Project Management: Process, Technology, and Practice

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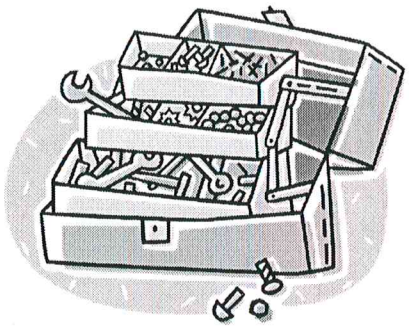
Chapter 3
Project Management Tools

أدوات إدارة المشاريع

Project Management Tools

Tools



Project Management Tools

Learning objectives

- Describe various tools that are available for project managers
- Explain how to brainstorm with your project team and come up with decisions
- Explain how to use a Thought Process Map with a project team to represent the entire team's thoughts, ideas, and questions relative to accomplishing the project goal
- Explain how to use Quality Functional Deployment and understand customer requirements for scope development
- Understand how to satisfy customers using the Kano Model

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Learning objectives

- Discuss how to find the cause and the effects of problems using fishbone diagrams
- Explain how to use the Delphi technique in projects
- Implement SWOT analysis and burndown charts
- Understand various collaboration tools and project management software

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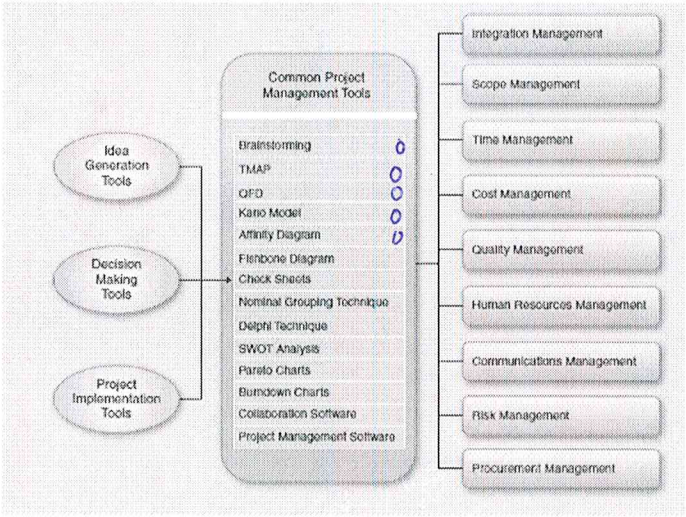

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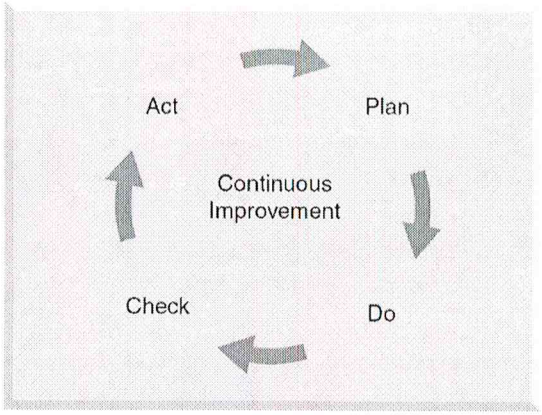
PM Tools



Project process improvements contribute to the success of projects.

Project Management Tools

Tools

1. Brainstorming
2. Thought Process Map (TMAP)
3. Quality Functional Deployment (QFD)
4. Kano model
5. Delphi Technique
6. SWOT analysis
7. Communication and Collaboration Tools

Project Management Tools

Brainstorming 1

- Teams often meet to generate ideas on any topic.
- Brainstorming
  - Establishes an efficient process that is free of criticism and judgment.
  - Encourages open thinking among team members and involves all team members in the process.
  - Works well if team members build on each other's creativity focusing on a single topic.
  - Collects team knowledge.
- As a structured process
  - Team members provide ideas in turn.

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1 – **Brainstorming**

- As an unstructured process
  - Team members provide ideas at random.
- Individual team members paraphrase their ideas, clarify, and record them on a flipchart or board.

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1 – **Brainstorming**

- Ring-Exchange Technique, originally named Method 635
  - Six members sit around a table.
  - Team members generate three ideas and put them at the top of three columns on a sheet.
  - On command, the sheets are passed to the neighbor who tries to further develop the ideas.
  - New ideas are built on previous ideas in the same column.
  - Sheets are passed around five times and the time allotted for each round is limited to approximately five minutes.

