

# Fundamentals of Project Management

CMPUT 299  
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1

## Management is

- People
- Process
- Problem Solving

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2

## People

- Identify skills - have and missing
- Identify personalities
- Match skills and tasks with people
- Run effective meetings

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3

## The Project Team

- Each team member has multiple roles
- Roles are based on needs and skill sets
- What role you play depends on tasks in progress
- Roles should be allocated to balance load during the project.
  - E.g. A writer in the initial phases can be a testor or programmer in the later phases, but not both.

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4

## The Project Team ...

- Certain roles should not be played by same person:
  - Manager - keeps track of tasks
  - Creative Director - maintains artistic vision
  - Producer - keeps project on budget
- Why? Ensure checks and balances
  - CD wants another character,
  - P says ok, but you have to cut area by 50% to remain on budget,
  - M says character programmers are already booked up.

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5

## Process = Planning + Execution

- Problem solving generates tasks
- Planning organizes tasks
- Planning is continuous:
  - Maintain a task queue
  - Assign priority to tasks
  - Assign tasks to people
  - Monitor status to maintain situation awareness
  - Re-evaluate tasks, priorities, assignments

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6

## Planning

Meetings  
+  
Task Queue  
+  
Repository

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7

## Task Queue

- What - name and short title
- Who - who monitors, who acts, who helps
- Priority and timing
- Current status
- Details and links to other tasks

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8

## Task Queue

- The task queue is the key management tool
- Keep it current!
- Keep it short (don't micromanage tasks)
- Review it often!
- Everyone is responsible for monitoring the task queue.

## Repository

- Keep everything in a repository
- Keep under version control
- Maybe keep under access control
- Keep a history of what you did
- Backup the repository!

## Project Phases

- Project is organized as a sequence of phases
- Each phase defines a chunk of progress.
- Producer defines the phases.
- Manager defines details of phases through the task queue.

## 299 Game Project Phases

- Team formation (Jan 24), roles will change!
- Setting (Jan 31), this is the project charter that sets the context
- Design and Plan (Feb 9), what, when, how, contingencies
- Prototype (Feb 27), concrete visualization of game

## 299 Game Project Phases

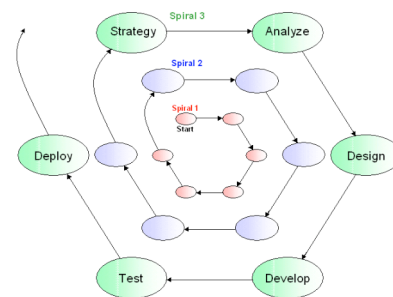
- Design Issues (when ready?)
- Pitch (Mar 28)
- Evaluation (April 11)
- Final Check off (April 11)

## How do you define details?

- Each phase is composed of a set of tasks
- Tasks have dependencies
  - Some tasks need to wait for others to be done
  - Some tasks can be done in parallel
- The more dependencies the higher the risk
- There is a systematic process for defining tasks.

## Fractal Spiral Model for Problem Solving

- A general problem solving process
- Works for all domains
- Iterative and Incremental



## Steps of the Spiral

- Strategy -
  - What are we trying to do?
  - Does it make business sense?
  - How do we measure success?
- Analyze - what do we want to do?
- Design - how are we going to do it?
- Implement - do it
- Test - did we do what we intended?
- Deploy - evaluate and release results to next spiral

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17

## Recursive Spiral Model

- It is self-similar. Each step is executed via a sub-spiral.
- Deployment in a sub-spiral transitions to the next step in the larger spiral.
- Recursion into sub-spirals stops on reaching a step with an obvious well-understood solution.

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18

## Project Spirals

- Project spirals from inside out.
- Each spiral achieves an increment in the project.
- A spiral will have a mix of increment styles as determined by the strategy step of the spiral.

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19

## Spiral Increment Goals

- *Broad and shallow* - covers every subsystem from the outset, but only with limited functionality. Works well for generally understood domains.
- *Narrow and deep* - focuses on substantially implementing a small but problematic subset of the system. Works well with risky parts of the system. Risks are addressed first and can be evaluated before heavy investment in the rest of the system.

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20

## Spiral Increment Results

- *Evolutionary iteration* - builds on the previous ones, discards or modifies very little of the previous effort.
- *Prototyping iteration* - produces an artifact that resolves some issue, or demonstrates some capability. Used to evaluate and manage risk, and is intended to be discarded.

## E.g. Writing a paper for a course

- Strategy: what do I have to deliver when?
- Analyze: choose my topic
- Design: research the topic, outline the structure of the paper
- Implement: write the paper
- Test: ask some one else to read your paper
- Deploy: hand it in.

Each of these requires some mini-problem solving.

## E.g. Writing a paper for a course

- Strategy:
  - What is it about (its domain)?
  - When is it due?
  - What resources do I have?
  - What is it worth (cost/benefit)?
  - How is it marked (evaluated)?
  - Target quality level?

## E.g. Writing a paper for a course

- Analyze:
  - Define topic area,
    - Maybe need a sub-spiral to research and choose a topic if a number of possible topics
  - Choose the focus of the paper
    - What would make it interesting
  - Check consistency with assignment specification!

## E.g. Writing a paper for a course

- Design:
  - Outline the structure of the paper, break into sections
  - Identify role of each section
  - Identify key points in each section
  - Identify how sections are related to each other, dependencies
- This make take a few spirals in itself

## E.g. Writing a paper for a course

- Implement:
  - Go from points to sections
  - Take multiple iterations, each a spiral
  - Narrow and deep versus broad and shallow
  - Each spiral involves evaluation against the previous analysis step
  - Probably revise the analysis as you delve deeper into sections

## E.g. Writing a paper for a course

- Test:
  - Read it over
  - Final reading by someone else
- Deploy:
  - Revise with another spiral if external review fails
  - Hand in if ok or out of time

## E.g. Writing a paper for a course

- NOTE: no hard and fast distinction between stages of a spiral.
- Point is to get the job done, not to find an ideal plan!
- Don't try to be perfect, balance costs and benefits



## Final Comments

- The purpose of project management is to get the project done
- It is not to simply follow a process or produce a bunch of documents
- If it works use it
- Keep track of what works and what doesn't for future projects