CH 1

- a project is a fully coordinated group of tasks that are completed by People using resources & processes, projects has start, End dates & success criteria.

- Success criteria: [1] on time [2] on budget [3] according to specefications
- process groups: [1] Initiating [2] planning [3] Executing [4] monitoring [5] closing
- Knowledge Areas: [1] Integration [2] scope [3] Time [4] cost [5] Quality [6] Human Resources [7] communication [8] Risk [9] procurment

Why Do we Need a Project Manager?

Like Orchestra, someone is needed to keep symphony rather them noise, usually projects are cross-functional (different dept.)

Essential elements of a project:

[1] charter / scope / plan

- internal project develop a charter. • Ext. & int. has a scope.

* Scope: the entirety of all work must be accomplished to complete the proj; it is contained within the charter for internal proj. & in contract for ext.

* Scope Statement: a way to clarify the scope, it answers:

[1] the desired result [2] resources & technology [3] assumptions & constrains

Scope Staatement outline:

[1] Project overview: • how to come into being • why undertaken • Scope to be completed • how proj. affect organization • how org. effect proj.

[2] Deliverables: list products / services will be produced.

[3] Features & functions descriptions:

[4] Acceptance Criteria: describe the process that will be used to determine user ac.

[5] Restrictions / constraints: example: material shortage, quality, cost ---

[6] Uncertainties: if - then statements.

* project charter is larger then the project scope.

[2] Project Schedule: intermediate dates beside start / deadline

[3] Project Resources: People / money / time / technology / material

[4] Leadership:

* internal projects: initatives undertaken by firms to enhance their competitiveness.
  - Firms sustain themselves: [1] superior service/cost/time [2] anticipating new markets
  - internal proj. known as "Loss-leader" for temporary loss & future gain (lead)

Difference between project & program?

Program is a series of projects, like university degree is a program, courses are projects.

Goal, Objective, Deliverable?

- Goal: Overall purpose of the proj (in contract for ext. & in charter for int.)
- Objective: collection of tasks to produce deliverable.
- Tasks: collection of activities.
- Deliverable: The actual product/service to be developed by proj. team.
- proj usually have more than one objective & more than one deliverable.
- Scope: comprehensive defenition of a project.
- Duration: the time from beggining to end required to complete an activity, task or obj
- Schedule: a timetable for completing all act., tasks, obj.
- Milestone: acheivement sufficient for billing the customer a persentage
- Process: a series of standarized steps used to produce a given result, examples: initiation, planing, execu- - -

Project Success criteria:

[1] on time [2] within budget [3] meets user specefications.

For a successful project manager, must be effictive at:

[1] Building Teams [2] Leading Project Teams [3] motivate teams
[4] communicate with teams/customer [5] manage time.
[6] manage change [7] manage diversity [8] Leading Periods of adversity

Project Managers Functions:

1 Process Functions:

1 Project Initiation

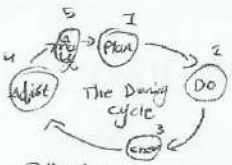
* project managers are chosen before project initiation begins, this allows:
  - (a) establish clear understanding of the customer expectations.
  - (b) establish positive working relationship from the outset.
  - (c) become familiar with all of the project's stakeholders.
* proccesses to be done in project initiation phase:
  1. Project charter, contains:
     - (a) project's purpose (b) objectives (c) success criteria
     - (d) general requriements (e) project discreption (d) product/serrice characteristics
     - (e) sumarry schedule showing milestones (f) project manager
     - (g) name & responspility of indivisuals (h) project approval requirments (how success, who decides)
  2. Project Stakeholders:
     - * Stakeholders: indivisuals & all organaizations that have a stake (intrest) in the project.
     - * it is important not just to identify the stakeholders, but also to create a stakeholder register.
     - * the registry contains the names & positions of all stakeholders and their intrest and expectations of the project.

2 Project Planning

* The most extensive Part, usually associated with project management
  1. Scope of the project:
     - * if not developed as part of initiation, then do it now.
  2. Work Breakdown structure (WBS):
     - * begin with the deliverables and work backward to form work packages
     - * this process is called decomposition.
     - * work package is the lowest level & is used for duration and cost estimate.
  3. Project Schedule:
     - * Can use Professional scheduler / scheduling software
  4. Cost Estimate & Budget:
     - * miscellaneous factors are called enterprise environmental factors and these can be anything that affect the cost, including culture goverenment regulations, market conditions, --

5 Quality Plan:

* how the team will meet & meet customer specification.
* continual improvement.
* Deming cycle:



* Quality improvement: - communicate results, - provide training - report progress...

6 Human Resource Plan: (how to properly staff the project team)

(a) all positions and their responsibilities.
(b) qualification required for each position.
(c) reporting relationships of all personal assigned to the proj.

7 Communication Plan

* ensure generation, collection, storage, retrieval of Proj. info.
* Stakeholders must be up-to-date.
* Proj. mang. must talk to Stak., Teams, organization --

8 Risk Management Plan

(a) Technical Factors
- difficult specefications - Technology - quality beyond capabilities

(b) External Factors:
- difficult supplies - government regulations - market forces.

(c) Internal Factors:
- project's priority - resources avaliability - quality of management

9 Procurement Plan:

* is the process of aquiring materials, services and other outside resources needed.

(a) purchasing decisions (b) relationships (c) changes & errors

3 Project Execution

* execute the plan phase.

4 Project Monitoring & Controlling

* efficitive change order management will prevent Scope Creep
* Scope Creep: adding to scope without compencating the firm.
* Identifying new risks

5 Project Closing

* includes the whole project & Precurement contracts.

