Solution Implementation

Senior Design I

Electrical and Computer Engineering

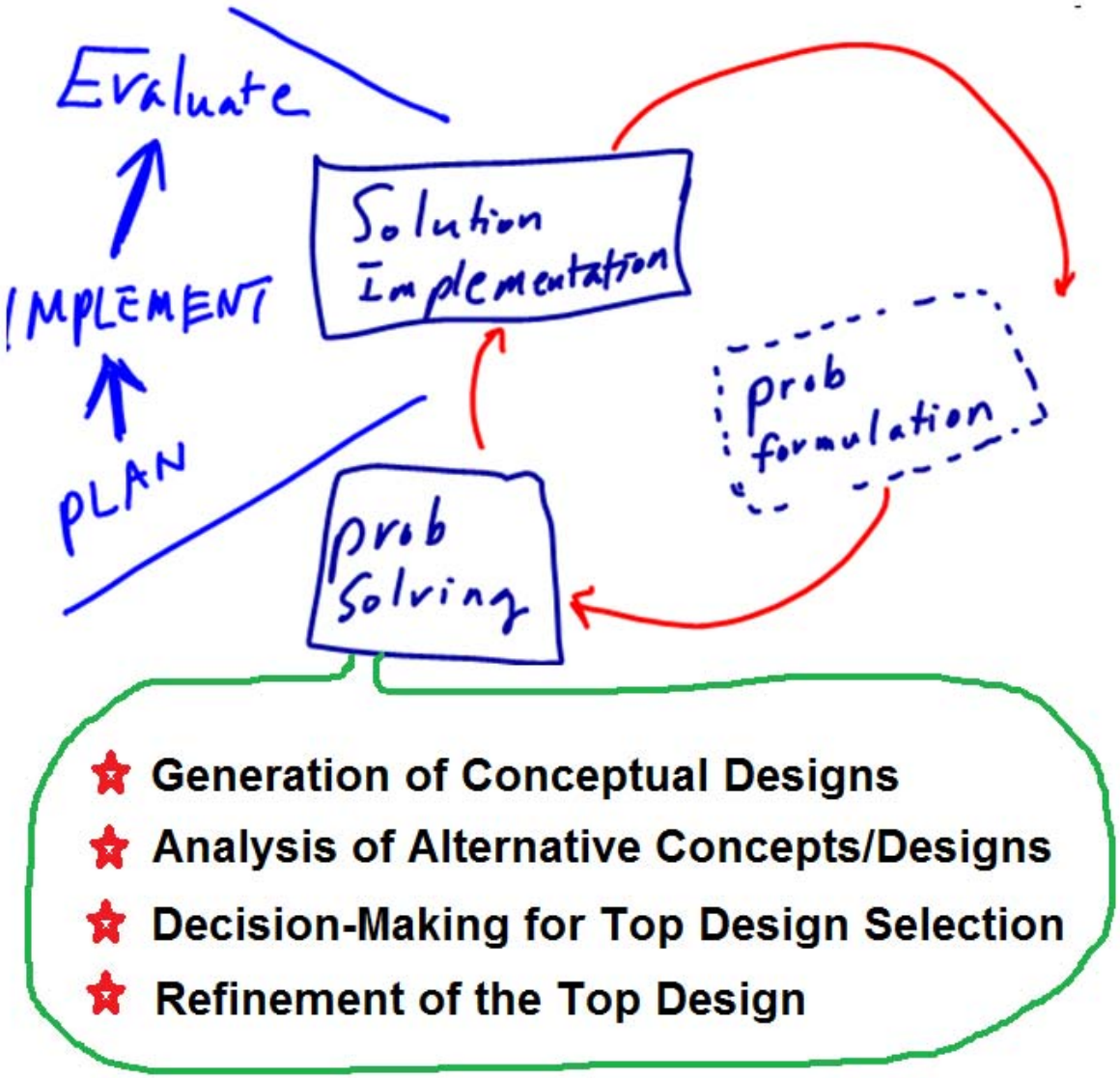
Howard University

Instructor: Dr. Charles Kim

Class note webpage: www.mwftr.com/SD.html

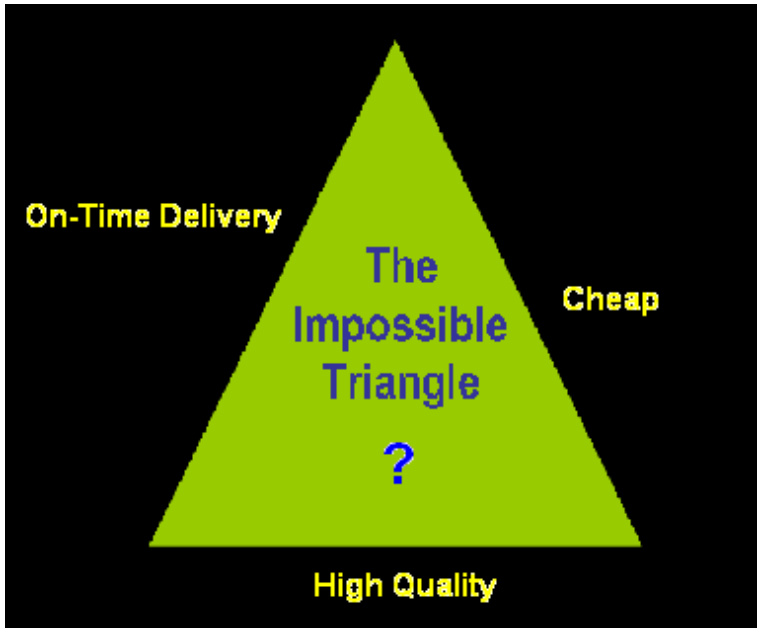
Solution Implementation

Paper Design
Into Reality



Planning for Implementation

- Consideration for Implementation Planning
- Steps of Solution Implementation
- Steps for Evaluation of the final product
- 3 C's
  - Commitment
  - Communication
  - Coordination
- QCD: Key performance indicator
  - We go by
  - **DQC (Delivery – Quality – Cost)**



PLAN

- **What's Involved**
  - **Conversion of Paper Design into Reality**
  - **Make sure the implemented design meets the deign requirements ("Quality")**
  - **Efficient Process to do the work ("Delivery")**
- **PLAN**
  - **"A road map to a goal"**
    - **Outline the navigation route**
    - **Coordinate efforts**
  - **Manage the key resources**
    - **Time**
    - **Personnel**

Components of Implementation Plan

- **TIME**
  - Details of Tasks to be executed
  - The Order the Tasks to be done
- **PERSONNEL**