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2 TMAP Thought Process Map.

- A graphical representation of a series of ideas or thoughts or decisions of a person or a team
- An initial process for accomplishment of the project goals
- A visual representation of an entire team's thoughts, ideas and questions relative to accomplishing the project goal
- Should be one of the first tools employed when starting any project
- Presents a structure of information and helps a team progress through the project process
- A living document that will change throughout the project and has no set format

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2 TMAP

- A TMAP can be used to drive specific actions and select tools that are needed to complement those actions.
- It also allows the team members to refer back to how, why, and when decisions were made.

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TMAP

- Define the project goal(s)
- List the knowns, unknowns, and constraints
- Ask DMAIC questions and "grouped" questions
- Sequence and link all team comments, responses, and questions
- Improve and link all responses to form a thought map
- Identify possible tools to be used

Project Management Tools

TMAP

- Define the project goal(s)

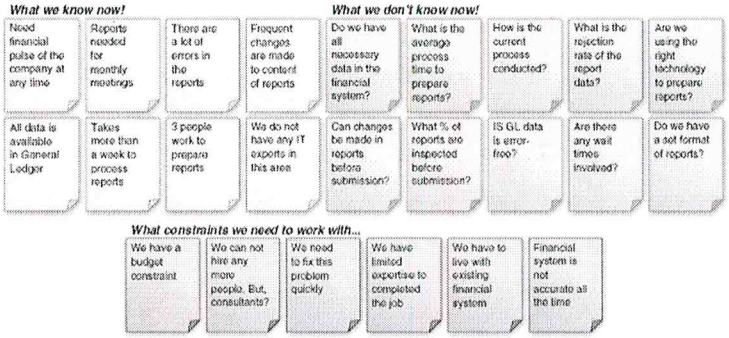
Problem Statement:
"Financial reports are late every month"

Project Management Tools

2 TMAP

- List the knowns, unknowns, and Constraints

Problem Statement: Financial reports are late every month.



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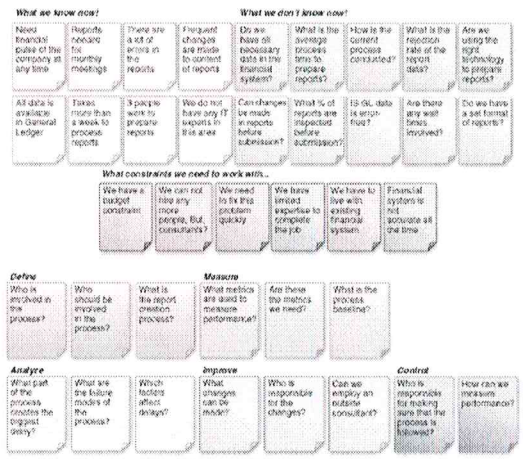
2 TMAP

- Ask DMAIC questions and "grouped" questions

DMAIC

Define



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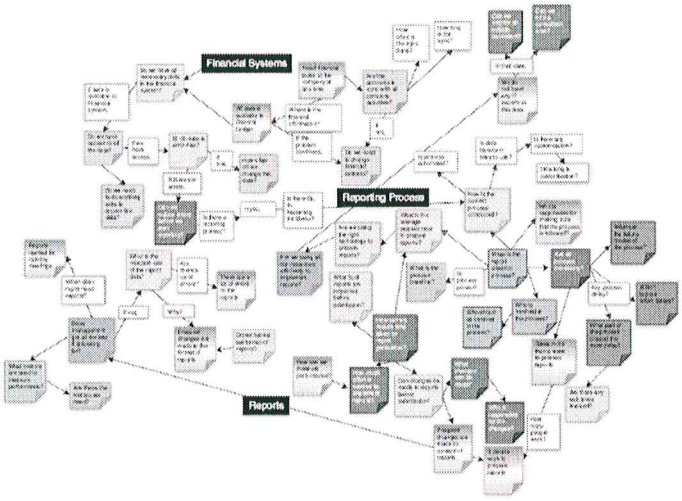
TMAP

- Sequence and link all team comments, responses, and questions
- Improve and link all responses to form a thought map



