Project Classification

- To adopt a “one size fits all” approach to every project is just asking for trouble.
- Your approach to managing any project must adapt to the characteristics of the project.
- A classification rule can help you choose that approach.

Classification by Project Characteristics

- Risk
- Business Value
- Duration
- Complexity
- Technology used
- Number of departments affected
- Cost

The Ten Project Management Knowledge Areas

- Project Integration Management
- Project Scope Management
- Project Time Management
- Project Cost Management
- Project Quality Management
- Project Human Resources Management
- Project Communications Management
- Project Risk Management
- Project Procurement Management
- Project Stakeholder Management
Ch03: What Are the PM Process Groups?

Project Risk Management – Process

- What are the risks?
- What is the probability of loss that results from them?
- How much are the losses likely to cost?
- What might the losses be if the worst happens?
- What are the alternatives?
- How can the losses be reduced or eliminated?
- Will the alternatives produce other risks?

Risk Management – Risk Identification

- Technical risks
- Project management risks
- Organizational risks
- External risks

Risk Identification Matrix Template

<table>
<thead>
<tr>
<th>Risk Categories</th>
<th>Scope</th>
<th>Time</th>
<th>Cost</th>
<th>Quality</th>
<th>Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Project Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Figure 03-02

Risk Identification – Candidate Risk Driver Template

<table>
<thead>
<tr>
<th>Risk Driver</th>
<th>Event</th>
<th>#</th>
<th>Probability</th>
<th>Impact</th>
<th>Priorit</th>
<th>Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tech Scope</td>
<td>TS01</td>
<td>Y</td>
<td>Available HW/SW technology limits scope</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tech Time</td>
<td>TT01</td>
<td>Y</td>
<td>Integrating technologies impacts schedule</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tech Cost</td>
<td>TC01</td>
<td>Y</td>
<td>Unexpected need to acquire hardware</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tech Quality</td>
<td>TQ01</td>
<td>Y</td>
<td>Technology limits solution performance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tech Res</td>
<td>TR01</td>
<td>Y</td>
<td>New/unfamiliar technology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proj Mgt Scope</td>
<td>PS01</td>
<td>Y</td>
<td>Senior scope change request too significant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proj Mgt Time</td>
<td>PT01</td>
<td>Y</td>
<td>Schedule too aggressive</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proj Mgt Time</td>
<td>PT02</td>
<td>Y</td>
<td>Interproject dependencies compromise schedule</td>
<td></td>
<td></td>
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<tr>
<td>Proj Mgt Time</td>
<td>PT03</td>
<td>Y</td>
<td>Task duration estimates too optimistic</td>
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</tr>
<tr>
<td>Proj Mgt Time</td>
<td>PT04</td>
<td>Y</td>
<td>Difficulty scheduling meetings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proj Mgt Quality</td>
<td>PQ01</td>
<td>Y</td>
<td>Inaccurate assumption</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 03-02
Ch03: What Are the PM Process Groups?

Risk Management – Risk Assessment

- What is the probability of loss that results from them?
- How much are the losses likely to cost?
- What might the losses be if the worst happens?

Static Risk Assessment Matrix

Dynamic Risk Assessment Worksheet

Some organizations use a 1-5, or 1-10 metric.
Ch03: What Are the PM Process Groups?

Vendor Solicitation – Evaluation – Forced Ranking

<table>
<thead>
<tr>
<th>Consultant</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>Rank</th>
<th>Sum</th>
<th>Forced Rank</th>
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<tbody>
<tr>
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<td>2</td>
<td>4</td>
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<td>6</td>
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</table>

Vendor Solicitation – Evaluation – Paired Comparison

<table>
<thead>
<tr>
<th></th>
<th>1</th>
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<th>4</th>
<th>5</th>
<th>6</th>
<th>SUM</th>
<th>RANK</th>
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<td>1</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>X</td>
<td>0</td>
<td>6</td>
</tr>
</tbody>
</table>

Project Stakeholder Management

- Sponsors
- Clients
- Customers
- Business process engineers
- Resource managers
- Project manager
- Business analysts

Mapping Knowledge Areas to Process Groups

- What the mapping means
- How to use the mapping
- Using process groups to define PMLCs
- A look ahead: Mapping process groups to form complex PMLCs
**Ch03: What Are the PM Process Groups?**

Mapping Knowledge Areas to Process Groups

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>INTEGRATION</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>SCOPE</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>TIME</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>COST</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>QUALITY</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>HR</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>COMMUNICATIONS</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>RISK</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>PROCUREMENT</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>STAKEHOLDER</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**Hints in Deciding which PMLC Model to Use**