2 People's Functions:

1. Leadership Function
2. Team Building Function
3. conflict management Function
4. Motavation Function
5. Communication Function (oil in machine)
6. Time Management (their own time & not proj.)
7. change management
8. Diversity Management
9. Adversity Management

Characterstics of an Effictive Project Manager:

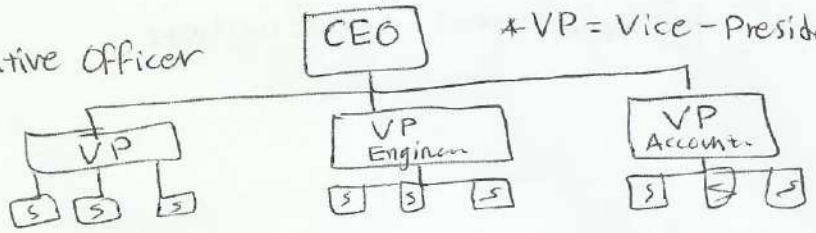
1. Strong Process Skills
2. Strong People Skills
3. Intellectual Cariousity
4. Commitment
5. Vision & Insight
6. People Oriantation
7. character
8. Focus on Solutions
9. Participative & decisive: ask team when decide
10. Focus on The Customer
11. Focus on win-win outcomes
12. Lead by example
13. get the best from all stakeholders

Organaizations Structures:

1 Functional Structure

* Traditional & most-common
* AKA Line Organization
* Have clear lines of authority in terms who reports to whom

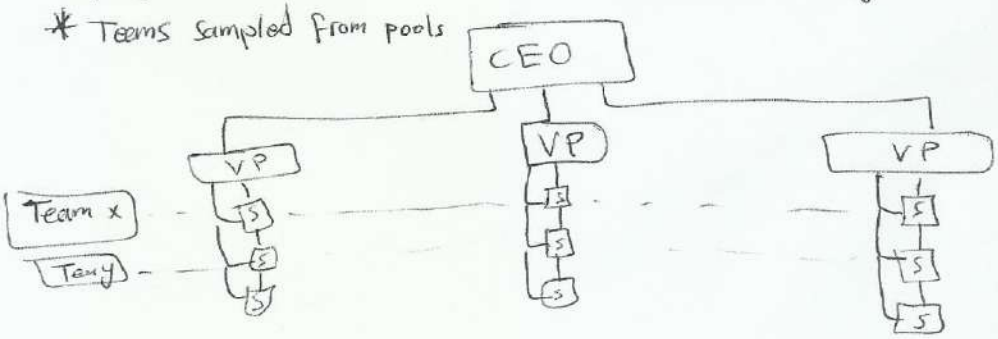
* CEO = chief Executive Officer
* VP = Vice-President
* S = Staff



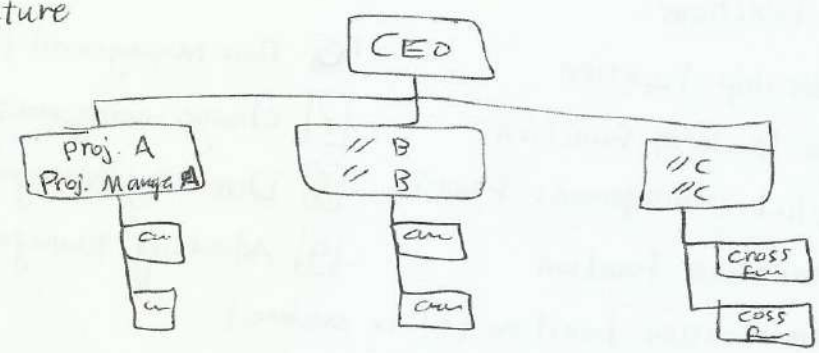
* project manager isn't necessarily have line authority over staff.

2 Matrix Structure

* Teams are always cross-functional in nature
* project mangers don't have line of authority over staff.
* Teams sampled from pools



3 Project Structure



* project mangers have line of authority over Team.
* Project managers will fight over resources if not handled well

Project Management Certifications

1. Project Management Preffessional (PMP): highest level
2. Certified Associate in project management (CAPM): entry-level
3. Program Management proffessional (PgMP): experienced-level
4. PMI Scheduling Proffessional (PMI-SP): Specialized-level
5. PMI Risk Management Proffessional (PMI-RMP): specialized-level

Project Managemcnt Preffessional Examination (PMP)

reaumnts:
1. High-school diploma & 60 months of exp in proj
2. Bachelor degree & 36 month of exp in proj
3. Fomal education in proj. man.
4. info about certification

Project Initiation Inputs:

- RFP/RFQ
- statement of work
- business case
- signed contract

outputs:

1 Project Description: brief but comprehensive overview (high-level)

① what project involves ② who the poject is for ③ why the project important.

2 Project Feasibility Analysis Report

① is the project feasable from a cost-benefit prespective
- is the firm already operating at capacity ?
- Does the project fall within finm's core competencies ?
- is return on investment sufficent (cost vs Benfit)?
- is the customer financially able to meet obligations?

② Best approach to complete it :
- analyze the problem the project is trying to solve.
- Decide what approach is the best.
- develop potential solutions
- identify & compare the adv. vs disadv. of the potential solutions
- make recommendations about best appreach.

