

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

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The Canadian Software Industry

(Data from Branham Group, Ottawa)

- 100 top independent Canadian software companies
 - FY2000 revenues of \$4.5B
 - 22% compounded growth per annum since 1996
 - FY2000 employment over 27,000
 - Most revenue from exports
- 50 top Canadian professional services companies
 - FY98 revenues of \$3.5B
 - FY98 employment almost 30,000
- 25 top software and service multinationals in Canada
 - FY2000 revenues of \$17.4B
 - FY2000 employment over 49,000

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The IT and Internet Industries

- Millions of people
- Hundreds of millions of Web sites
- Billions of Web pages
- Tens of billions of email messages per day
- Tens of billions of \$ of e-commerce per year
- U.S.\$250B per annum — U.S. software industry

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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)*

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Software-related businesses

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

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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

• 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 Workstations	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
• DVR	On-demand TV	Tivo

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Drucker's Sources of 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

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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

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New software paradigms

- The spreadsheet
- The relational database management system
- Windowing environments
- Object-oriented programming
- Hypertext
- Neural nets
- Groupware
- Intelligent agents

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Proprietary algorithms

- Performance modelling algorithms
- Speech recognition algorithms
- Handwriting recognition algorithms
- Information resource discovery engines

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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
- Sept. 11

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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., page layout for electronic publishing

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Process need (cont'd)

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

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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

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Changes in industry/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 availability of broadband enables multimedia entertainment and education
- New publishing, distribution, and commerce opportunities via the Internet

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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 countries”
- Increasing numbers of skilled people who have been “downsized”
- Increasing numbers connected to the Net

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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
 - Email is real time text communication; not built for conversation, hence instant messaging
 - 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 ... not going to take it anymore”
 - “The computer for the rest of us” ... the Macintosh
 - More emphasis on ergonomics, “user friendliness”
- Computer as gateway to communications and information rather than a stand-alone device
 - Growth of the Internet
- Sept. 11th ...
 - Technological options to travel
 - Technology for security
 - Responses to cyber-terrorism

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