- The degree to which the RBS is complete is the major factor in deciding which PMLC Model to use.
- Consider using the highest level of decomposition in the Objective section of the PGS and leaving creation of the RBS and WBS for the Planning Phase.
- The highest level requirements could be those that deliver business value. Senior managers might prefer this.
When to Use Each PMLC Model

<table>
<thead>
<tr>
<th>PMLC Model Type</th>
<th>When to Use It</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear</td>
<td>The solution and requirements are clearly defined. You do not expect too many scope change requests. The project is routine and repetitive. You can use established templates.</td>
</tr>
<tr>
<td>Incremental</td>
<td>Same conditions as the linear approach, but the client wants to deploy business value incrementally. There may be some likelihood of scope change requests.</td>
</tr>
<tr>
<td>Iterative</td>
<td>You feel that requirements are not complete or may change. You will learn about remaining requirements in the course of doing the project. Some features of the solution are not yet identified.</td>
</tr>
<tr>
<td>Adaptive</td>
<td>The solution and requirements are only partially known. There may be functionality that is not yet identified. There will be a number of scope changes from the client. The project is oriented to new product development or process improvement. The development schedule is tight and you can’t afford rework or re-planning.</td>
</tr>
<tr>
<td>Extreme</td>
<td>The goal and solution are not clearly known. The project is an R &amp; D type project.</td>
</tr>
</tbody>
</table>

Table 04-02

TPM – Traditional Project Management

<table>
<thead>
<tr>
<th>GOAL</th>
<th>CLEAR</th>
<th>NOT CLEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>TPM</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Characteristics
- Low Complexity
- Few Scope Change Requests
- Well-Understood Technology Infrastructure
- Low Risk
- Experienced and Skilled Project Teams
- Plan-driven TPM Projects
Two categories of TPM Models

- **Linear PMLC Models:**
  - Standard Waterfall Model
  - Rapid Development Waterfall Model

- **Incremental PMLC Models:**
  - Staged Delivery Waterfall Model
  - Feature Driven Development (FDD) Model

---

**Linear PMLC Models**

- **Definition:**
  - A Linear PMLC model consists of a number of dependent phases that are executed in a sequential order with no feedback loops. The complete solution is not released until the final phase.

- **Characteristics:**
  - Complete and clearly defined goal, solution, requirements, functions, and features
  - Few expected scope change requests
  - Routine and repetitive activities
  - Use established templates

---

**When to Use**

- Projects that are repetitive
- Simple, short duration projects
- Projects contained totally within a single department and use no outside resources

**Linear PMLC Models:**

- Standard Waterfall Model
- Rapid Development Waterfall Model

---

**Strengths**

- Entire project is scheduled up front
- Resource requirements are known
- Does not require the most skilled resources
- Team members do not have to be co-located

**Weaknesses**

- Does not accommodate change very well
- Costs too much
- Takes too long before any deliverables are produced
- Requires complete and detailed plans
- Must follow a rigid (inflexible) sequence of processes
- Is not focused on client value
Linear PMLC Model 1: The Standard Waterfall

- Project definition
- Requirements gathering
- Design
- Development
- Testing
- Implementation
- Operation

Ch02: What Is Project Management?

Incremental PMLC Model

Definition:
- An Incremental PMLC model consists of a number of dependent phases repeated in sequential order with no feedback loops.

Characteristics:
- Same as Linear PMLC model.
- Need to release deliverables against a more aggressive schedule.

Considerations in Choosing a Variation
- Decomposing the project into parallel and independent swim lanes.
- Swim lane cohesiveness (together feeling!).
- Increased risk.

Incremental PMLC Models
When to Use
- To get to a partial product or service to market sooner
- To get partial solution to the end user sooner

Incremental PMLC Models:
- Staged Delivery Waterfall Model
- Feature-Driven Development Model

Strengths
- Produces business value early in the project
- Enables you to better schedule scarce (limited) resources
- Can accommodate minor scope change requests between increments
- Offers a product improvement opportunity
- More focused on client value than the Linear PMLC model

Weaknesses
- The team may not remain intact between increments
- Requires hand-off documentation between increments
- Must follow a defined set of processes
- Must define increments based on function- and feature dependencies rather than business value
- Requires more client involvement than Linear PMLC models
- An Incremental PMLC model takes longer than the Linear PMLC model
- Partitioning the functions and features may be problematic

NOTE: The feature sets are prioritized based on technical dependencies in order to determine the build sequence.
APM – Agile Project Management