3 Project concept Document comphhensive Description (executive-level)

* helps executives take informed decision whether to take or leave the Proj
* before preparing:
  ① Choose Project Manger : because her will create the concept document
  ② Select members of project : ownership feeling towards the proj.
  ③ identify concept input Partners : they will help the team & manage
  ④ identify stakeholders : create stakeholder register.
* outputs:
  ① overview of the project (can be the project description from earlier)
  ② Purpose Statement
  ③ Goals & objectives of the project
  ④ selected approach & stratigies
  ⑤ Financial information
  ⑥ success factors
  ⑦ schedule information
  ⑧ Risk information

4 Project charter the first official document that says "we have a proj"

* any charter has to contain:
  ① General information : Project title / contact info of executive
  ② Project Overview : Project discreption , problem trying to solve, feasability --
  ③ Project Scope : determines whether the cost of change payed by firm.
  ④ Milestones : Large acheirements at 25-50-75-100 %

⑤ Authority & Responsibility : who is responsible for what
⑥ Project organization : chart of hirarchy (customer, exec, PM, Team)
⑦ Disaster Recovery Methodology : IT recovery plan for :
- servers - Storage - software & automation - Network & physical - skills

⑧ Resources & funding : Resarces include time, equipment...
⑨ Signatures : of key stakeholders (minimum exec & PM)

5 Stakeholder Register

* directory of all direct / indirect stakeholders.
* important to find hidden stakeholders (enemies & friends).

6 Project Kickoff Meeting

* meeting to start the project formally, agenda:

① welcome : PM introduces himself
② Introductions : Each team member introduces himself.
③ Disscussion of project charter : understand the big picture.
④ Disscussion of stakeholders : identify hidden stakeholders
⑤ Disscussion of the next steps : who wanna be in project planning
⑥ Questions of the team :

* Why Project Planning ?
- if we don't, then a chain reaction will occur, Emp will start late causing hurry-up mode which affects quality & time, we need overtime cost and redo for quality.
- Saftey, Employees will dispose toxic material in dumpster.

* Project Planning has:
1. Inputs : Project Scope & WBS
2. Tools / Techniques : bar charts / critical path diagrams
3. Output : well-planned schedule

* WBS has Formats :
1. deliverables format [all nodes under parent Represent 100% of Parent scope]
2. Verb-oriented WBS [action-oriented, first word of each node is verb (plan, creat..)]
3. Noun-oriented (deliverable-oriented) [noun of name is component of larger deliverable]
4. Time-phased WBS : Breaks project into phase (for large time scale projects) after big part of first phase is done, planning for 2 begins, uses concept known as "rolling wave"
5. Miscellaneous WBS Formats. (others)

* The 100 percent rule : WBS must 100% represent all work & deliverables
* Rules of thumb for WBS :
1. Outcome Rule : Keep decomposing outcomes untill actions reached, stop!
2. 40-hour Rule : any element that takes less than 40-hour labor not added.
3. 4-percent Rule : any element which represents less than 4% of Time OR Cost is ~~good~~ out!

* WBS numbering : 1.1 (x%) 1.2 this x% represents Time
1.1.1, 1.1.2 | 1.2.1, 1.2.2

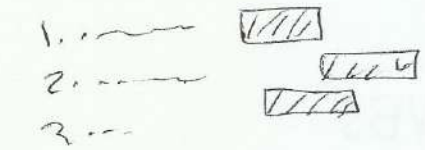
* WBS Dictionary :
- is a doc that contains more detailed info about each element in WBS

* Enterprise Environmental Factors :
- market conditions
- Organizational culture
- governmental Regulation. ...

* Estimating Activity duration in WBS is done by estimating individual work packages.

* work package can be estimated as AVG (worst + Best)

* Activity List : list of all activities within scope of project.
* Activity attributes: details about each activity on activity list.
* Sequencing activities is determining procedence relationships among activities
* Gantt Chart: tool for charting project schedule (Bar charts)
* Critical Path Method Network (CPM)
* slack = TF



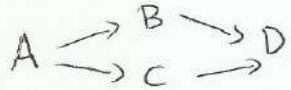
CPM disadvantages:

1. Takes time to become proffessional in it.
2. requires a lot of space.

Activity Predecessor Dur

A –
B ← A
C ← A
D ← B
D ← C

Activity Network Diagram



Pred → Act

TF

E_S	Act	E_F
L_S	Dur	L_F

FF

$E_S(0) = 0$

$E_S(x) = MAX[E_F(X-1)]$

$E_F(x) = E_S(x) + dur$ ⊕

$L_F(Final) = E_F(Final)$

$L_F(x) = MIN[L_S(X+1)]$

$L_S(X) = L_F(x) - dur$ ⊖

$TF = EF - L_F$ ⊖

$FF = MIN[E_S(X+1)] - E_S - dur$

$FF \leq TF$

CRITICAL PATH = where TF = 0, 0, 0 --

TF = ammount of time activity can be delayed without affecting project finish date.

