Software Project Management
CS6704: Class 13

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Agenda

◆ Discussions
  ● Turn in Homework
  ● Reading Discussion
  ● Review last weeks class

◆ Portfolio Management: A Discipline for Managing Investments
  ● Break

◆ Dialogue on Software Project Management Project

◆ Homework/Project Assignment
Fall Semester Timeline

Class Begins PM Basics
Managing with Metrics
Emerging PM Paradigms

Aug — Sept — Oct — Nov — DEC

Software Project Planning
Mid-Term Exam
Program Management
Final Exam

Software Process and Life Cycle
Software Estimation
Risk Management
Human Side of PM
Project Portfolio Management

Reading Discussions...

- “Embracing Change with Extreme Programming” by Kent Beck
- “Extreme Programming from the CMM Perspective” by Mark Paulk
- “Launching Extreme Programming at a Process Intensive Company” by James Grenning
- “Recovery, Redemption, and Extreme Programming” by Peter Schuh
- “Using Extreme Programming In a Maintenance Environment” by Charles Poole and Jan Willem Huisman

4 weeks, 2 sessions... So much to do & so little time ...
... When is the Project Due? 😊
Evolution of Application Infrastructure

- Objects
- Components
- Architectural Layering
- Formalized Interfaces (User and System)
- Isolated Application Data
- Mixed Application and Data

Why a Common Bus?

Higher

Flexibility, Scalability, and Serviceability Improvement

Lower

Harvard Business School Studies...

- Five Key SW Development Practices
  1. An early release of evolving product to customers
  2. How often incorporation of new software (code)
  3. Rapid feedback on design changes
  4. A broad-based experienced team with several shipments under their belt
  5. Major investments in the product

- Key Findings:
  - Evolutionary approaches reduce
  - Releasing lower functionality versions improves overall project performance
  - The quicker the feedback, the higher the
  - Uncertainty dictates short microprojects (detailed to the level of individual features)

Manifesto for Agile Software Development

We are uncovering better ways of developing software by doing it and helping others to do it. We value:

- Individuals and interactions over processes and tools
- Working software over comprehensive documentation
- Customer collaboration over contract negotiation
- Responding to change over following a plan

Signed … XP, Crystal, SCRUM, folks, …

Emerging Development Methodologies

Extreme Programming (or XP)
by Kent Beck, Ward Cunningham, and Ron Jeffries

??? Development by Robert Charette

??? Methods by Alistair Cockburn

???-K by Ken Schwaber and Jeff Sutherland …Rutgers University

Key Factors

- Customer Value – Results…
- Individual Capability – Skills…
- Collaboration – innovation via group interaction
- Adaptation – Change responsive…
- Minimalism – Simple…
Extreme Programming

- Small and Frequent Releases
  - Daily builds and two-week releases to ???
- Merciless Refactoring
  - Iterative ??? process incorporating learning principles
- Continuous Integration / Relentless Testing
  - Unit Test and ??? Driven
- Planning Game and Story Cards
- System Metaphor/Simple Design
- On-site customer
- Collective ??? ownership

Powerful XP Team Principles

- Right Size Team
  - Size teams for efficiency, stability, and effective communications
- Self-Selecting Team
  - Developers “???” for positions
  - Self-motivation results in higher ???
- Pair Programming
  - Enhances collaboration, knowledge transfer, and creativity
  HOW?
  - Two developers at the same ???
- Internal Control for Knowledge Retention
  - Ensures internal developers are being used
  - Maintains business control of projects
- 40 hour work week – Why?
It’s About Teams

- Stand up meetings – Well known techniques to control ???-???
- Pair programming – XP approach to reducing ???
- Collective Code Ownership – XP and beyond Code Ownership
- The customer is here with us – Ready to show the latest increment of software...
- ????-????-????? – Know what you don’t know and don’t know what you don’t know

Documentation: Less is More

- Planning instead of a ???
- User Stories instead of ???
- CRC cards instead of design ???
- Tests instead of ???
- The code speaks for it self instead of comments – Yikes...
- Metaphor instead of class diagrams
- You still need to create a User Manual
The Planning Game

- Business Creates Stories — Describe desired function
- Development Assigns Costs — Time estimates should be between 1 and 3 weeks
- Business Creates Commitment Set — Can be story- or data-driven
- All processes should be collaborative and use iteration

Why?

