like transmission of digital data to the farthest corners of the Earth.

Mario Morino, Ph.D.

is Chairman of the Morino Institute, a nonprofit organization he founded in 1994 to help people and communities find ways to use the Internet to achieve positive economic and social change. Key activities of the Institute include youth development initiatives that provide enriched learning opportunities through the Internet to children in low-income communities; and the Institute's own Netpreneur Program, which supports and nurtures the growing community of the Greater Washington Area's digital age entrepreneurs. Mario Morino's career spans some 30 years as a business leader, social entrepreneur, and authority on information technology. He is best known for his contributions in the area of information technology. In 1973, he co-founded Morino Associates, one of the earliest computer software firms. Morino Associates merged with another firm to create Legent Corporation in 1989, which grew to be one of 10 largest software firms in the world. Morino retired from Legent in 1992, and in 1995, Legent was acquired by Computer Associates in one of the largest transactions the computer software and services industry had seen up to that time. Morino is also Founder and Chairman of the Potomac Knowledge Way Project, an initiative to prepare and educate the Greater Washington region to compete in the information and communications industries of the 21st century.



Nathan P. Myhrvold, Ph.D.

is Director of Technology at Microsoft Corporation and one of the most influential leaders in American technology. A precocious student, he graduated from high school at age 14 and earned his college degree in mathematics and a masters in



geophysics and space sciences at UCLA. Myhrvold then added a masters in economics and a doctorate in theoretical physics from Princeton. Meantime he taught himself programming and began tinkering with computers. He won a postdoctoral fellowship with physicist Stephen Hawking at Cambridge, then took a leave of absence and, with \$10,000 from savings and

friends, moved to Berkeley to start a software company. In 1986 his venture was acquired by Microsoft, and three years later, he was selected as their chief "technologist." He is now guiding the software giant's charge into the multimedia future.



Catherine B. Reynolds

is Chairman and Chief Executive Officer of EduCap Inc. and the founder and Chairman of Servus Financial Corporation. She helped create the private-loan student market and commands one of the most dominant corporate pioneers in her industry. Ms. Dunlevy brought entrepreneurial flair to a business defined by government regulations and revolutionized the entire student loan industry. She introduced the first asset-backed securitization structure utilizing credit-backed education loans in

a AAA offering, and today billions of dollars of these offerings are completed annually. In an effort to provide financial products to help produce an educated citizenry, her companies have originated nearly \$3 billion of assets.

Additionally, Ms. Dunlevy has founded a unique and innovative Internet financial services company that "private labels" a wide array of financial products for many of America's largest companies, including Microsoft, BancOne, Apple, and Wells Fargo Bank. Known for her passion and belief that education is still the best avenue to the American Dream, Ms. Dunlevy devotes a substantial amount of her time and resources to this mission.

Michael J. Saylor

is the Founder, President, and CEO of MicroStrategy. One of the leading visionaries of high technology, Michael Saylor saw that retailers, banks, credit card companies, even fast-food chains, had all compiled massive warehouses of data, but had no way of extracting the information they needed, when they needed it. Just two years out of college, after working at DuPont for only 18 months, he garnered a grant of \$100,000 from his former employer and used it to build a \$53 million company. Saylor pioneered what he calls ROLAP (Relational On-Line Analytical Processing), which enables businesses and individuals answer very specific questions by processing very large sets of data. Today MicroStrategy, quartered in a 17-story Philip Johnson building in Vienna, Virginia, has more than 750 employees. Its stock price rose over 225% within months of its issue. Out of more than 500 corporate customers (including Wal-Mart, K-Mart, Sprint, MCI, AT&T, American Express and United Airlines) over 100 pay \$250,000 a year for MicroStrategy software and services like DSS Suite (Decision Support Software). And Michael Saylor is just getting started. "We think we've found the next great market," he says, "...the ability to provide information to everybody, everywhere, anytime." In March 2000, he announced the foundation of a new online university to provide a first-rate college education over the Internet, free of charge.