FF = " " " any early start of successors

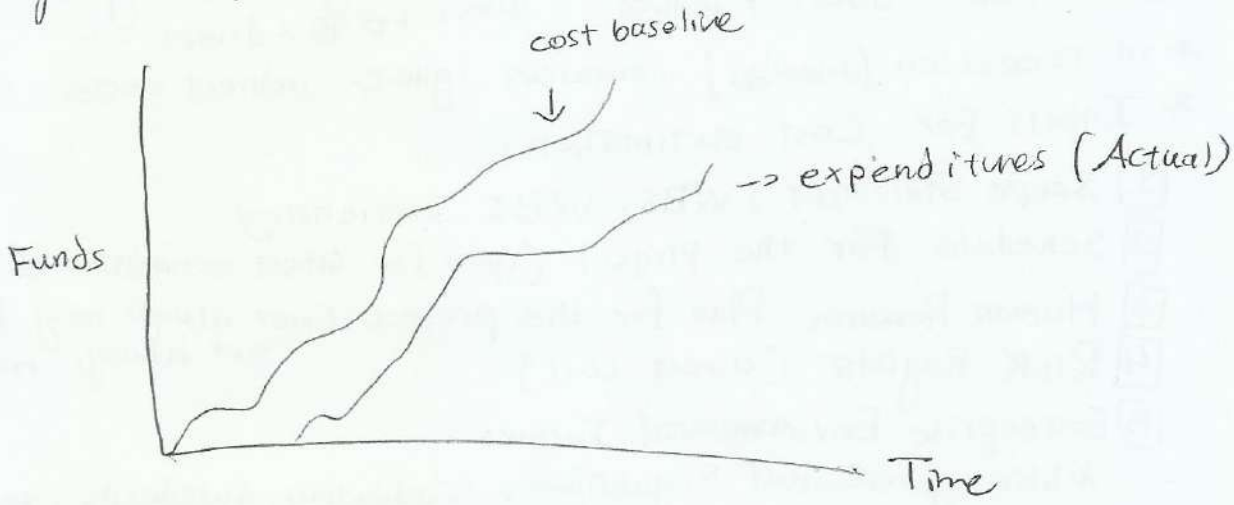
* cost estimate is usually developed in response for Request for proposal (RFP) or Request for quote (RFQ) in that case, cost is estimated before project initiation.
* project contingencies for info lack.
* in large projects, budget is based on complete and better info than cost estimate
* in small project, they are result of same process
* cost estimate is informed decision.
* Direct costs: perssonal, matterial, equipment, facilities, services, intrest inflation allowance, contengcies, RISK.
* Idirect Costs (overhead): utilites, bills company-wide, administrative support Insrance,
* companies accomodate for indirect costs by increasing direct by persentage
  ex: Full = direct + indirect = direct + 0.15 x direct
* in recession (كساد) companies ignore indirect costs.
* Inputs For Cost Estimation:
  1. Scope Statement, WBS, WBS dictionary
  2. Schedule For the project (good for intrest estimation & time-intensive mat)
  3. Human Resource Plan for the project (not always ready for cost estimate but always ready for budget)
  4. Risk Register [direct cost]
  5. Enterprise Environmental Factors
     * like goverminal Regulations, Industry Standards, quality of HR ...
* Estimating Methods:
  1. Expert Judjment [past data] [weakness is crrency]
  2. Analogous Estimating: [past data]
  3. Parametric Estimating: [Past data] [statistical]
  4. Bottom-up Estimating: [sum cost of work-packages]
  5. Three point Estimating: [one of or Avg of Best, worst, predicted]
  6. Reverse Analysis: [add padding to parts or whole]
  7. Vendor Bid Analysis: [look at bidders (qualified ones only) qualified means: states criteria & specefication in RFP or RFQ
  8. Estimating Software:

* cost estimating results in:
  1. cost estimation summary: estimate of each component
  2. cost estimation notes: hes the following:

① how estimate was developed
② explanation of all assumptions estimate based on.
③ all constraints & how they affect estimate
④ room for error considered (% added or subtracted)
⑤ level of confidence in final estimate.

* in small projects budget = cost estimate
* in large budget ≠ cost estimate

* output of budget:
  [I] Budget Summary [includes project management costs]
  [2] Cost Performance Baseline
    * used to monitor actual cost vs cost baseline through the project



\CH6/

* working on Human Resources, communication, Procurement and Quality Plans begins immediatiley following Project initiation.

A Human Resource Plan

* developed early in planning process
* managerr plan organize build lead Project teams

1 Roles & Responsibilities : covers [Includes Project Manager]

(1) Roles : describes positions needed
(2) Authority : range of authority is determined (who can do what)
(3) Responsibility : the work that each member is assigned to do.
(4) Competency : knowledge, skills, capacity required of each member.
* Another type of summarizing responsibility is RACI
* stands for (Responsible, Accountable, Consult, Inform)

2 Organization Chart :

* shows all roles (positions)
* most common form is hierarchial organizatn
* some project manager use matrix format

3 Staffing

* summarizes how and when PM will aquire the HR needed.
(1) Aquizition : where needed staff will come from
will PM need help from HR dep. or procurment dep. in case of contractors?
(2) TimeFrames : what period and how much time is needed from each member.
important when PM negotiates other deps for staff.
(3) Release Method : Summarizes when & how member will be relieved from project.
important for project cost, as long as members in proj, costs are on proj.

4 Training Needs

* Explains what type of training needed for whom and where.

5 Recognition and Rewards

* motivate team member to higher levels of performance.
* what rewards, criteria, who gives it.

6 Compliance

* Saftey, healthy, environmental... usually in goverment contracts.
* list all compliances & how team will meet them.

7 Saftey

* ethical, avoid lawsuits and medical expenses, increase competetiveness

B

B Communication Plan:

* developed to ensure effictive communication among stakeholders though project.
* Answers:
  ① who are the stake holders ? ② what info does each stakholde needs?
  ③ how often he needs that info ④ in what format he needs that info
  ⑤ who is responsiple for providing the needed info to stakeholdes.

C Procurement Plan

* determining what resources needed, Potential suppliers, best supplies
* 3 Types of contracts:
  ① Fixed-Price: most common type, specified price, doesn't vary
    * can have penality built-in
    * Two Types: ① Firm Fixed Price: fixed price unless firm asks for edits
      ② Incentivized fixed price: fixed price but has incentives in case of good work
  ② Cost-Reimbursement Contracts (cost-plus)
    * Supplier bills firm for actual costs plus a fee, good when unknown ultimate cost
  ③ Time-Material (open-ended):
    * used when firm not sure how much time will be required and when materials quantity unknown
    * companies try to avoid this contract & if necessary then define max * hours/material
* Statement of Work
  for materials specify: type, amount, quality, locations
  for Proffessionals: what work, qualifications, hours, when
* Make-or-buy list
  * list of work that will be done internally, called "make decision" or externally, called "buy decision"
* Procurement Document
  standardization protects firm from differently treating supplies
  * Common Documents:
    ① RFP (Request for proposal): proposals requred to specify price method, capabilities (Solicit Proposals)
    ② RFQ (Request For Quota): (solicit quotes)
      quote: less detailed Them Proposal & Typically used when Firm Knows capabilties of supplier & need to know Price.
    ③ ITP (Invitation To Bid): (solicit bids)
  * Selection Criteria:
    - Respsniveness (clarity of the work to be)
    - overall Cost (not just lowest bid) (lowest [goods + operating])
    - Capabilties
    - Risk (acceptance of its share of risk, plan to avoid it)
    - Mangment Process

