Project management 101 *by Zavanak*

21. DEALING WITH PROBLEMS

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21.3 Devising a solution

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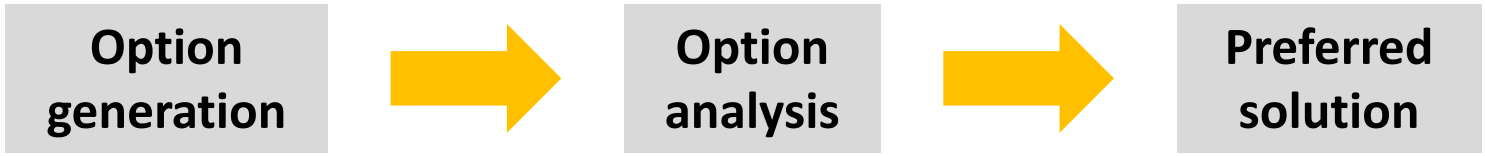
Solution design techniques

What if?



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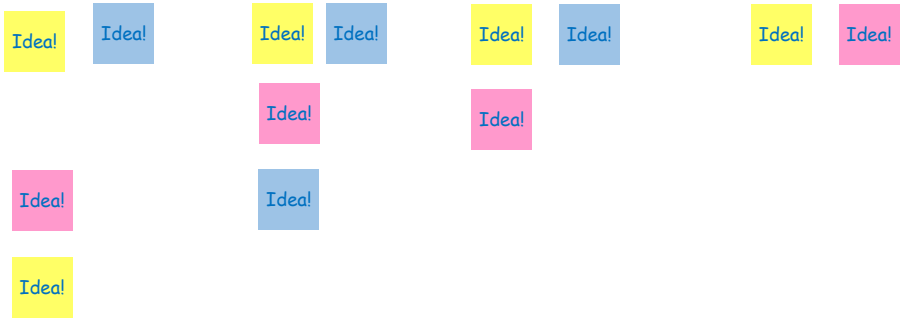
Rapid idea generation

Brainstorming



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Rapid idea generation

Traditional **brainstorming** favours extroverts

This approach gives others time to come up with ideas in a way that suits them better

Beforehand

- Advise participants of the session.
- **introduce the problem and explain the rules.**
- The day before, repeat the problem and ask them to come to the session with a target number of ideas.

On the day

- Have a quick warm up (such as asking the group to come up with 10 uses for an egg cup).

- **Pose the problem again and write it on a wall board or similar display.**
- Invite people to post ideas on a wall.
- **Then start a spontaneous idea generation session.**
- Stop when energy sags and ideas dry up.
- **Have a break.**
- Analyse the ideas as a group.
- **Agree a short list for further evaluation.**

