Software Project Management
CS6704: Class 14

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Agenda

◆ Discussions
  ● Review last weeks class
◆ More Portfolio Management: Prioritization
◆ Break
◆ Dialogue on Software Project Management
  Project and Final Exam
◆ Homework/Project Assignment
Fall Semester Timeline

- Class Begins: PM Basics
- Aug: Software Project Planning
- Sept: Mid-Term Exam
- Oct: Managing with Metrics
- Nov: Program Management
- DEC: Emerging PM Paradigms
- Final Exam

3 weeks, 1 session... So much to do & so little time 😊

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 ???
- A Discipline for Managing ???
- Economic View of ??? in a Changing Business World
Value Changes in many Dimensions

- What People Value Changes
  - ???
  - Business
  - Processes
  - Applications
  - ???
  - Metrics
  - ??? levels

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

Manage IT Assets Like a CFO

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

You cannot ??? – nor ??? – assets in the IT portfolio that are not measured
Portfolio Planning Considerations

- **Key Questions:**
  - What investments have been made?
  - What investments are being considered?
  - What resources are available to invest?
  - Which investments meet your desired mix of risk and return?

**Risks, Rewards, and Resources**

- Money
- People
- Growth
- Time
- Customers
- Value
- Risks
How should we assess each of these?

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

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

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

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

Basis for IT Portfolio Investment

- Value ??? — managing ongoing, non-discretionary investments in IT assets
- Value ??? — discretionary investments in improving or growing IT asset base
- Value ??? — venture into high-risk/high-payoff IT investments
Maintain Existing IT Asset Value

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

Enhancing Existing IT Asset Value

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

Prevent Business ???

IT Investment Budget

Value Maintenance

Invest in ??? Assets According to Business Strategy

IT Investment Budget

Value Enhancement

Value Maintenance
Exploring Future IT Asset Value

- Requires dynamic mindset for quick response to value and market changes
  - Digital Planning for agility
- Value investment criteria plus:
  - Business/Market advantage
  - 2-3 year ROI/IRR projection
  - Clear strategy
- Manage using a venture funding model – close and regular

Poster with Value Exploration, Value Enhancement, and Value Maintenance.

Portfolio Analysis

- Technical Condition vs. Business Value
  - Excellent
  - Poor
  - Low
  - High

- New Development
  - Re-evaluate/Reposition Asset
  - Maintain/Evolve Asset
  - Retire/Consolidate Asset
  - Reengineer/Modernize Asset
Building and Managing Relationships

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

Vendor Portfolio

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

As with other portfolios, risk management is a key consideration in V??? R??? M???
Following on the Same Project Track

- The project is the key value delivery vehicle...
  - How much economic value will be sourced from key projects?
- True or False: Critical resources and focus often goes to the “squeaky wheel” project vs. projects of higher priority and value
- No matter what the value of the project, is the limiting factor the annual IT budget
  - Project funding is habitually under-estimated due to uncertainty and optimism

Would you Agree that...

- Crisis/Risk management has become the predominant form of delivery
- You can not create value unless you manage expectations and risks
- Risk is the biggest threat, obstacle, AND opportunity to creating value!
Relevance versus Prevalence

- Is it a prevalent problem?
- How widespread? Who has it?
- Is it a relevant problem?
- What is the value of solving it?
- Who owns it?
- Is it a prevalent opportunity?
- How wide is the window of opportunity?
- Is it a relevant opportunity?
- Who is it important to?
- What is the value of solving it?

Project Leadership Practices

Must...

- Link business value to project results
- Enact systems which estimate resource/funding requirements accurately
- Develop project leadership competencies from a skills and process perspective

Too often, the portfolio of projects commit scarce resources to an imbalance of risk/value
Balancing Project Portfolio Value

Portfolio Change Risk
- Manifold Changes
- Increasing Costs
- Custom Applications
- Uncontrolled Process

Value Leverage Opportunity
- Increasing Change Tolerance
- Value Clear to Business
- Adaptive Architectures
- Domain Architectures

Understanding Value and Its Key Parts

Consumer Confidence
- Brand Loyalty
- Value Equity
- Performance
- Information

Customer Convenience
- Business Model
- Business Practices
- Buying Experience
- Relationship Quality

Customer Value
- Needs & Wants
- Preferences
- Expectations
- Value Realized
Conveying Project Value

- Value is not granted unless it is recognized by its constituents
- Focusing on project efficiencies fosters a commodity mentality
- Balance begins by being effective and then identifying efficiencies

Finding the Balance . . .

