

## IVa. Proprietary Capability, Content, and Technology

- Service, Content, and Product
- Success Factors in Service
- Success Factors in Content
- Project Estimation and Management
- Prototyping and Software Engineering
- Software Specifications
- Software User Interfaces

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.1

## Service, Content, and Product

- *Consider carefully the advantages and disadvantages of selling a service, assembling and enabling access to content, packaging and marketing a product, or various combinations of service, content, and product. (#20)*

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.2

## Service, Content, and Product (cont.)

- Services
  - Low start-up costs, and usually less risky, but...
  - Slower growth, lower profit potential
- Content
  - Slow growth or very high start-up costs
  - 1999 darling of investment community (portals), crash in 2000-01, still viable where content is of value?
- Products
  - High gross margins and growth potential, but...
  - High start-up costs, but very risky and competitive

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.3

## Combinations of service, content, and product

- Service in products
  - Consulting, support, training
  - Source of differentiation and extra revenue
- Products in service
  - Packaged toolkits, methodologies, code libraries — Source of competitive edge
  - Packaged training videos — Source of expanded market, extra revenue
- Content in products
  - Templates, databases sold with software tools

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.4

## Combinations of service, content, and product (cont.)

- Leveraging, bootstrapping a products company from a services company
  - Cognos — Successful
  - HCR — Unsuccessful
- From service to products to products and service: Netron
- Products with content being the profitable “annuity”: TaxPrep

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.5

## Software Service Success Factors

- *Clients contract for consulting and software-related services because they do not want to hire permanently or cannot find critically needed skills; your success as a consultant/contractor is based on the degree to which you can professionally, skillfully, and consistently deliver high quality and knowledgeable service such as advice, management assistance, software development, or training. (#21)*

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.6

## Why clients hire consultants, contractors

- Unique distinctive competence
- Training, bootstrapping one's own staff
- Inability to find or hire qualified staff
- Lead time
- Another point of view
- Arbitrate internal organizational conflict
- (CYA) “Cover your *gluteas maximus*”

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.7

## Consulting, contracting distinctive competences

- Knowledge of a particular application area
- Knowledge of a particular technology:  
forecasting, introduction, usage, optimization
- Ownership of proprietary technology
- Skill in computer systems integration
- Skill in project management of large jobs
- Skill in imparting knowledge to others
- “Either they want the service you have, or they don’t, and you change it.” (Karen Holtzblatt)

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.8

## Marketing of consulting and contracting services

- The goal: To be known as the expert, e.g., Don Tapscott, James Martin, InContext Enterprises
- Professional achievements
- Industry involvement
- Articles in trade publications
- Books, newsletters, or industry reports
- References and “word of mouth”
- “How much do you know about your competition? Everything!!!” (Josef Kates)

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.9

## Success Factors in Content

- Speed to market
- Comprehensive and authoritative content
- Marketing budget
- Strategic alliances
- Revenue model (e.g., advertising, e-commerce, subscriptions)

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.10

## Software Project Estimation and Management

- *Software development, whether carried out for clients or internally for purposes of product development, is notoriously prone to cost overruns. You must therefore estimate carefully, monitor progress, and re-estimate assiduously, using methods such as “divide and conquer,” Delphi, and post mortem. (#22)*

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.11

## *Class project management exercise*

- *Recall a major success or failure in terms of delivering software on time and on budget with which you were personally involved or with which you are familiar.*
- *What were the top one or two reasons for the success or failure of this project?*
- *Answer very briefly including your full name.*

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.12

## Estimating software projects

- Why it's hard
  - It's never the same
  - Specifications are vague, even for products
  - "Clients" change their mind, even internal clients, i.e., product managers
  - Communication problems with the client
  - Communication problems within the team

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.13

## Estimating software projects (cont.)

- Estimating
  - Divide and conquer, estimate smaller pieces
  - Delphi, combining independent estimates
  - Post mortem, comparison to past projects
- Regular tracking and re-estimation

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.14

## Managing software projects

- Methodologies and management techniques
  - Thorough development plans
  - Design and code reviews
  - Regular progress reports (no excuses!!!)
  - Microsoft “synch-and-stabilize” approach
  - Open communication
  - Responsibility and accountability, hierarchical negotiated estimation

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.15

## Managing software projects (cont.)

- Tools
  - Project management systems
  - Workstations, programming environments
  - Tools for testing and documentation
  - Electronic mail, internal communications

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.16



## Brooks's Law

- *Always remember Brooks's Law: Adding more manpower to a late project makes it later. (#23)*
- Why Brooks's Law
  - Start-up, training time
  - Communications time
  - Work reorganization time and impact

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.17

## Brooks's Law (cont.)

- What to do when the schedule slips
  - Despite allowances for slippage.....
  - The perils of delusion
  - Facing the music
  - Levelling with clients — mutual interests
  - Going into overdrive with existing staff
  - Rewarding the overdrive

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.18

## Software Prototyping and Software Engineering

- *Use exploratory programming and software prototyping to experiment with new product ideas, including both functionality and interface; then employ more rigorous processes of software engineering to structure the carrying out of product development. (#24)*

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.19

## Exploratory programming and software prototyping

- Exploratory programming
- The need for iterative design
- The need for prototypes
- Roles for prototypes
  - Concept exploration
  - Communication with management
  - Communication with potential users

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.20

# Software engineering

- Iterative cycles through stages of:
  - Requirements analysis
  - Software specifications
  - Design and documentation
  - Implementation
  - Debugging
  - Installation
  - Maintenance and enhancement

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.21

# Software engineering (cont.)

- Need for organizing methodologies, e.g.
  - Top-down design, bottom-up implementation
  - Structured walkthroughs, design reviews
- Need for software tools to assist the process
  - Computer Aided Software Engineering tools

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.22

## Software Specifications

- *Develop software specifications after prototyping but before carrying out product development; these must include:*
  - *metaphors and mental models through which the user will comprehend the product*
  - *required functionality*
  - *the look-and-feel of the interface*
  - *processor, memory, and other hardware requirements*
  - *performance requirements. (#25)*

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.23

## Software User Interfaces

- *A critical component of any piece of software is its user interface, which determines how it looks and feels to its users; effective interfaces are designed through a process that is user-centred, iterative, and multi-disciplinary. (#26)*

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.24

## The interface

- What is the interface?
  - Where the human user and the computer meet
  - The look and feel of the software
- The importance of interfaces
  - Human time more important than machine time
  - Marketing appeal of good ergonomics and “user-friendly” systems
  - The success of the Macintosh
  - The success of the GUI
  - Beyond the GUI

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.25

## User interface design

- User-centred design
  - User involvement, e.g., participatory design
  - Mental models / metaphors, e.g., desktop, checkbook, how system and interface understood by users
- Iterative design
  - Prototyping
  - User testing
- Multi-disciplinary design
  - Behavioural science
  - Graphic design

---

The Business of Software Jan.-April 2003 ©1992-2003, Ronald M. Baecker Slide 4a.26

## Software for all

- Over 1 in 10 users have some disability
- Number increasing... demographics of aging
- Examples from other domains: curb cuts, closed captioning... relevance to everyone
- Try to increase potential user base
  - Motor access, e.g., through just the keyboard as well as keyboard and mouse
  - Sensory access, e.g., for colour-blind users
  - Different skill levels, e.g., novice, expert
  - Multi-cultural, linguistic, learning style, gender issues