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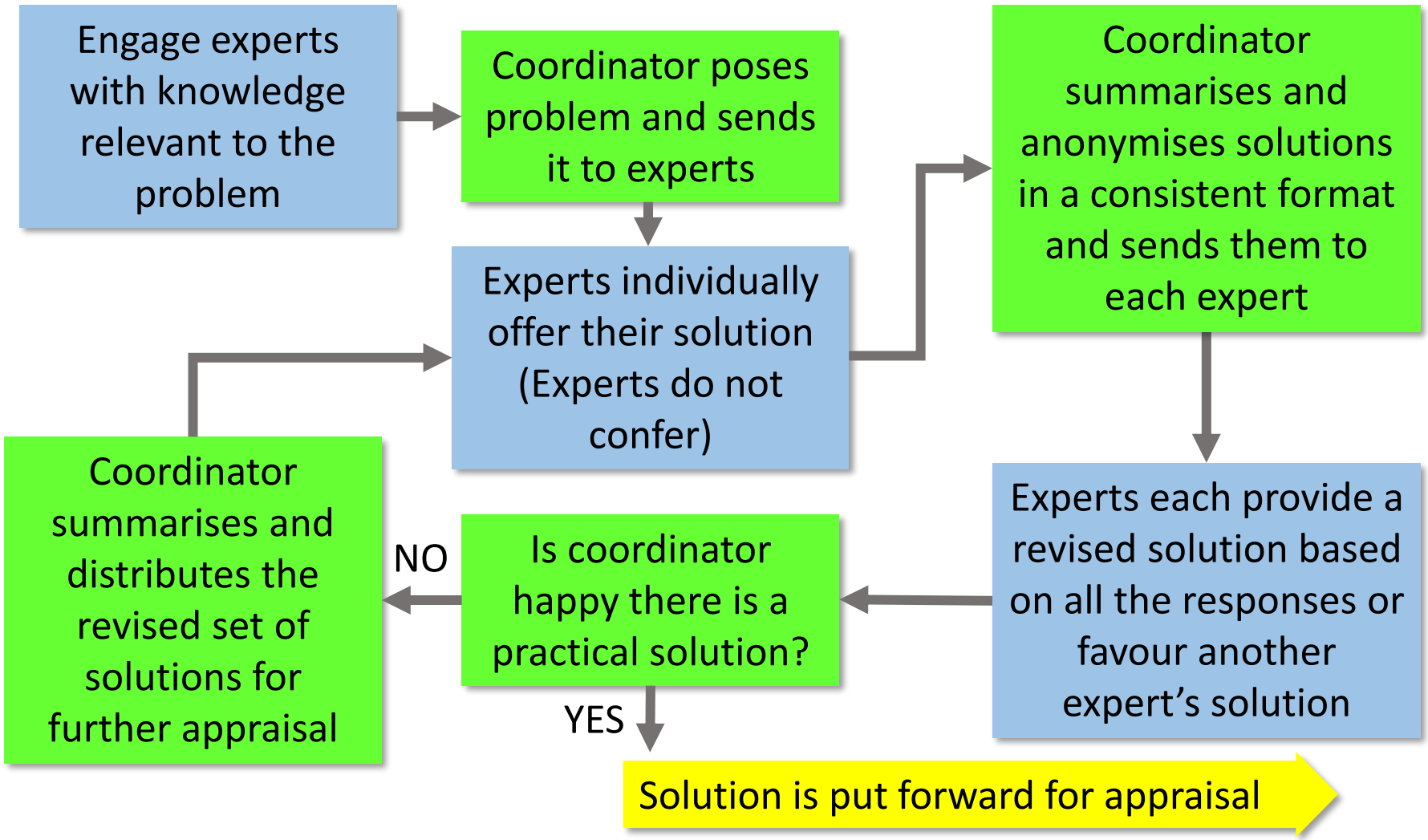
Delphi technique



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Experts

Expert person

Someone with relevant and credible knowledge in the field of interest

Expert system

A computer repository of accumulated experience

Helps identify what has worked in the past and what has not

Artificial Intelligence can construct potential solutions

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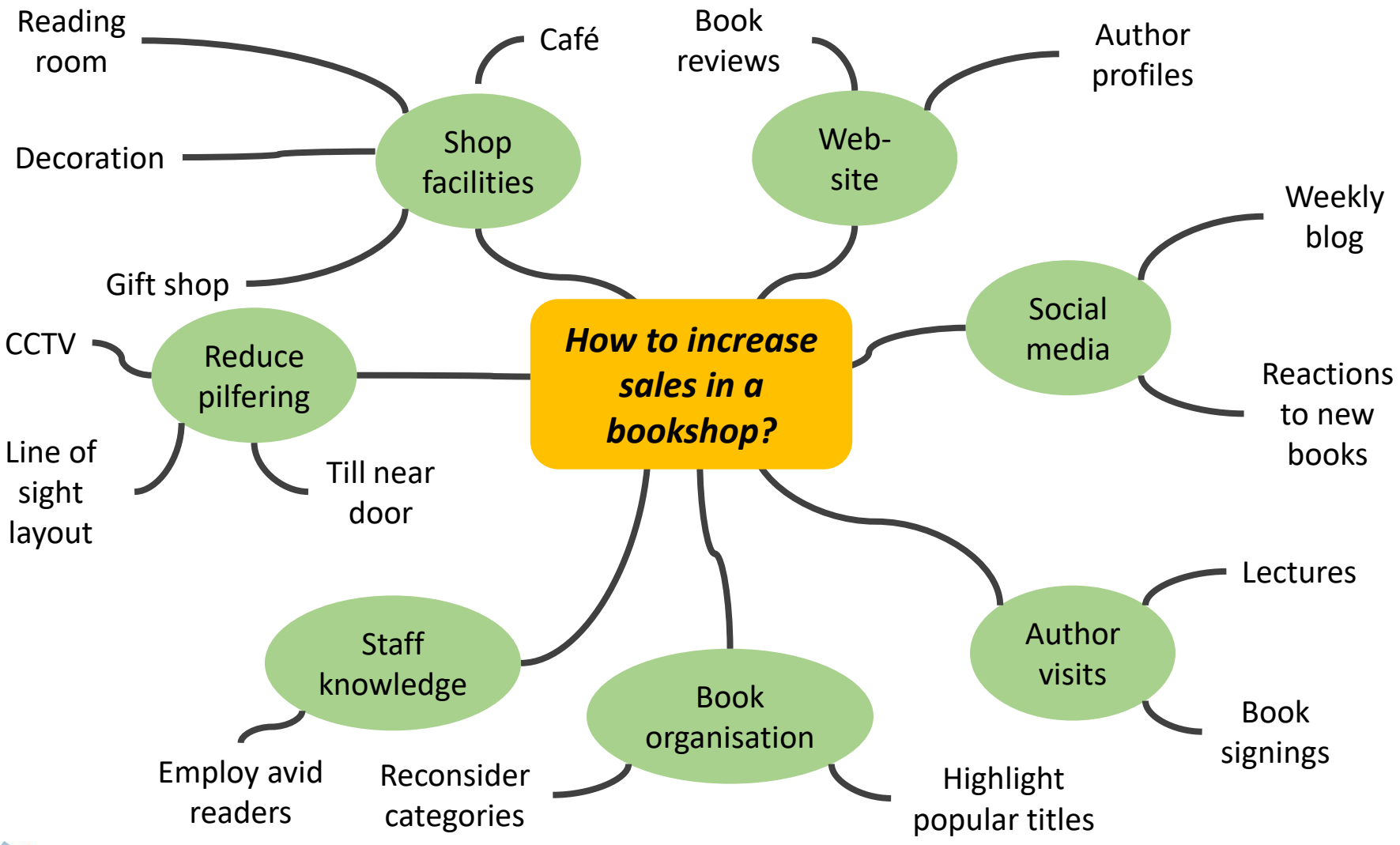
Mind mapping