D Quality Management Plan:

* Firms develop quality policy then develop quality management plans for policies
* quality plan provides specefic details how to apply policy daily
* subset of Firm organization wide quality plan.
* 2-levels:

① macro-level [Quality management] [Big Q]: continual improvment
② micro-level [Quality control] [Little Q]: subset of above. ensures the deliverables of project meets specefication & involves applying (cause & effict, Pareto charts, histogrue)

Components of The Project Quality Plan

1. Quality management approach: how quality of deliverables ensured.
2. Quality Related definitions: Terminology used in quality plan.
3. Quality Objectives for the project: Translate (acording to spec, within...) to specfic terms & numbers (ex: 02/05/2022 complete 50%...
4. Process Quality Measures: lists the measures that will be used to encure process quality.
5. Product Quality Measures: lists the measures that will be used to ensure that all deliverables meet quality specefica... before shipping.
6. Quality Related Responsibilites of Team Members
   lists the broad quality-related responsibilities of the Team & indivisuals.
7. Quality Tools To Be Employed: →→→▷
   Flow charts, control charts, cause & effict diagra...
8. Reporting Procedures
   how process & ~~quality~~ product quality results will be reported, how often & to whom
   Keep process & product logs, which contains:
   ① name of process ② date of review
   ③ findigs of the review (problem)
   ④ how problem was resolved
   ⑤ date of solve.

* Risk identification & prioritization (CH7) are parts of PM's Job.
* Risk management happens simultaneously with scheduling, budgeting, HR plan -----
* Large Firms has risk department or risk professionals, in small firms it is PM
* Risk: Probability that things will not go as planned, and unplanned events occur.

Factors That increases the Level of risk:

1. Duration: the longer it takes to complete a project the more likely something goes wrong
2. Lapse Time: time between contract and beginning work should be minimized.
3. Inexperience: experienced firms are less prone to errors.
4. Insufficent Maturation: aged firms are better at eliminating risks.
5. Unfamiliarity: new sub-contractors are not guaranteed like the known ones.

Definition of Risk Management from PM's Prespective:

Identifing risks that might negatively affect the successful completion of the project, assessing their impact, developing ~~mitigation~~ Mitigation plans and implement the plans in a way that minimizes risks.

What PM should do to minimize risk ?

1. Be aware that risks exists on all projects (dont ignore risks)
2. Identify project-specific risks.
3. Assess the potential consequences of the risks (Best and worse case scenarios)
4. Communicate risks and their potential consequences to stakeholders.
5. Develop and implement risk mitigation (تخفيف) plans (Stratigies to minimize risk)
6. Monitor the effictiveness of risk mitigation stratigies

Risk Classification:

1. External-Unpredictable: arises from third parties, nature, and any uncontrallable.
2. External-Predictable But Uncertain: risks that can be predicted to occur, but not the extent to which they will occur.
3. Internal-Technical: Risks increase when using new technologies due to bugs and lack of experience with these technologies.
4. Internal-Nontechnical: Human & organizational issues.
5. Legal/ethical – Civil & Criminal:

Every PM should develop or participate in the development of RBS (Risk Breakdown Structure).

Risk factors associated with the 5 success criteria:

1. Time Related Risk Factors (tight schedule, material delivery problems)
2. Cost Related Factors (Poor cost estimation, strikes)
3. Specification/Quality Related Factors (Poor planing, rushing work)
4. Environmental-Related Factors (Poor supervision, not knowing environmtal regulations)
5. Saftey/Health-Related (Playing Russian Roulette with employees)

Risk Identification Process:

1 Risk Identification Team.
* in small firms, team is PM and one or two personnel
* in large firms, team is PM, risk managemnt expert and members of Project team.

2 Risk Breakdown Structure Template
* used to trigger the thinking of the risk management team
* members should not be limited to RBS and add categories if needed.

3 Risk Identification Methods:
① Review of Project Documents (expose errors like deadline is too soon)
② Brainstorming Sessions (good for finding project-specific risks
③ SWOT analysis (Strengths, weaknesses, opportunities, threats)
* looks at both positive and negative risks, some time there are Positives that helps solving the negatives.

④ Experience Review
* use experience from dealing with similar projects in the past.
* done before Reviewing documant & SWOT

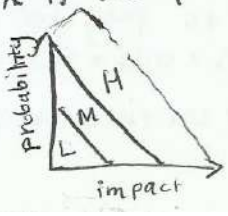
⑤ Review of Professional litreature
* done before Reviewing docs & SWOT.

⑥ Survey of Experts/Delphi technique
* done before Reveiwng docs & SWOT

⑦ Expert Judgment
* important when reviewing documents.
* experts here are the risk identification team membars.

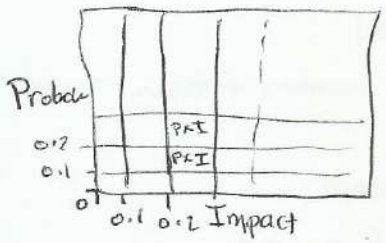
4 Process Output
* the output of the risk mangment process is list of potential risks organized under bread categories specefied in RBS along with new categories added to RBS.
* each entry in the list is in standard format that informs the response to risk.
* Best way to write the list is cause-and-effict format, which is just (if-then) statements, this format makes it easier to develop risk response strategies.