User Stories

- Separate ??? and technical decisions
- Stories must be based on a ???
  - Knowledge doesn’t fit on paper
- Customers don’t always know what they want
  - You must dig deep and ask questions

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*8-Simple but Effective System Enables Collaboration, Communications, and Traceability*
Continuous Integration/Relentless Testing

Why is this Feature Driven?
• Plan?
• Design?
• Build?

So What do Project Managers Do?

◆ Look after the ??? and other project’s ???
◆ Solve process and organization problems
◆ Maintains the precious developer-customer ???
◆ Has a sense of direction and overall scope when the customer does not
Key Lean Development Principles

- *Everything is changeable* (change tolerance)
- *Domain solutions* (not point solutions)
- *Complete, don’t construct*
- *Minimalism is essential*
- *Needs determine technology*
- *Product growth is feature grow* (not size growth)
- *Success depends on active customer participation*
- *Development is a team effort*

Source: Robert Charette

Portfolio Management

- Key to Project and Program Success
  - Programs of Initiatives of Projects of Tasks
  - Businesses of Business Units of Products/Services of Assets
  - They are all about investments!
- A Discipline for Managing Investments
- A Discipline for Managing Assets
- Economic View of Performance in a Changing Business World
Value Changes in many Dimensions

- What People Value Changes
  - People
  - Business
  - Processes
  - Applications
  - Technology
  - Metrics
  - Service levels

- Software Project Management is about managing the changing portfolio of IT assets

Current IT Value Trade-Offs

- Short-Term Savings
  - Cuts of up to 30%
  - Mostly Projects!
  - May cut “muscle”
  - Unsustainable

- Long-Term Goals
  - Increase IT Value
  - Foster innovation, agility, high performance
  - Cut operations cost
  - Create sustainable IT cost model
Manage IT Assets Like a CFO

- Assess Value in Current IT Products and Services
- Incorporate Value of New Products and Services
- Apply Accounting Principles
  - RONA, IRR, CBA, ...
- Force Fully Allocated Costs for Products and Services

You cannot value – nor manage – assets in the IT portfolio that are not measured

Basic IT Value Proposition

\[
\text{Value} = \frac{\text{Performance}}{\text{Price}}
\]

- Performance (IT Drivers)
  - Reduce Risk
  - Increase Customer Satisfaction
  - Reduce Cycle Time
  - Increase Productivity
- Price (Market)

IT value is proportional to the degree it risks or enhances value of the information that it delivers
Business Perception of IT Value

IT value is both real and perceived – evidence of this perception is in the management measures.

Portfolio Management Ecosystem

Business/IT Strategy

Enterprise Priorities

Adjust Project Portfolio

Project Portfolio Management

Manage Portfolio Execution

Implement Projects/Programs

New/Modified Assets

Operational Process

Program Management Process

Asset Retirements

Asset Portfolio Management

Assess Value

Identify Asset Improvements

Manage Asset Usage

Assess Value

Operational Process

Program Management Process
Portfolio Planning Considerations

- What investments have been made?
  - Approved projects
  - Assets already purchased
  - Skills/competencies
- What investments are being considered?
- What resources are available to invest?
- Which investments meet your desired mix of risk and return?
  - What is expected return?
  - What is acceptable risk?

An Example IT Portfolio Asset Model

Information Assets
- Information Continuum (data -> knowledge)
- Business Models/Rules
- Repositories
- Intelligence/Measures

Technology Assets
- Business Applications
- IT Infrastructure/OPS
- Methods and Tools
- Relevant Architectures

Human Capital Assets
- Staff/Skills Mix
- Relationships Corporate, LOB, Customers, Suppliers

Process Assets
- Business & Tech. Processes
- Value Stream
- Innovation
- Customer
Assessing Information Assets

- What is the business’ dependence on information assets? What competitive advantage does it provide? What is its value proposition?
- What do the information assets contribute to business decisions? Strategic or tactical?
- What is the cost to create, manage, and dispose of the asset? Replacement cost?
- What technical factors affect the value of the information (e.g., timeliness, quality, processing value add)? Are these factors understood by both IT and the business?
- How many stakeholders receive value from the information? How important are they to the business?
- Is the information managed from the information continuum perspective (i.e., data, information, knowledge)? Is value allocated accordingly? ...