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Role play

Assume personalities – Different people in a group assume a personality role to explore a problem. Roles could be facts-driven, emotions-driven, negative stance, positive stance, tried and tested approach, innovative approach.

Facts Caution Feelings Possibilities

Take the customer journey – Walk through the process in the guise of different types of customer (or employee, or service user, etc.). Process may be physical, virtual or a combination.

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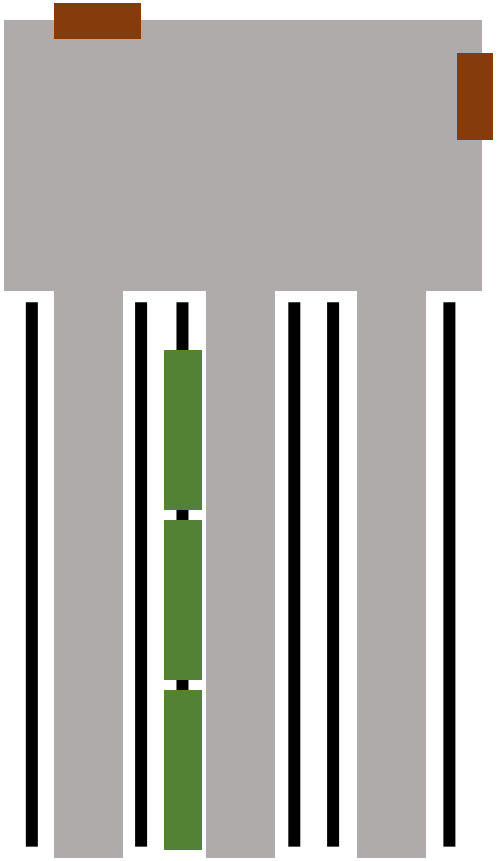
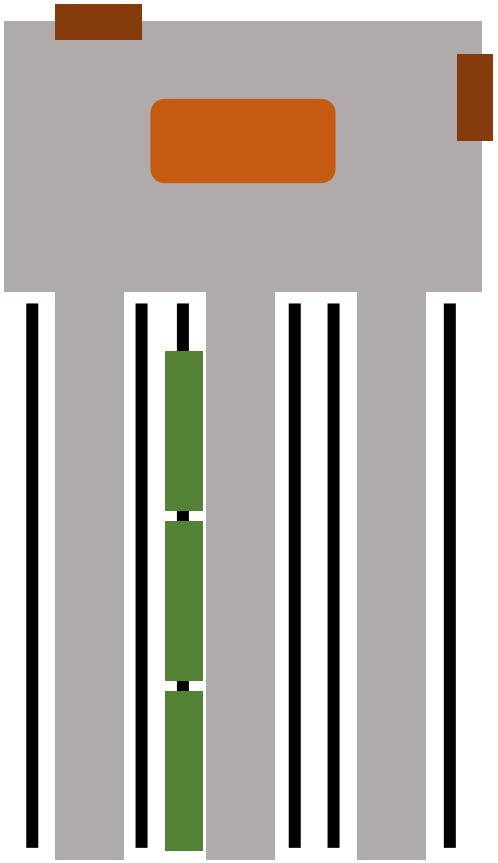
Simulation