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TMAP

- Identify possible tools to be used

Questions		Responsible Person	Completion Date
What metrics are used to measure performance?	Gather data on how late reports get ready	XXX	MM/DD/YYYY
Do we have all necessary data in the financial system?	Check all data in monthly financials	XXX	MM/DD/YYYY
Are the accounts in sync with all company activities?	Check General Ledger for errors	XXX	MM/DD/YYYY

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3 Quality Functional Deployment QFD

- House of quality
- A fundamental foundation in understanding customer requirements; links customer requirements to project planning, analysis, design, and implementation
- Consists of six major components:
  - Customer requirements
  - Technical requirements
  - Planning matrix
  - Inter relationships
  - Technical correlations
  - Technical priorities, benchmarks, and targets

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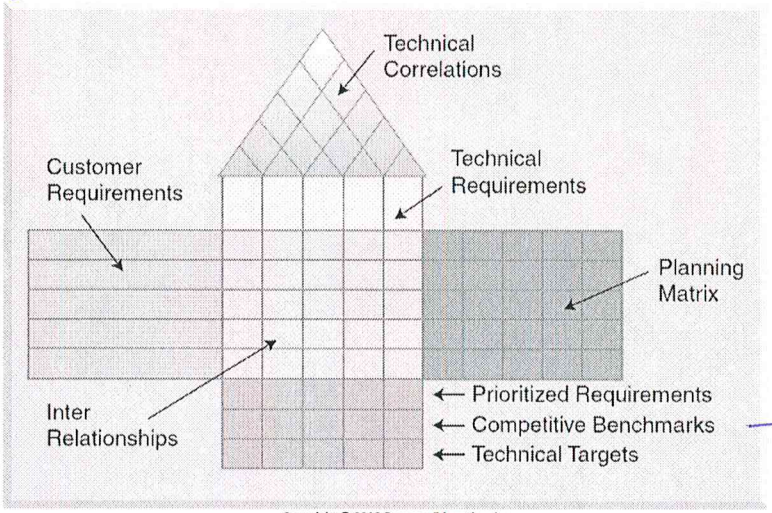
3 QFD



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3 QFD

- Determine, clarify, and specify customer needs in customer requirements component
- Identify what customers want and how to satisfy these wants in technical requirements component
- Complete planning matrix
- Establish a connection between customer requirements and performance measures in interrelationships component
- Complete technical correlations on the roof of the house of quality
- Complete technical properties, set design targets and benchmarks

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3 QFD

QUICK OIL CHANGE

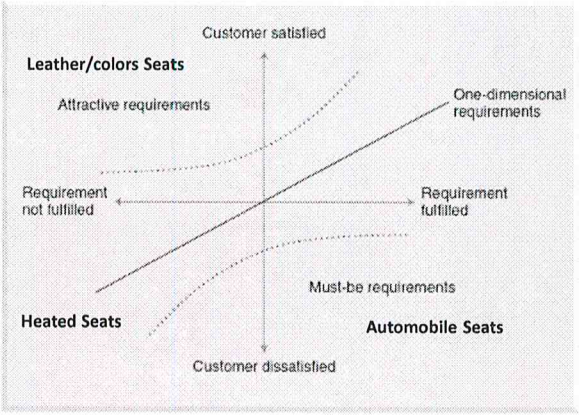
Legend:
- Strong
- Medium
- Weak
- Support
- Conflict