Assessing Technology Assets

- Does the technology asset support business strategy? Is it part of the technology plan? Do IT and business executives share an understanding of key value propositions?
- How many clients does the asset support? Are they direct or influencing stakeholders? Is the value stream clear?
- How many users does this asset support? Is the user growth rate sustainable? Does the architecture support the evolution of IT products and services?
- What is the technical condition of the assets? What is its projected longevity? What is the perceived business value of the assets?
- What percent of projects come in on-time, on-budget, and within-specification? Are they the important ones? Are process, methods, and tools effective in delivering IT products and services? ...
Assessing Infomediary Process Assets

- What are the key processes in delivering value? What cross-process activities that drive value? How well does the value in an organization flow through the process?
- Does the IT organizational structure align with business and technical objectives? Are teams managed for effective performance? Are contractors and outsourcers managed effectively with teams?
- Are the business, information, technology, and process architectures consistent and integrated? What processes are strategic? Commodities? Does the IT financial plans reflect these opportunities? Investment ROI?
- What is your process maturity? Are you performing at levels appropriate for your business? Are you nearing the strategic inflection point where moving to the next level of maturity will have significant ROI?

Assessing Human Capital Assets

- Are there enough IT staff to accomplish the technical and business objectives? Do staff have the requisite skills? Are the skills and experience mixes right for the work plan?
- Does the training program assure intellectual capital retention and growth? Is there an attitude for learning?
- What is the business' perception of IT credibility? Levels of trust and respect? Are negotiations difficult or productive? IT groups responsive or reactive?
- How often do IT and business executives communicate? Is it enough to support the spectrum of business decisions that involve IT? Are value propositions clear?
- At what levels do IT and the business have managed relationships? How is IT involved in relevant business decisions? Are expectations managed effectively? ...
Basis for IT Portfolio Investment

- **Value Maintenance** — managing ongoing, non-discretionary investments in IT assets
- **Value Enhancement** — discretionary investments in improving or growing IT asset base
- **Value Exploration** — venture into high-risk/high-payoff IT investments

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Maintain Existing IT Asset Value

- IT liability avoidance and value retention
- Fund baseline costs for critical business operations, maintenance, and support
- Skeleton funding based on minimum headcount and costs to keep system running
- Incentives to reduce baseline costs

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![Diagram](image_url)
Enhancing Existing IT Asset Value

- Strategic priorities
  - Investments criteria
  - Investment process
- Phased funding on projects with interim deliverables
  - Jump-start
  - Initial capability
  - Advanced function
- Continued allocations through project value and delivery commitments being met and communicated

Exploring Future IT Asset Value

- Requires dynamic mindset for quick response to value and market changes
  - Digital Planning for agility
- Value Enhancement investment criteria plus:
  - Business/Market advantage
  - 2-3 year ROI/IRR projection
  - Clear exit strategy
- Manage using a venture funding model – close and regular interactions
Managing the IT Asset Portfolio entails examining how much risk an organization can afford and applying the appropriate investment strategy.
IT Portfolio Analysis

At the core of managing the portfolio of IT assets is an investment model that evaluates the business value and technical condition of the assets on a time continuum.

Building and Managing Relationships

Value is Earned in Building and Managing Key Relationships at Appropriate Levels.
Vendor Portfolio

- **Strategic Partners**
  - Relationship management
  - Collaboration
- **Preferred Providers**
  - Custom catalogs
  - Tailored interactions
- **Commodity Suppliers**
  - Interchangeability
  - Transaction standardization
  - Unit cost & availability

As with other portfolios, risk management is a key consideration in Vendor Relationship Management.

Organizing Infrastructure Portfolio

- **Structure shared infrastructure resources into discrete, manageable domains**
Homework Assignment for 12/3/01

- Readings
  - None...Work on Project
- Search the Web for Portfolio Management Articles pertaining to Project Management
- Project: Due On December 10th.
- Have a great week!