I. Innovation in The Software Industry

- The Canadian Software Industry
- The Internet Industry
- The Multi-faceted Business of Software
- Many Kinds of Software
- Hardware-enabled Software Paradigms
- Drucker's Sources of Innovative Opportunity

The Canadian Software Industry
(Data from Branham Group, Ottawa)

- 100 top independent Canadian software companies
  - FY98 revenues of $3.4B, 37% increase over FY97
  - FY97 increased 35% over FY96
  - Currently employ almost 20,000
  - 67% of revenues from exports
- 50 top Canadian professional services companies
  - FY98 revenues of $3.5B, 80% increase over FY97
  - FY97 increased 38% over FY96
  - Currently employ almost 30,000
- 25 top software and service multinationals in Canada
  - Revenues of $18B, over 45,000 employees

The IT and Internet Industries

- Millions of people
- Tens of millions of Web sites
- Hundreds of millions of Web pages
- Billions of email messages per day
- Tens of billions of $ in Internet startup valuation (despite the inevitable correction)
- Hundreds of billions of $ of e-commerce
- U.S.$250B current U.S. software industry

Multi-faceted Software Business

- *Remember, as you search for entrepreneurial opportunities, that the business of software includes not only software development, but activities as diverse as market analysis, training, information publishing, and electronic commerce. Thus software innovation need not consist of new paradigms or proprietary algorithms, but can also be based on other innovations, such as the novel coupling of technology and application, or a new approach to distribution, training, or support. (#1)*

Software-related businesses

- Consulting
- Contract software development
- Systems integration
- Software product development
- Software product publishing and marketing
- Software distribution
- Value added reselling

Software-related businesses (cont'd)

- Technical documentation
- Customer support
- Training
- Industry analysis and publishing
- Electronic publishing, CD/ROM, multimedia
- Internet-based information services
- Electronic commerce
- Internet portals

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Many Kinds of Software

- Systems software
  - Operating systems, languages, utilities
  - Software engineering, CASE
  - Networking and communications

- Applications software
  - Industrial automation, computer-aided design
  - Business software, personal productivity software
  - Electronic mail, conferencing, groupware

- Media and information
  - Games, multimedia, educational software
  - Information access and resource discovery

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Hardware-enabled Software Paradigms

- *Scan technology trends carefully looking for new hardware paradigms that could open up and enable new software paradigms and applications. These paradigms are sometimes called "killer apps." New software paradigms, such as the spreadsheet, object-oriented programming, CASE, hypertext, neural nets, groupware, and electronic commerce open up new domains for vigorous entrepreneurial activity. (#2)*

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New Paradigms

• IBM Mainfr.	Capacity planning	Best 1
• HP minis	RDBMS+4GL	PowerHouse
• PC	PC software develop.	Basic
• Apple II	Spreadsheet	Visicalc
• IBM PC	Integrated Productivity	Lotus 1-2-3
• IBM PC	PC tax software	TaxPrep
• Mac	Desktop publishing	PageMaker
• SGI Workst	Sensual 3D design	Alias Research
• Networks	Groupware	Lotus Notes
• The Internet	Global comm+inform.	Netscape
• Hand-held...	Pen-centric software	Palm Pilot apps
• Wireless	Wireless software	Cell phone apps
• The Internet	Virtual stores	Amazon.com

Drucker's
Sources of Innovative Opportunity

- *Search for sources of innovation systematically, as Drucker asserts is possible, looking at (#3):*
  - New knowledge
  - The unexpected
  - Process need
  - Changes in industry or market structure
  - Demographics
  - Incongruities
  - Changes in perception, mood or meaning.

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New knowledge

- New hardware paradigms
- New software paradigms and proprietary algorithms

New hardware paradigms

- Highly || machines enabling new approaches to weather forecasting, exploration, IR, etc.

- VLSI graphics chips enabling new applications in computer animation, simulation, VR, etc.

- Multimedia technology enabling new applications in entertainment, education, etc.

- Ubiquitous computing enabling new applications in office and home

- The Internet enabling new communications and information access applications

New software paradigms and proprietary algorithms

- The spreadsheet
- The relational database management system
- Windowing environments
- Object-oriented programming
- Hypertext
- Neural nets
- Performance modelling algorithms

New software paradigms and proprietary algorithms (cont'd)

- Speech recognition algorithms
- Handwriting recognition algorithms
- Groupware
- Information resource discovery engines
- Intelligent agents
- Digital video editing and authoring

The unexpected

- Use of "scientific" computers for business
- Success of the personal computer
- Use of Lotus macro languages and HyperTalk by non-programmers
- Penetration of PCs in the home
- Success of the Internet
- Licensing of the Macintosh operating system
- Success of electronic commerce

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Process need

- Interfaces between systems and standards
- Software to emulate one environment in another environment
- Compilers to replace interpreters, e.g., DBase-Clipper
- More generally, performance enhancements
- Novel coupling of technology to application, e.g., Aldus PageMaker
- Network design and management tools

Process need (cont'd)

- Software metering tools
- Virus immunization and other computer security software and services
- Universal mailbox software
- Email filtering software
- Internet security and privacy software

Changes in industry or market structure

- Innovations in promotion, e.g., Lotus
- Innovations in pricing, e.g., Borland
- Innovations in distribution, e.g., shareware, open source software
- Innovations in packaging, e.g., software suites
- Decentralization/communications replacing travel, hence the need for electronic mail

Changes in industry or market structure (cont'd)

- Merging of computing and telecom opens opportunities for groupware

- Opening up of Eastern Europe provides new markets for technology and software

- Increasing use of multimedia for entertainment, education, advertising

- New publishing and distribution options via the Internet

- New willingness to carry out financial transactions over the Internet

Demographics

- Increasing amounts of home-based business

- Increasing amounts of telecommuting

- Increasing numbers of female executives

- Continuing high levels of illiteracy

- Increasing numbers of elderly people

- Growing expectations in "developing countrie

- Increasing numbers of skilled people who hav been "downsized"

- Increasing numbers connected to the Net

Incongruities

- Discrepancies between reality as it actually is and reality as it is assumed to be or as it "ought to be," e.g.....

  - "High-level" languages not very high-level, hence the need for 4GLs

  - Voice mail is just electronic answering machine technology hence straightforward; not true, hence "voice mail surgeons" needed

  - Everything you want to know is on the Net, yet you can't find it, hence search engines needed

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Changes in perception, mood, or meaning

- "I'm mad as hell and I'm not going to take it anymore" leads to "the computer for the rest of us" and increasing emphasis on ergonomics and "user friendliness"
  - Success of the Apple Macintosh
- Computer as a gateway to communications and information rather than a stand-alone device
  - Growth of the Internet