After construction has begun, the client wants to add a retail island in the middle of the **train station** concourse.

What will be the effect on passenger movement?

The station must be cleared in 3 minutes in an emergency.



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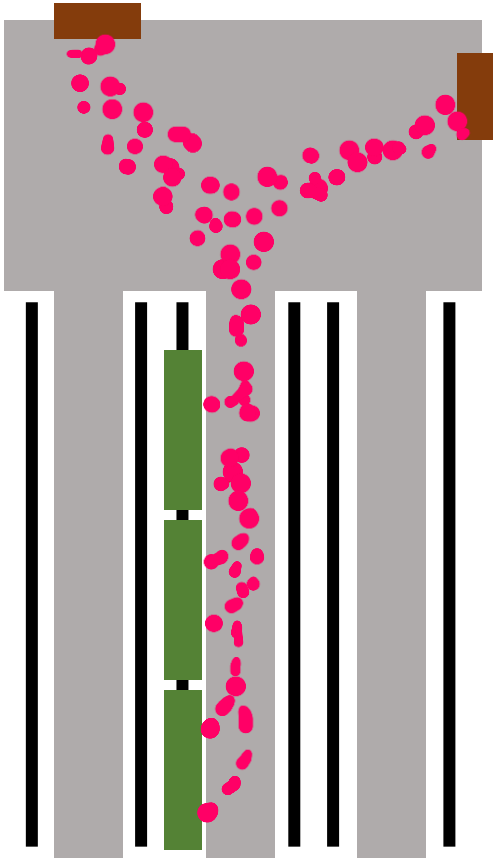
Simulation

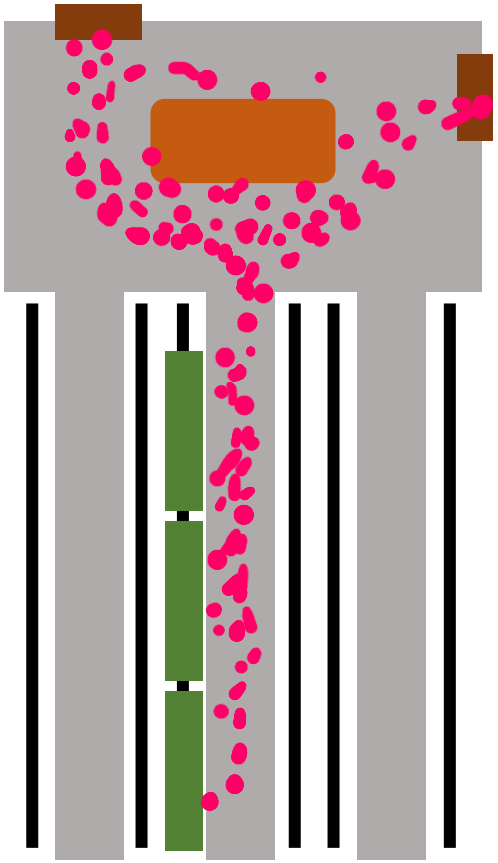


After construction has begun, the client wants to add a retail island in the middle of the **train station** concourse.

What will be the effect on passenger movement?

The station must be cleared in 3 minutes in an emergency.

A simulation model can examine how people will behave.