Qualitative Risk Analysis
* this is the next step after risk identification is done.
* Qualitative Risk Analysis assesses the probability that a given risk factor will have an impact the project and the extent of the impact.
* Quantitative Risk Analysis assesses the probability that a given ~~risk factor~~ loss will occur and the magnitude of the loss.
* Qualitative is widely used (more than Quantitave).
* Qualititative is completed before risk responses.
* if we plot probability [0-1] and impact [0-1], we get 3 levels of risk.



Low risk
Moderate risk
High risk.

*another way is matrix format:



entries are Risk Value = Probability x Impact

0 — 0.19 low
0.20 — 0.39 moderate
0.40-plus High

Risk Response Strategies

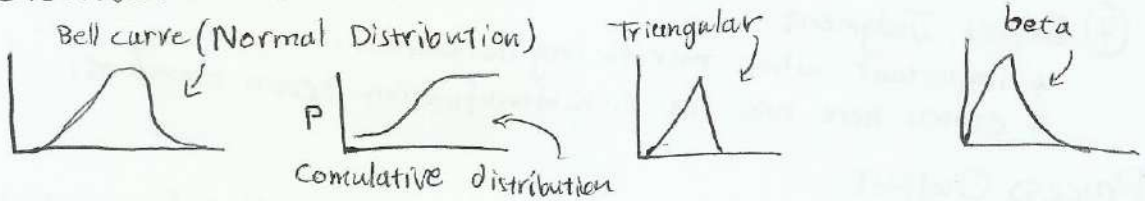
1. Elimination: completely remove risk by solving the issue.
2. Transfer: Pay 3rd party to stop worrying about the risk (ex: buy insurance)
3. Minimization: two aspects:
   (1) minimize the the chance of that risk. (2) minimize the damage of that risk.

Quantitative Risk Analysis

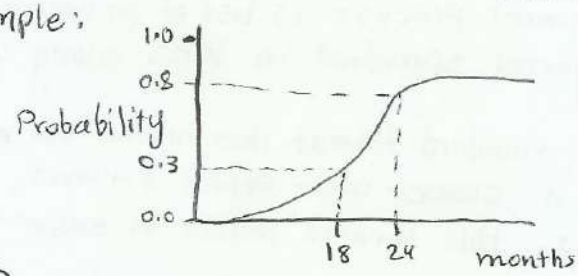
* Complex, needs experts, used to address the following questions:
  (1) How long the poject will take to complete (will it pass deadline?)
  (2) How much will it cost to complete on time (will it pass budget)
  (3) will the team be able to meet all specifications (will it meet quality standards)

Quantitative Analysis Tools

1 Distribution Tools & Curves



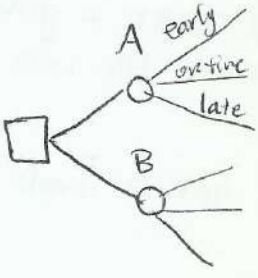
example:



Probability to finish in 24 months is 80% while finishing in 18 month, has 30% chance.

2 Decision Trees

* used to analyze cost options, example:
  assume 2 suppliers A, B. we ask them to give us 3 prices:
  (1) Base Price: on time delivery (2) incentive price: early delivey (3) Penality Price



200 $	.2
150 $	.5
100 $	.3
225 $	.3
150 $	.5
90 $	.2

* Team decides whether to optimize for time or cost.

* probability of each scenario is given.
* Probability that supplier A delivs on time or earlier = 0.7
* Expected price to pay for A:
  200 x 0.2 + 150 x 0.5 + 100 x 0.3 = 145 $
* Expected price to pay for B:
  225 x 0.3 + 150 x 0.5 + 90 x 0.2 = 160 $
* Probability of B on time or earlier = 0.8

CH8

* Team: group of people working together to accomplish a mission.
* Team building is constantly worked-on through the whole project & ends with the end of the whole project, Teambuilding is PM's responsibility.
* PM can't always pick team members as most of the employees commited to another Projects
* "Mission Statement" is used to keep reminding the team of their purpose.
* Mission Statement contains the name of the project & brief description and the following statement; "our mission is finish on time budget specs"
* some firms add saftey and enviroment to the statement.

Responsibilities of Project Managers:

1. Serve as the connection between team & higher management
2. Serve as a leader to the project team (ultimate responsibility)
3. Serve as official record keeper of the team.
4. Participate in team disscussions, avoid dominating.
5. Implement team recommendations within manager's authority.
6. Prevent & resolve counter-productive conflicts.

How To Develop Positive Working Relationships in Teams?

1. Help team members understand the importance of being honest & reliable
2. Help them develop attitude of mutual support
3. Help them develp supportive attitude (we are in this together)
4. Help them understand that they need to share stress involved in quality, time, budget goals.

PM needs to explain the roles of team members as follows:

1. Their Primary Role in the Team.
2. Their Supporting Roles.
3. Their Range of Authority.

* why these points?

(1) solve conflict when member thinks others croaching on his territory.
(2) also when member thinks others are reluctant to providing help.

The Four-Step Model For Building Teams:

1 Assessing Project Team's Strengths & Weaknesses

* The following factors are must for effictive & productive team:
  (1) clear direction understood by all members (mission, goal ....)
  (2) Team players on the team (Team comes first, me second)
  (3) Accountability measures understood by all members
* Conducting a Team Assessment:
  - done by using nuemerical scale, like:
    completly true (CT) = 6 Somewha False (SF) = 2
    Somewhat True (ST) = 4 Completly False (CF) = 0
  - then by answering questions like "all members support each other"
  - any score less than 4 is weakness in the team.
  - any score above 4 is strength in the team.

2 Developing Team-Building Plan

* The results from Assessment are used to plan how to correct weaknesses and exploit strengths.