Customer Requirements	Customer Importance	Number of Bays	Meet safety standards	Number of Technicians	Meet Car Manufacturer Standards	Inventory	Automation of Support	Our Product	Competitor A Product	Competitor B Product	Planned Rating	Improvement Factor	Sales Point	Overall Weighting	Percentage of Total
Convenience	Easy to drive in	4	○	○				1	3	3	3	1.40	1.0	7.00	16%
Service	Clean comfortable area	4	○	○				3	3	3	3	1.00	1.2	4.80	9%
Service	Courteous service	2						2	1	2	2	1.00	1.2	2.40	6%
Convenience	Quick service	2	○	○	○		○	2	3	2	2	1.00	1.2	2.40	6%
Value	Shows all work done for approval	3				○		3	3	3	3	1.00	1.5	4.50	10%
Value	Economical	1	▲				○	○	1	1	4	1.00	1.3	1.65	3%
Value	Easy pay options	3						○	3	3	3	1.00	1.5	3.00	7%
Convenience	Reminder tags	3				○		○	3	3	2	1.00	1.0	2.00	7%
Value	Free car wash	3							3	3	3	1.00	1.0	3.00	7%
Value	Discounts for multiple services	3				○	○	○	1	1	1	1.00	1.1	1.10	3%
Service	No bugging to engage in other services	4							1	3	3	1.00	1.0	4.80	11%
Convenience	Easy drive out	5	○	○					1	3	3	1.00	1.0	7.00	16%
	Technical Positives		194.6	180.8	110.7	94.8	93.3	117.9	730.9				Total	43.70	
	Percentage of Total		26%	25%	15%	13%	13%	16%							
	Technical Benchmarking Our Product		3	Yes	5	Yes	$ 135,000	75%							
	Technical Benchmarking Comp A		3	Yes	4	Yes	$ 135,000	69%							
	Technical Benchmarking Comp B		3	Yes	6	Yes	$ 210,000	29%							
	Decision Targets		4	Yes	6	Yes	$ 160,000	85%							

Project Management Tools

4. Kano Model

- Distinguishes between three types of product requirements which influence customer satisfaction:
  - must-be requirements
  - one-dimensional requirements
  - attractive requirements



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4. Kano Model

- ***Must-be requirements:*** The customer will be extremely dissatisfied if these requirements are not fulfilled. Fulfillment of these requirements will not increase customer satisfaction as customers can take these requirements for granted.
  - Example: Brakes in an automobile.
- ***One-dimensional requirements:*** Customer satisfaction is proportional to the level of fulfillment — the higher the level of fulfillment, the higher the customer satisfaction and vice versa. These requirements are usually explicitly demanded by the customer.
  - Example : Better fuel economy in an automobile.

Project Management Tools

4. Kano Model

- ***Attractive requirements:*** These requirements have the greatest influence on customer satisfaction. They are neither explicitly expressed nor expected by a customer. If fulfilled, customers are very satisfied. There is no feeling of dissatisfaction if they are not met. These are of exciting quality to customers.
  - Example: Selection of attractive seat colors, real leather seats, bigger trunk space, power, and more storage space
- ***Indifferent requirements:*** These requirements result in neither satisfaction nor dissatisfaction regardless of whether they are fulfilled or not. Customers just do not care.
  - Example: Various mechanical mechanisms to adjust the rear seat.

هذه المتطلبات لها تأثير قوي على رضا العميل
وهي متطلبات اختيارية تعود بالربح لكي يسعد العميل

متطلبات لا يهتم بها العميل أي اهتمام

مثل اختيار طرق ميكانيكية مختلفة لتعديل الكرسي الخلفي

Project Management Tools

4. Kano Model

- ***Reverse requirements:*** These requirements result in dissatisfaction when fulfilled and satisfaction when not fulfilled.
  - Example: Sinking feeling in some car seats.

- In projects, Kano model can be employed to identify customer needs and functional requirements as well as during concept development.

هذه المتطلبات تغضب العميل مثل الإحساس بالغرق في كرسي السيارة.

Project Management Tools

5 Delphi Technique (DT)

- This is a widely used tool to achieve aggregate opinions concerning real-world knowledge solicited from experts within certain topic areas.
- Procedure:
  - Round 1: An open-ended questionnaire soliciting information about a specific content or problem or issue is designed. The questionnaire is sent to all those who have been identified as respondents, the DT participants. After receiving the responses, the collected information is used to design a well-structured questionnaire. This questionnaire is used as the survey instrument for the second round of data collection.

Project Management Tools

5 Delphi Technique

- Round 2:
  - Based on the responses from the first round questionnaire, a summary of all results is collated by the project manager and a second questionnaire is designed. Each DT participant receives the second questionnaire and is asked to review and respond. The DT participants are also asked to rate or rank items to establish preliminary priorities among them. They are also asked to state the rationale concerning rating priorities among items. Using the results of round 2, areas of disagreement and agreement are identified. Usually in this round, consensus begins to form and the actual outcomes can be discovered among the responses.

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5 Delphi Technique

- Round 3: The results from second round are sent to the DT participants in the third round. Each DT participant receives a questionnaire that includes the items and ratings summarized by the investigators in the previous round. The DT participants are asked to revise their judgments or to specify the reasons for remaining outside the consensus. The third round provides an opportunity for the DT participants to make further clarifications in their responses. Prior research has concluded that a slight increase in the degree of consensus can be expected at the end of this round as the participants have the last chance to revise their judgments.

