Software Solution Selection: Buy or Build

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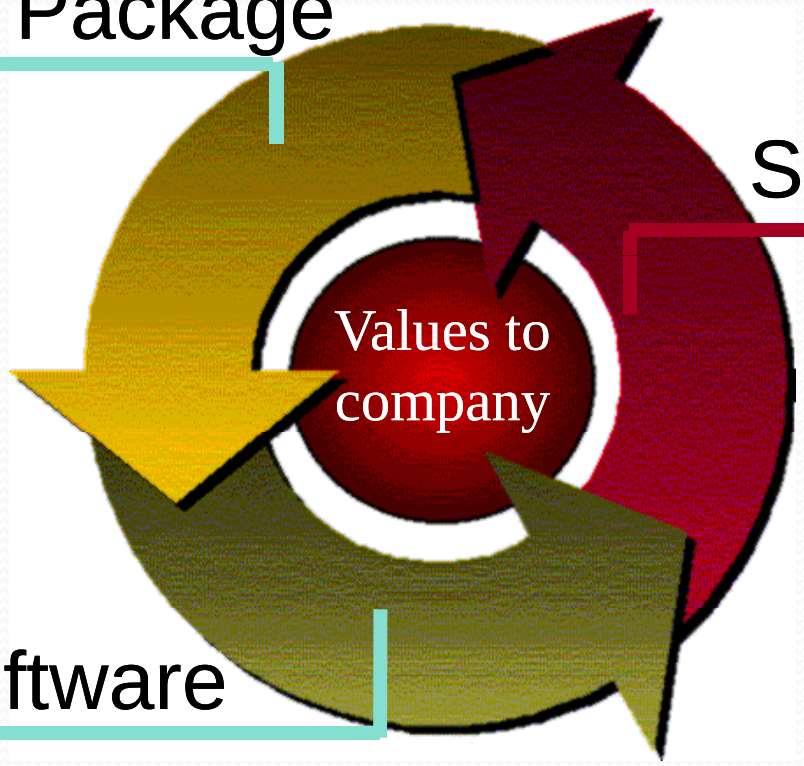
Agenda

- For or against shrink-wrapped software!
- How about tailoring a shrink-wrapped software?
- Tailor-made software quality assurance
- Outsourcing Project Management
- Risk Management on software projects
- Overall Software Assessments, Benchmarks, and Best Practices

Circle Game?

Tailor Software Package

- Seems more reliable
- Have hidden risks
- May be worse



Software Package

- As Is
- Follow others
- For generic tasks

Tailor-made Software

- In-house development
- Outsourcing project

For software packages

- Independent Verification & Validation (IV&V)
- Formal Assessment
- As Is, no flexibilities
- Follow others best practices
- Suitable for generic tasks
- Skill set readily available

Against software packages

- Relies on user-defined requirements
- Predicting with test data
- Hands-on evaluation
- Controls to generate comparable results
- Integration: Plug & Pray
- Side effects, e.g. on performance

Tailoring shrink-wrapped software!

- Seems more reliable
- Have hidden risks
- May be worse
- Still needs Requirement Engineering
- Project Management still essential
- Quality assurance like totally tailor-made

Similar to the challenges faced by tailor-made projects

Tailor-made Software Quality

- Extreme Chaos: within 300K projects in Y2K
  - 28% projects succeeded
  - 23% projects failed
  - 49% project challenged
- Relative Costs to Repair
  - 0.1 – 0.2 Requirements
  - 0.5 Design
  - 1 Coding
  - 2 Unit Test
  - 5 Acceptance Test
  - 20 Maintenance

Tailor-made Software Quality

- The CHAOS Ten
  - Executive Support 18
  - User Involvement 16
  - Experienced Project Manager 14
  - Clear Business Objectives 12
  - Minimized Scope 10
  - Standard Software Infrastructure 8
  - Firm Basic Requirements 6
  - Formal Methodology 6
  - Reliable Estimates 5
  - Other 5

Tailor-made Software Quality

- Do you agree: if you cannot measure, you cannot manage?
- ISO 9001 – 2000
- TQM
- CMMI
- Six Sigma
- The V Models

The V Model (I)

SYSTEM IMPLEMENTATION	SYSTEM ACCEPTANCE
Operational or Business Needs (verify)	Acceptance Test (validate needs)
Define Requirements (verify)	System Test (validate req.)
Design System (verify)	Integration Test (validate design)
Build System (verify)	Unit Test (validate build)

- Verify → Validate

The V Model (II)

- START CODING
- ←---------- Verification ----------→
- Code and Do
- Test and Check
- ←---------- Validation ----------→
- Correction Complete

Outsourcing Project Management

- Project Life Cycle
  - Software Development Life Cycle (Waterfall)
  - Unified Process with iterations
- Requirement Engineering Process
  - Use Case Studying
  - UML Modeling
- User Acceptance Test
  - Test Plan before Coding
  - Regression Testing

Risk Management

- Risk Assessment
- Risk Control
- Cost & Time Control
- Change Management
- Configuration Management

CMMI Assessment Method

- Organizational focus

- Five levels scale:

SEI Maturity Level	Meaning	Freq. of Occurrence
1 = Initial	Chaotic	75%
2 = Managed	Marginal	15%
3 = Defined	Adequate	8%
4 = Quantitatively Managed	Good to excellent	1.5%
5 = Optimizing	State of the art	0.5%

36 Key Factors

- Classification factors
- Project-specific factors
- Technology factor
- Sociological factors
- Ergonomic factors
- International factors

Classification Factors

- Systems software (control physical devices)
- Commercial software (standard packages)
- Information systems software (for own business)
- Outsourced software (developed under contract)
- Military software (comply to DoD standards)
- End User software (private for personal use)

Project-specific Factors

- Size of the application
  (LOC, function points, ...)
- Complexity of the application
  (cyclomatic, essential, ...)
- Constraints of the application
  (performance, schedule, security, ...)
- Nature of the project
  (new, enhancement, maintenance)
- Type of the application
  (internal, external, military, ...)
- Scope of the application
  (program, subsystem, system, ...)

Technology Factors

- Formal methodology (SDLC, UP, RAD, ...)
- Project management & development tool suites
- Defect prevention approaches (JAD, TQM, ...)
- Defect removal tools (code inspection, tests, ...)
- Programming language used
- Reusable materials available

Sociological Factors

- Experience level of development team
- Experience level of project managers
- Experience level of clients
- Organizational structures & specialists available
- Morale factors (overtime, stress, …)
- SEI or SPR capability level of development team

Ergonomic Factors

- Size of private office space
- Interruptions & distractions
- Meeting space available
- Network & remote support communications
- Telecommuting support for work at home
- Video conferencing facilities for clients

International Factors

- Local laws or union regulations
- Communication channels
- Variations in compensation levels
- Variations in public holidays & vacation periods
- Variations in staff compensation levels
- Variations in national work habits

Questions & Answers

Mission

- To provide training to both end users, management people, and software developers to understand:
  - Quality Software for end users
  - Quality Direction for management
  - Quality Process for developers

Our Beliefs:

- Quality-focus, targeting at medium / small size organizations
- Better understanding & communication leads to better software usage