3 Executing TeamBuilding Activities

* can be done indivisually, like when members don't trust mazen, then you pull mazen aside for a little chat.
* or in groups like the first meeting.

4 Evaluate Team building Activities.

* Compare current behaviour with original assessment.

Initiating the Team's Work.

* hold "team initiation" meeting before begginning work.
* different than "Kickoff" or "project initiation" meetings.
* not recommended to combine the two meetings.
* meeting contains:
  (1) discussing team's mission (2) confirm members commitement
  (3) inform members to be team players (4) Review Accountability

Coaching = leading ≠ Bossing

Team charter is a document consisting of:

(1) mission statement for the team.
(2) ground rules for team members
(3) team goals/milestones [From project schedule]

Ground Rules are things like "honesty, no personal agendas..."

* can consult team or just show them a list.

Strategies helps PM to gain respect, and for team to respect eachother

(1) Trust made tangible (2) Appreciation of people as assets
(3) Candid & clear Communication (4) Unequivocal ethical Standards

Strategies for handling human diversity:

(1) Identify the different needs of different ~~people~~ groups.
(2) Confront Cultrular Clashes directly & immediately
(3) Identify & Eliminate Institutionalized Bias
  * instutionalized bias: unintended or intended (usually unintended) bias caused by the changing of society but not the changing of firm (example: few female restrooms vs male because when firm established no females were working)
(4) Help People find common ground.

* conflict can occur even if the members agrees to the goal, they may disagree on how to accomplish it.

Strategies to Prevent Conflict:

1. clarify assignments
2. clarify roles
3. Encourage team members to talk through their differences
4. Tech members how to disagree without being disagreeable
5. Handle Conflict promptly

Types of Human Response to Conflict in Teams

1. Escape Responses

* negative because they hurt the team & the person who does the escaping,
* Includes: Denial, Flight & Suicide.

2. Attack Responses

* negative because they hurt the team, the Victims, and the attacker.
* Includes: Litigation/Formal grievances (Lawsuits), assault, and murder.
* Team members response to such attack is:
  1. Take Sides: conflict spreads and become worse
  2. Defence mode: they focus on conflict & not project.

3. Resolution Responses:

* positive, they lead to a resolution good for all stakeholders
* Responses listed in order of preference: overlook, reconcile, negotiate, mediate, arbitrate.

1* overlook: both sides agree to ignore it and go on.
2* reconcilation: forgive-and-forget, like shaking hands and apologize.
3* negotiate: not everyone gets everything they want each gets some, but agree to shake hands.
4* mediate: PM works as referee.
5* arbitrate: PM gives a decision and all must agree, this the final solution.

* Monitoring and controlling comes after planning, and it is Simultaneous with execution. CH10 | 10

* Monitoring and controlling of a project involves observing and measuring then applying appropite adjustments based on observations.

* PM and team members monitor the following elements:

1 Monitoring Scope

* one of the challenges PM faces is scope creep.
* Scope creep : changes to the project that exceeds it's scope after the contract is signed.
* a proper change-order process prevents scope creep by adjusting budget and schedule accordingly.
* PM and his team do the following steps to monitor scope:

① Ensure Acceptance of Deliverables (Signing off on deliverables)
* influenced by "Acceptance Criteria" developed in planning phase.
* after signing-off, the firm is no longer responsible for shipping the product.

② Manage the Change-Order Process
* without chang-order it is impossible to meet the 3 basic criteria.
* Change-order : document out-of-scope requests so customer is billed.
* also used to document rework done due to poor specification from customer.
* not all change-orders are extra expenses, some are decreasing cost.

③ Update Project Documents
* project close-out is invalid if documents are not updated with changes.

2 Monitoring Schedule

* if project falls behind schedule, PM has 4 options:

① Increase Staff (affects HR plan and budget)

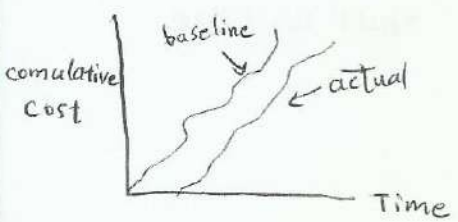
② Approve Overtime (affects budget)

③ Subcontract Some of the Work (affects budget)

④ Miss an Activity Deadline
* if activity is on critical path, it is hard to miss it.
* Sometimes it is possible to delay activity but not whole project.

3 Monitoring Costs

* PM monitors predicted costs vs actual using cost baseline graph.



* PM does what is necessary to influence team to stay within budget & don't monitor only.
* PM don't just make budget adjustements, these adjustements needs to be examined & approved
* one of the common budget adjustements is "Performance Value"

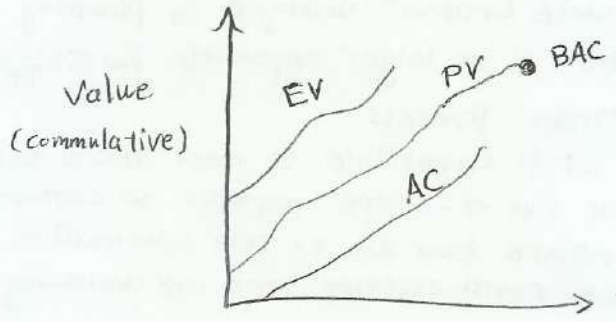
* Performance Value is the value of the work being Performed on a project.

* if work falls behind schedule due to anomaly, don't adjust historical data.

Cost Monitoring & Control Methods

1 Earned Value Management (EVM)

* EVM integrate the most important 3 factors (scope, cost, schedule)
* EVM has 3 dimensions:
  1. planned value (PV) aka Performance Measurement Baseline (PMB)
     * The amount of money in the budget planned for activity.
     * Total PV for a project is called BAC (Budget at Completion)
  2. Eearned value (EV)
     * The percent of completion of project work at any point.
  3. Actual Cost (AC)
     * is what work is actually costing,
     * if PV covers direct costs then AC does and if PV covers indirect then AC does as well.