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5 Delphi Technique

- Round 4: The list of remaining items, their ratings, minority opinions, and items achieving consensus are distributed to the DT participants. This round provides a final opportunity for all participants to revise their judgments and provide any other feedback on the problem or issue at hand.

Project Management Tools

6 SWOT تحليل نقاط القوة والضعف

- A strategic method for identifying whether to use a component or a feature in a project
- Commonly used tool for identifying gaps and potential for improvements in projects
- Internal strengths and weaknesses of a project عوامل الضعف والقوة
- External environmental opportunities and threats facing that project

العوامل الخارجية التي تهدد أو تدعم نجاح المشروع

Project Management Tools

6 SWOT

- Procedure:
  - *Establish objectives:* The objectives of the project issue need to be clearly expressed. The purpose of conducting a SWOT analysis must be discussed at first with the team and a consensus to a clear topic must be attained. The scope of the topic may be wide, narrow, general, or specific. The project manager needs to establish that the final outcome of the SWOT analysis would emerge from contribution and discussion and not from personal views, no matter how much expertise the participants possess individually.

Project Management Tools

6 SWOT

- Procedure:
  - *Delegate research and information-gathering task:* The project manager has to ask each participant in the SWOT analysis team to prepare all background information. This preparation is an important part of an effective SWOT analysis. The background preparation is gathering information on strengths and weaknesses of the project issue and should focus on the internal factors of skills, resources, assets, or lack of them. Opportunities and threats should focus on external factors over which the participants have little or no control, for example, social or economic factors.

ثم توزيع أعباء عمليات جمع ودراسة المعلومات -

عملية جمع المعلومات عن المنظمة الموجودة هي مرحلة هامة في SWOT يتم تجميع كل نقاط القوة والضعف يتم التركيز على العوامل الداخلية مثل المهارات والموارد والممتلكات أو نقصها

Project Management Tools

6 SWOT

تحليل SWOT

- *SWOT analysis:* The project manager should call for a SWOT analysis meeting to discuss the findings of all participants.
- Procedure:
  - *List SWOT factors:* List all the internal strengths and weaknesses of the project and the environmental opportunities and threats facing the project.
  - *Evaluate SWOT factors against established objectives:* Sort and group the listed SWOT factors in relation to the already established objectives. Use those SWOT factors to come up with new strategies, priorities, schedules, project selection, project organizational structure, and outsourcing of projects.

ثم يتحديد نقاط القوة والضعف داخل المنظمة - والتهديدات الخارجية

ثم ترتيب عوامل SWOT وربطها تلك العوامل بالأهداف المرغوبة وبعد ثم يأخذ قرارات مثل إعادة ترتيب الأولويات - أو عملية تنفيذ أو outsource

Project Management Tools

Collaboration Tools

- ***Lotus Domino***
  http://www.youtube.com/watch?v=kmgRnk5VSO0
- ***Office Groove***
  http://office.microsoft.com/assistance/asstvid.aspx?assetid=XT100627131033&vwidth=700&vheight=530&type=flash
- ***MS Project***
  http://www.microsoft.com/project/en-us/demos.aspx

Project Management Tools

Project Tools

Table 3.3 Tool Selection

	Generating ideas	Making Decisions	Project Implementation
Brainstorming	○		
TMAP	○	○	
QFD	○	○	
Kano Model	○	○	
Affinity diagram	○	○	
Fishbone diagram	○	○	
Check sheets	○	○	
Nominal Grouping Technique	○	○	
Delphi technique	○	○	
Pareto Charts		○	
SWOT analysis	○	○	
Burndown charts			○
Collaboration Software			○
Project Management Software			○

Project Management Tools

Summary

- Brainstorming collects team knowledge and encourages open thinking among team members. This tool is used extensively in project management to involve all members and obtain input from all team members.
- A Thought Process Map is a graphical representation of a series of ideas or thoughts or decisions of a person or a team to accomplish a project goal. It is the first tool to be employed when starting any project. This collaborative team effort is used to encapsulate all factors affecting a project. It is typically represented by information in a structured visual format that can be referred to throughout the project by the project team.

Project Management Tools