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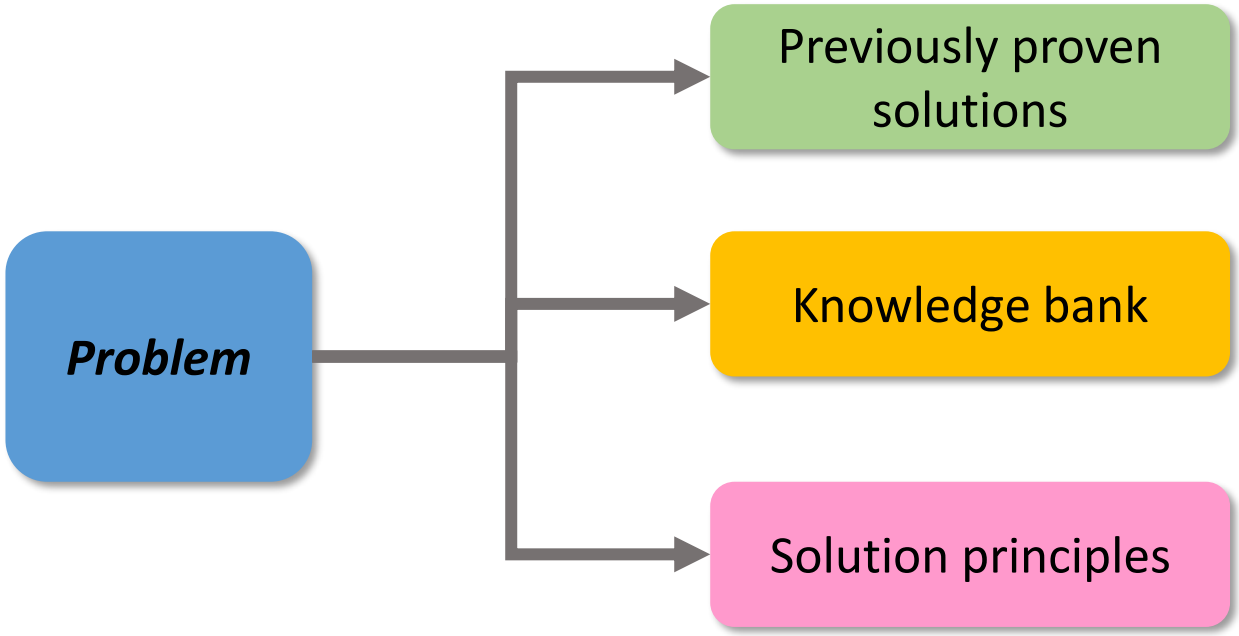
Solution catalogue



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TRIZ – theory of inventive solving

40 inventive principles

1	Segmentation
2	Taking out
3	Local quality
4	Asymmetry
5	Merging
6	Universality
7	Nested doll
8	Anti-weight
9	Prior counteraction
10	Prior action
	…

39 technical parameters Improve **this**, without making **this** worse		Weight of moving object	Weight of stationary object	Length of moving object	Length of stationary object	…
		1	2	3	4	…
1	Weight of moving object		-	8 15 29 34	-	
2	Weight of stationary object	-		-	1 10 29 35	
3	Length of moving object	8 15 29 34	-		-	
4	Length of stationary object	-	28 29 35 40	-		
…	…					

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Force field analysis

Problem: *Market research shows our corporate identity is seen as out of date*

Potential solution: *Change our corporate brand identity*

Project an up to date image

Distance us from defunct lines of business

Opportunity to embed new corporate culture

Cost of agency to do designs

Cost of new branding, packaging, etc

Probable waste of redundant materials

- 7 | **+ 12**

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Weighted scoring

Problem: *What is the best site for a new swimming pool?*

Rank potential sites against agreed criteria.

Factor	Weight	Site A	Site B	Site C
Close to town centre	4	2	4	2
Clear of flood plain	4	5	2	3
Flat site	3	3	5	1
Adequate car parking	2	2	2	5
Good road access	3	4	3	3
Next to bus route	4	5	4	2
TOTAL SCORE		**73**	**68**	**50**

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Modelling

Aspect	Manual model	Abstract model	Computer model
Example	Physical prototype	Spreadsheet model	Virtual environment
Development cost	**High**	**Low**	**Moderate to high**
Development time	High	Low to moderate	Moderate to high
Space needed	**Life size**	**None**	**Moderate**
Computing power needed	Minimal	Moderate	High
Speed of simulation	**Real time**	**High**	**Real time**
Ease of understanding	High	Moderate	High
Ease of trying alternatives	**Moderate**	**High**	**High**

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Team-based problem solving techniques

Workshop	6 to 16 people	Special room	1 day to 1 week	Led by independent facilitator	Seek a solution to a specific issue, in a positive, collective, and enthusiastic setting.
Laboratory	Up to 20 people	Dedicated space	Time limited – 20 to 60 days	Led by lab leader, fluid cross-functional team	Work on a particular problem or opportunity, through experimentation, prototype development, testing, etc.
Work session	Up to 12 people	Meeting room	1 day to 1 week	Led by project manager or team leader	In a less formal setting, examine a aspect of the project that is problematic.