  - Who will work on which tasks
- **Mutual Understanding** of the PLAN
- **Focus**
  - Produce (implement and **deliver**) high **quality** product **economically**, **environment-friendly**, **on time**

Implementation Planning

- DETAIL
  - You can and should be very detailed with your plan
  - Instead of “construction”
    - Breakdown to much smaller tasks;
    - “order motor”, “manufacture brackets”, “align optical components”
  - Instead of “Coding”
    - Breakdown to much smaller modules;
    - “video module A”, “homing subroutines”, “collision avoidance”,
  - Timeline
    - Gant Chart
    - Spreadsheet
    - Project Calendar

Implementation Planning -continued

- “x3”
  - Everything takes longer than you think – even if you think it will take longer than you think.
    - Parts will not arrive when promised by suppliers
    - Building parts yourself will take longer than expected
    - Software coding takes much longer than you think
  - Rule of Thumb
    - (estimated time) x 3
    - Time estimation is learned only through experience

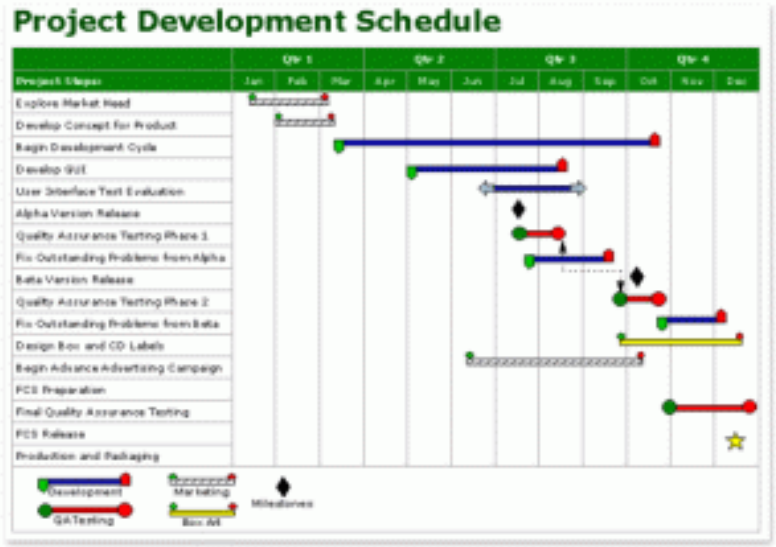
Evaluation Plan (EP) ("System Test Plan")