**SOLUTION**

<table>
<thead>
<tr>
<th>Clear</th>
<th>Not Clear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Clear</td>
<td>A Critical Problem without a Known Solution</td>
</tr>
<tr>
<td>Business Opportunity</td>
<td>A Previously Untapped (unused) Business Opportunity</td>
</tr>
<tr>
<td>Critical to the Organization</td>
<td>Meaningful Client Involvement is Essential</td>
</tr>
<tr>
<td>Use Small Co-located Teams</td>
<td></td>
</tr>
</tbody>
</table>

**Goal**

Clear

APM

**Understanding the source of change**

- Agile Project Management is a set of tools, templates and processes for managing projects whose goal is clearly defined but whose solution ranges from partially unknown to almost totally unknown.
- Agile Project Management addresses new problems/business opportunities with high complexity & uncertainty but their success is critical to the business.

**Research and Development**

- R: Research
  - Unstructured methods
  - Difficult to plan
  - Unpredictable
- D: Development
  - Structured methods
  - Generally planned
  - Predictable

Our focus is on downstream development.
PMLC models can be used for Agile Projects can be broadly classified into 2 categories:

- **Iterative**: (used when most of the solution has been discovered)
  - Prototyping, Evolutionary Development Waterfall, Rational Unified Process (RUP), Dynamic Systems Development Model (DSDM), Adaptive Software Development (ASD), Scrum.

- **Adaptive**: (used when most of the solution is unknown)
  - Adaptive Project Framework (APF)

**Definition:**

An Iterative Project Management Life Cycle (PMLC) model consists of a number of phases that are repeated in groups with a feedback loop after each group is completed. At the discretion of the client the last phase in a group may release a partial solution.

**Characteristics:**

- The solution is known but not to the expected depth (i.e., features are not complete)
- Often uses iconic or simulated prototypes to discover the complete solution
- Scope Phase: Implementation of Intermediate solutions can be problematic. Final solution cannot be defined at the start of the project
- Plan Phase: Complete plan for building the known solution & Partial plan for the high priority functions
Iterative PMLC Models

When to Use
- Most but not all of the solution is clearly known
- You might otherwise have chosen the Incremental PMLC model but have a strong suspicion that there will be more than a minimum number of scope change requests
- You might otherwise have chosen an Adaptive PMLC model but are concerned about lack of client involvement

Iterative PMLC Models:
- Prototyping Model
- Evolutionary Development Waterfall Model
- Rational Unified Process (RUP) Model
- Dynamic Systems Development Model (DSDM)
- Adaptive Software Development (ASD) Model
- Scrum (overfull)

Strengths
- Client can review current partial solution for suggested improvements
- Scope changes can be processed between iterations
- You can adapt it to changing business conditions

Weaknesses
- Requires a more actively involved client than Linear and Incremental PMLC models require
- Requires co-located teams
- Implementation of intermediate solutions can be problematic
- Final solution cannot be specified at the start of the project
Iterative PMLC Model 3: Rational Unified Process (RUP) Model

Iterative PMLC Model 4: Dynamic Systems Development Method (DSDM)


Iterative PMLC Model 5: Adaptive Software Development (ASD)

Iterative PMLC Model 6: Scrum

“Scrum is not an acronym; it is a term taken from rugby. Scrum involves the team as a unit moving the ball down field in what would appear to be an ad hoc or even chaotic manner. Of all the iterative approaches, Scrum would seem to define a chaotic development environment.”
Adaptive PMLC Models

Definition:
Adaptive PMLC models are those that proceed from iteration to iteration based on very limited specification of solution. Each cycle learns from the proceeding ones and redirects the next cycle in an attempt to converge on an acceptable solution. At the discretion of the client a cycle may release a partial solution.

Characteristics:
- Iterative structure
- Just-in-time planning
- Critical mission projects
- Thrives on change through learning and discovery
- Continuously reviewed and adapted to changing conditions

When to Use:
- Have you or a trusted colleague had successful adaptive project experience with this client before?
- If this is the first adaptive experience for this client, have you assured yourself that they will be meaningfully involved throughout the entire project?
- Has the client appointed a qualified and respected co-project manager for this project?