Retaining Value by Scoring the Risks

- Key Project Risk Categories
  - Human Resources
  - Project Requirements
  - Project Management
  - Project Complexity
  - Size
  - Architecture
  - Level of Innovation
- Scoring these across all projects enables effective project prioritization and selection/rescoping/delay/disposition
### Project Risk Scoring Example

<table>
<thead>
<tr>
<th>Category</th>
<th>Project Risk Factors</th>
<th>Wgt. (1-10)</th>
<th>High (3)</th>
<th>Med (2)</th>
<th>Low (1)</th>
<th>Score</th>
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<tbody>
<tr>
<td><strong>Human Resources</strong></td>
<td>Avg. Project Team Experience</td>
<td>8</td>
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<td>&gt;9 yrs.</td>
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<td>Avg. Project Team Size</td>
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<td>Customer Relationship with Team</td>
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<td>Oka y</td>
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<td></td>
<td>Business/IT Staff Alignment</td>
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<tr>
<td></td>
<td>Senior Management Involvement</td>
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<tr>
<td><strong>Project Requirements</strong></td>
<td>Rate of Change (i.e., volatility)</td>
<td>10</td>
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<td>Med</td>
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<td>Scope Control</td>
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<td>Business Change Rate</td>
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<td>High Assurance Requirements</td>
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<td>Use of Standard Methods and Tools</td>
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<td>Level of Quality Assurance</td>
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<td>User Interface Complexity</td>
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<td>&lt;3 m</td>
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<td><strong>Architecture</strong></td>
<td>Business Process Defined</td>
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<td>Level of Innovation</td>
<td>Change to Business Process</td>
<td>8</td>
<td>High</td>
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<td>Change to Organizational Structure</td>
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Traditional Financial Performance Methods Lose Traction with Uncertainty

- Discounted Cash Flow (DCF)
- Net Present Value (NPV)
- Benefit/Cost Ratio (BCR)
- Return on Investment (ROI)
- Return on Net Assets (RONA)
- Internal Rate of Return (IRR)
- Economic Value-Add (EVA)

*Traditional financial methods put emerging technology investments at risk by not accounting for future*
Real Options Analysis: In Short

- **Create Options**: Structure options to account for dynamics and uncertainty of decisions
- **Establish Value of Options**: Continuously assess over time (not a one-shot deal)
- **Manage Options Implementation**: Monitor progress and be prepared to exercise contingencies (earn the flexibility with hard work here)
- **Realize the Value**: Recognize the value as it is realized — introducing “options thinking”

Real options analysis lends itself well to emerging technologies, offering flexibility and a future focus

---

Readings so far… What is your top 5?

1. “Software Engineering Project Management” by Richard Thayer
2. ++ “Anchoring the Software Process” by Barry Boehm
3. “Theory W Software Project Management: Principles and Examples” by Boehm and Ross
4. “Using the WinWin Spiral Model: A Case Study” by Boehm,
5. +++ “The Nine Deadly Sins of Project Planning” by Steve McConnell
7. ++ “Software Development Cost Estimation Approaches” by Barry Boehm
8. ++ “Enhancing the COCOMO Estimation Models” by Joanne Hale
10. “Software Estimation Perspectives” by Barry Boehm
11. “How Solved is the Cost Estimation Problem” by Lawrence Putnam
14. “What are Function Points” by Capers Jones
15. ++ “A Practical View of SW Measurement…” by M. Daskalantonakis
16. ++ “Evolutionary Project Management” by Stuart Woodward
17. ++ “Software Management Metrics” by Herman Schultz
18. “Large-Scale Project Management is Risk Management” by Robert Charette
19. ++ “Managing Risk in SW Maintenance” by Robert Charette
20. “Implementing Risk Management …” by Edmund Conrow
21. ++ “Stages of Team Development” by Karen Mackey
22. ++ “The Mythical Man-Month: AFTER 20 Years” by Fred Brooks
23. ++ “Human Capital” by Tom DeMarco and Tim Lister
24. ++ “Selecting a Project’s Methodology” by Alistair Cockburn
25. ++ “Embracing Change with Extreme Programming” by Kent Beck
26. ++ “Extreme Programming from the CMM Perspective” by Mark Palk
27. “Launching Extreme Programming at a Process Intensive Company” by J. Grenning
28. “Recovery, Redemption, and Extreme Programming” by Peter Schuh
29. “Using Extreme Programming In a Maintenance Environment” by Charles Poole and Jan Willem Huisman
30. ++ “Critical Chain Scheduling and Buffer Management” by Francis Patrick
Homework Assignment for 12/10/01

- **Readings**
  - None...Work on Project
- **Project: Due On December 10\textsuperscript{th}.**
- **Have a great week!**