- Procedures to evaluate a design against all of the design requirements
- Tests
  - Experimentations with prototypes
  - Preliminary lab test
  - Testbed Test
  - Field Test
- Write **Evaluation Plan (Test plans)** against the measurable/quantifiable design requirements
  - **Point: What to test to prove what**
  - Clear
  - Unambiguous
  - **"Must be possible to hand the plan to someone not involved in the design project and have them successfully conduct the evaluation procedures**"

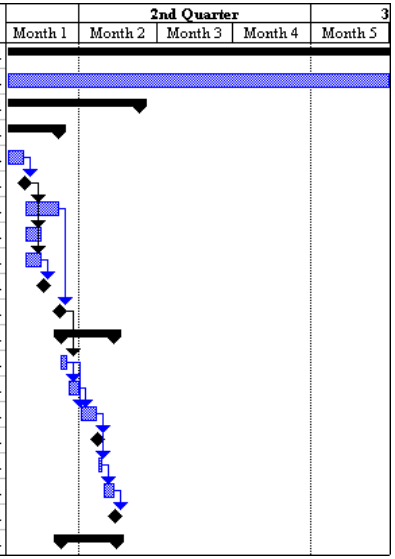
Elements and Timeline should be considered in Implementation and Evaluation Planning --- rough example

- Nov 2014: Final review/refinement of the top design
  - Concept proof
  - Material, component, size, weight, etc
  - Computing platform
  - SDK
- Dec 2014: Component Selection
  - Detailed Design of modules, parts, flowcharts, architectures
- Jan 2014: Component Order and Start of Implementation
- Feb 2015: Functional Testing of modules and System Testing with Integration of modules
- Mar 2015: System Evaluation/Field Tests
- **CAUTION: Your plan must be much more detailed than this rough, coarse example !!! Must be Weekly plan (Not monthly !)**

Implementation & Evaluation Plan - Tools



ID	Task Name	Duration
1	**Project Management**	**120d**
2	Perform Project Management	120d
3	**Detail Planning**	**38d**
4	**Prepare Analysis Document**	**15d**
5	Confirm Inventory of Modules	5d
6	Inventory Complete	0d
7	Develop Code Work Groups	10d
8	Develop System Test Groups	5d
9	Develop Acceptance Test Groups	5d
10	Work Groups Complete	1d
11	Analysis Document Complete	0d
12	**Prepare System Work Plan**	**15d**
13	Develop Tasks	3d
14	Determine Staffing Requirements	3d
15	Prepare Work Plan	5d
16	Preliminary Work Plan Complete	0d
17	Review Work Plan	2d
18	Revise and approve Work Plan	2d
19	Publish Work Plan	0d
20	**Prepare Test Plan**	**16d**



- PERT
- CHART
- **Planner (Fillable Form)**

Fillable Implementation and Evaluation Plan

www.mwftr.com/SD1415.html

PROJECT IMPLEMENTATION AND EVALUATION PLAN
Senior Design Class

Dr. Charles Kim

TEAM NAME: _____

TEAM MEMBERS: _____

_____

MONTH	WEEKLY TASKS		MEMBER In CHARGE	DELIVERABLES
	Week (FROM day TO day)	TASKS		
NOV 14	9 - 15			
	16 - 22			
	23 - 29			
DEC 14	1 - 6			
	7 - 13			
	14 - 20			

Fillable Implementation and Evaluation Plan

MONTH	WEEKLY ACTIVITIES		MEMBER In CHARGE	DELIVERABLES
	Week (FROM day TO day)	TASKS		
JAN 15				
FEB 15				
MAR 15				

MONTH	WEEKLY TASKS		MEMBER In CHARGE	DELIVERABLES
	Week (FROM day TO day)	TASKS		
APR 15				

Implementation and Evaluation Plan - Summary

- Summary
  - Detailed Road Map from Final Design to Reality
    - Finalization of Concept Design
    - Prototype
    - Component selection
    - Component testing
    - System Integration
    - System Testing
    - System Evaluation
    - Etc etc
  - Detailed Plan to achieve quality project and to deliver on time.
  - Weekly Planner with Deliverables
  - Starting from this week

Class Activity - Submission

- Today's Task
  - We will do this as a class activity
  - Much more detailed plan than the example
    - **Implementation and evaluation tasks – Detail (divide into small tasks)**
    - **Weekly Tasks**
    - **Weekly Deliverables**
    - **Members in charge**
  - Use fillable project planner
  - **Submission** required

- REMINDER
  - Submission Due Next Week: Report on Final Design Selection (Decision Matrix) and Details of the Top Design