Variations of Iterative PMLC Model:
- Adaptive Project Framework
Adaptive PMLC Models

Strengths
- Continuously realigns the project management process to accommodate changing conditions
- Does not waste time on non-value-added work
- Avoids all management issues processing scope change requests
- Does not waste time planning uncertainty
- Provides maximum business value within the given time and cost constraints

Weaknesses
- Must have meaningful client involvement
- Cannot identify exactly what will be delivered at the end of the project

Extreme PMLC Model

SOLUTION

Ch02: What Is Project Management?

xPM – Extreme Project Management

Characteristics
- R&D Project
- Very High Risk

GOAL
- Clear
- Not Clear

Not Clear
xPM
Clear

Extreme PMLC Model

15
Extreme Project Management

- Extreme Project Management is a set of tools, templates, and processes for managing projects whose goal expresses an ideal state but whose solution for reaching that goal is unknown or unlikely.
- Extreme projects are searching for goals and solutions where none have been found before.

  To converge on a goal and solution with business value is often a hunt in a dark room for something that doesn’t exist in that room but might in another room, if you knew where to find that other room.

One of the major challenges in xPM projects is to terminate the chosen direction at the earliest point where future failure is almost a certainty.

The vast majority of these projects are research projects.

There are two types of PMLC:
- Extreme Project Management Life Cycle (xPM): a model appropriate for projects that have a goal in search of a solution
- Emertxe (pronounced ee-MURT-se) Project Management Life Cycle (MPx): a model appropriate for projects that have a solution in search of a goal

Extreme Project Management

Definition

- Extreme PMLC models consist of a sequence of repeated phases with each phase based on a very limited understanding of the goal and solution. Each phase learns from the preceding ones and redirects the next phase in an attempt to converge on an acceptable goal and solution. At the discretion of the client, a phase may release a partial solution.

**Characteristic:**
- High Speed
- High Change

**Strengths:**
- Keeps options open as late as possible
- Offers an early look at a number of partial solutions

**Weaknesses:**
- May be looking for solutions in all the wrong places
- No guarantee that any business value will result from the project
Ch02: What Is Project Management?

**Emertxe Project Management**

<table>
<thead>
<tr>
<th>GOAL</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear</td>
<td>MPx</td>
</tr>
<tr>
<td>Not Clear</td>
<td>Not Clear</td>
</tr>
</tbody>
</table>

**Characteristics**
- A New Technology without a Known Application
- A Solution out Looking for a Problem to Solve

---

**Comparison of TPM, Agile, Extreme: Technology & Requirements**

- Emertxe project is an Extreme project, but done backwards
- The Emertxe PMLC model looks exactly the same as the Extreme PMLC model
- The differences have to do with the intent of the project:
  - The Extreme PMLC model starts with a goal that has great business value and searches for a way (a solution) to deliver that business value. Not long into the project, you and the client come to the conclusion that a complete solution to the problem as stated doesn’t seem too likely. Then perhaps the next question should be this: What problem can you solve? (These projects are normally research projects.)
  - The Emertxe PMLC model starts with a solution and no goal. You are considering how a great new technology provides business value to your organization.

---

It is typical to adopt the defined (theoretical) modeling approach when the underlying mechanisms by which a process operates are reasonably well understood.

When the process is too complicated for the defined approach, the experimenter approach is the appropriate choice.
Examples of Each Project Type

TPM  Install an intranet network in field office
APF  Put a man on the moon by the end of the decade and return him safely
xPM  Cure the common cold
MPx  ?????

Project Management Life Cycle Approaches

The 5 PMLC Models

Recap of the PMLC Models

Similarities
- All 5 Process Groups are used in each PMLC model
- Each PMLC model begins with a Scope Process Group
- Each PMLC model ends with a Close Process Group
Recap of the PMLC Models

Differences
- The models form a natural ordering (Linear, Incremental, Iterative, Adaptive, Extreme) by degree of solution uncertainty
- The processes that form repetitive groups recognize the effect of increasing uncertainty as you traverse the natural ordering
- Complete project planning is replaced by just-in-time project planning as the degree of uncertainty increases
- Risk management becomes more significant as degree of solution uncertainty increases
- The need for meaningful client involvement increases as degree of solution uncertainty increases

Choosing the Best-Fit PMLC Model

When to Use (1 of 2)

Linear
- Clearly defined solution and requirements
- Not many scope change requests
- Routine and repetitive projects
- Uses established templates

Incremental
- Same as linear but delivers business value early and often
- Some likelihood of scope change requests

Iterative
- Unstable or or incomplete requirements and functionality
- Learn by doing and by discovery

Adaptive
- Goal known but solution not known
- Solution highly influenced by expected changes
- New product development and process improvement projects

Extreme
- Goal and solution not known
- Through iteration converge on goal and solution
- Typically for R&D projects
Additional Consideration

- Total Cost
- Duration
- Market Stability
- Technology
- Business Climate
- Number of Departments Affected
- Organizational Environment
- Team Skills and Competencies