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Workshop

An environment where people can work together to discover potential solutions to a defined problem.

- **Can be highly-structured and agenda-driven**
- Can be loosely structured with team expected to decide how they will work

Facilitation is an essential part.

Sandpit
Cross-disciplinary event building up from initial ideas to well-defined proposals. Harnesses different perspectives and areas of expertise.

Design thinking
A human-centred approach, stressing idea generation, prototypes and testing.

Hackathon
Event where developers use technology collaboratively to produce or improve software. Can involve some element of competition.

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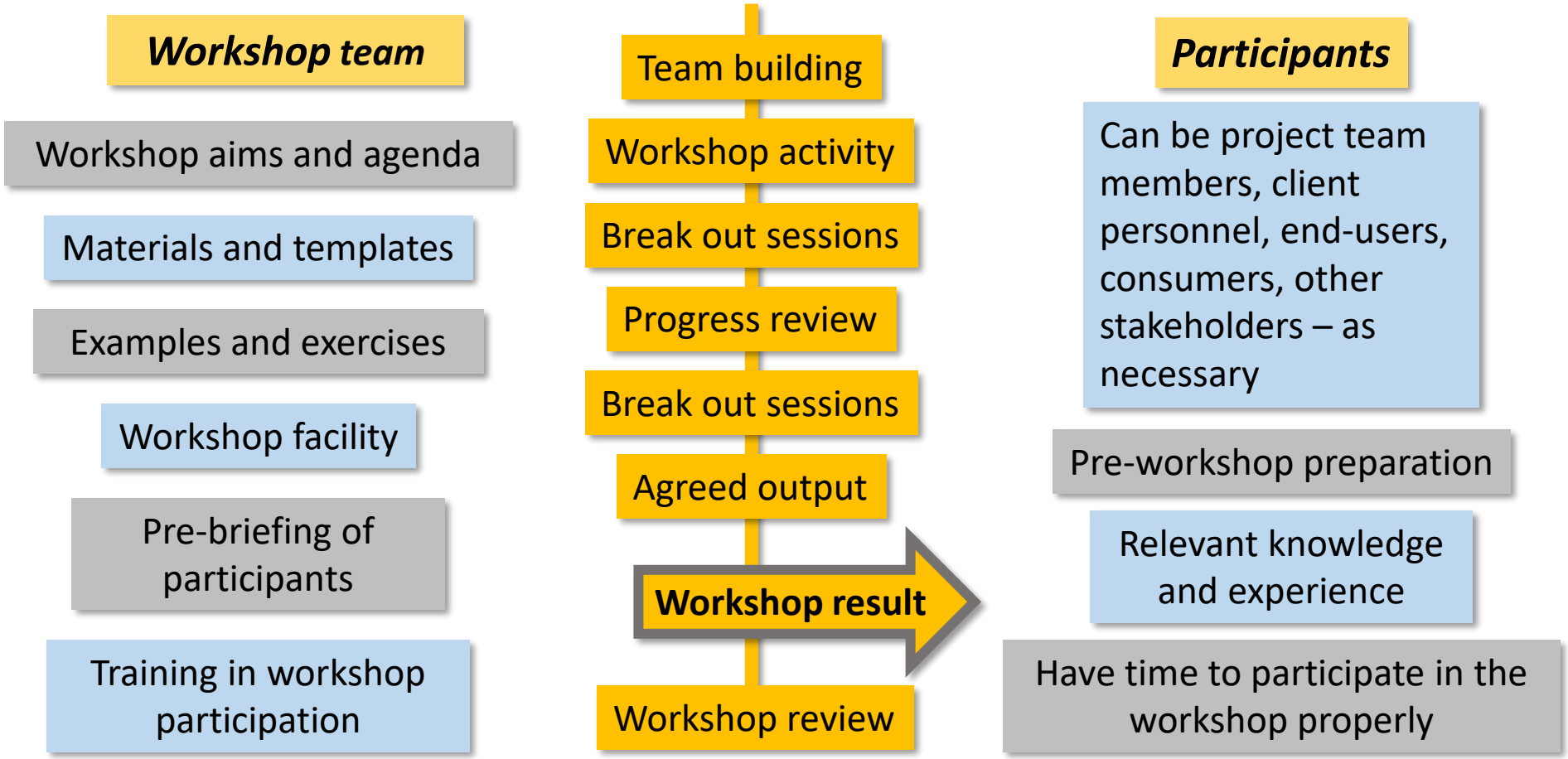
Workshop components