* we always want EV above PV, and AC below PV.

* Beside graphing, we have numerical formulas:
* Schedule Performance Index (SPI) $SPI = \frac{EV}{PV}$
* SPI less than 1.0 means work is behind schedule.
* Cost Performance Index (CPI) $CPI = \frac{EV}{AC}$
* CPI represents "cost variance"
* CPI less than 1.0 means costs are over budget

2 Forecasting

* used when we know that actual costs will exceed predicted.
* EAC (estimate at completion), ETC = Estimate to Complete
* EAC = AC + ETC
* Developing EAC in an expense of itself.

3 To-Complete Performance Index (TCPI)

* is an estimate of the cost performance that will be necessary to achieve BAC or EAC

for BAC: $TCPI = \frac{BAC - EV}{BAC - AC}$

for EAC: $TCTI = \frac{BAC - EV}{EAC - AC}$

4 Performance Reviews :

① Variance Analysis : compares planned cost/schedule to actual.

② Trend Analysis : determines if performance is improving, static or declining by ploting actual perfumce Vs planned.

5 Cost Monitoring & Control Software

4 Quality Monitoring

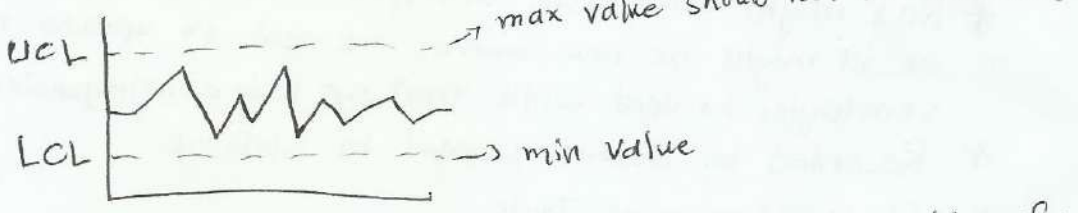
1 Big Q Monitoring & Control : Quality Audits

* Ensuring that the appropriate process & product quality measure are being used and that quality performance reports are being made. Big Q is sort of the big Picture of quality control.
* we learn from it for the future (lessons-learned at closeout)

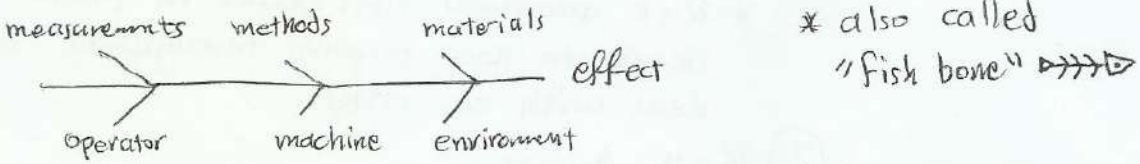
2 Little Q Monitoring & Control : Quality Control

* day-to-day application of quality tools.
* list of the available tools :

① Control charts : Identifies fluctuations that cause performence to go out of acceptable limits, example :

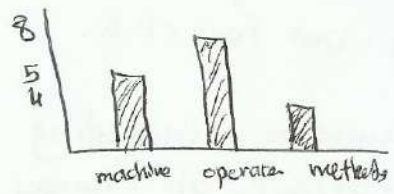


② cause-And-Effect Diagram : used to identify root cause of a quality problem, example :

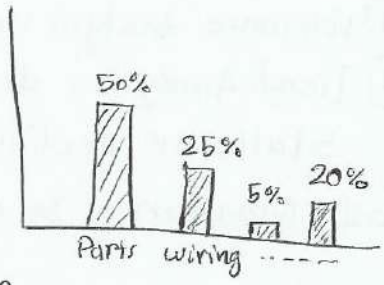


* also called "fish bone"

③ Histograms : bar chart presented in vertical format that shows how often a given variable occurs, example :

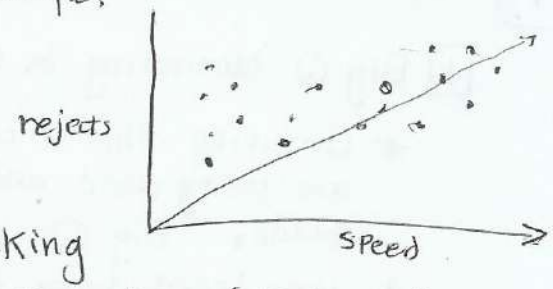


④ Pareto charts : special type of histograms that shows Pecenteges , example :



⑤ Scatter Diagrams : used to graphically display the relationship between 2 factors , helps finding how changing a variable would affect the other , example :

in this example, the faster the machine the higher rejects



⑥ Statistical Sampling : picking a random sample of smaller percentage (10%, 5%) do represents the larger set , if production line has produced 1000 products, the testing randomly picked 100 products is enough to represent the whole 1000 products.

⑦ Inspections : do them throughout the whole project.

5 Monitoring Risk

* Risk might come from anticipated sources (covered in CH7) or it might be new source, we need to update response strategies to deal with that or using contingencies built-in.
* Recorded in lessons-learned in closeout.
* Risk Monitoring Tools :

① Ongoing Risk Assessment :
* Risk assessment first occurs in planning phase, but it needs to keep ongoing throughout the project to deal with new risks.

② Risk Audits
* Audits Aim to measure the effectiveness of the risk responses.

③ Variance & Trend Analysis
* Same as EVA but for risk.

* note that all risk documents - including risk register - should be updated to reflect all changes / revisions.