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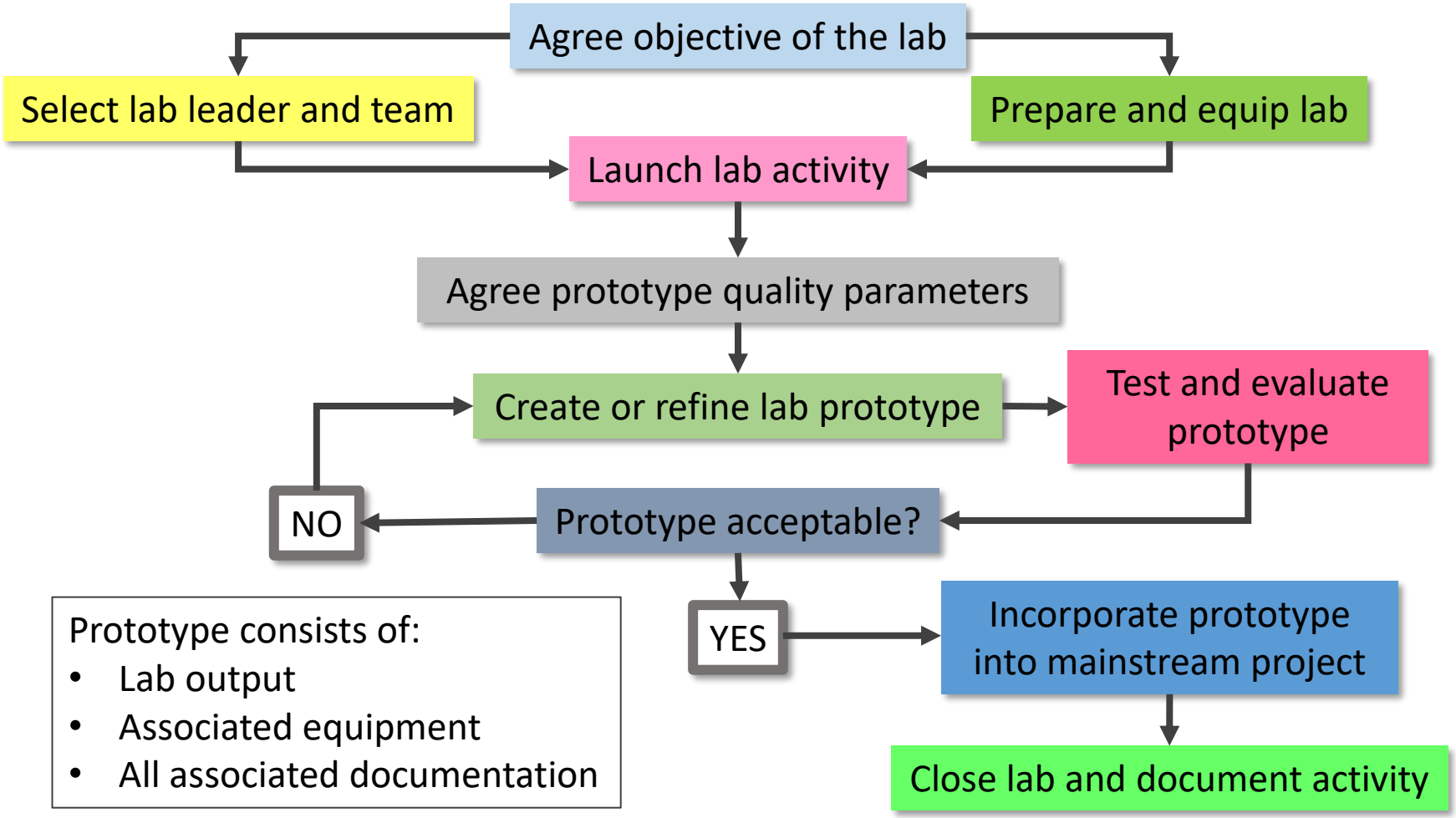
The laboratory process



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