



### **Creative & Group Thinking Techniques** A toolkit created by Skillfluence

Introduction & Purpose of this Handbook

This is a toolkit of creative and group thinking techniques that can help you create solutions for all types of challenges whether it's related to how you generate ideas, solve problems or collaborate with others. This booklet offers you new ways to be collaborative, innovative and wide-ranging in your response to challenges and opportunities.

The aim is to provide you with practical tools and techniques you can use to generate, invent and adapt ideas to achieve better outcomes. We draw on many tools that are in current use and which researchers have identified as being useful to them. These have been pulled together into one resource for you to utilise to create solutions to the typical challenges researchers, collaborators and multidisciplinary teams may face.

The tools and process are all in the public domain and we've provided links to references, examples or further reading where possible.







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### 1. The 5 W's and H

#### Questions whose answers are considered basic in information gathering or problem solving

The Five W's and H, are an influential, inspirational and imaginative checklist. The technique uses basic question generating prompts provided by the English language: Who? Why? What? Where? When? How?

The method is useful at any level from a formal checklist to complete informality. For example:

- Informal 'back-of-an-envelope' use is suitable as a guick-aide checklist, a • private checklist to keep in mind when in an on-going discussion, quick points scribbled down in a meeting, or to generate further questions.
- To generate data-gathering questions, during the early stages of problem solving when you are gathering data, the checklist can be useful either as an informal or systematic way of generating lists of question that you can try to find answers for.
- To generate idea-provoking questions, whilst brainstorming, brainwriting or some other such similar technique, the checklist could be used as a source of thought provoking questions to help build on existing ideas.
- To generate criteria, the checklist could help in generating criteria for evaluating options.
- To check plans, the checklist is a useful tool for planning implementation strategies.

The 'question words' owe their strength to their fundamental place in the English language, and can conceal some of the assets of nature that our language copes less well with. The responses to the questions in the checklist are usually facts, rather than actions or problems.

### 2. Toyota's 5 Why's

A powerful process to determine the root of any problem, it works particularly well for day-to-day issues and when there are human factors involved.

This is an easy-to-use tool you can use as an individual or in a group and it will help you get to the bottom of what seems like an entrenched problem. It can be done







verbally but it can be useful to write up the initial problem and then the answer to the question each time so there's a step by step written record.

When addressing a problem you simply keep asking the question "why" until you reach the underlying source of the issue. When asking "why" the answer given each time should be factual to ensure that it is a process based in reality rather than guesswork of what might have happened. The question "why" should be asked as many times as required until it's felt that the root cause has been uncovered. The end result is an action that provides a counter measure to prevent the problem from arising again rather than a solution to deal with the situation.

### 3. NESTA's problem definition process

When you want to clarify your priorities by focusing on key critical issues.

Defining a problem is a deceptively simple task - what at first seems to be the problem is often merely a symptom of a deeper problem. This tool works to both open a problem up - presenting it in a way that can be examined from a number of angles - as well as helping to define the wider context and associated issues involved.

This is particularly effective when trying to focus a team of people on the key problems at hand. This tool has been designed to structure the analysis of a particular problem in a way that makes good use of your time. It introduces a small set of key criteria by which an issue can be articulated and assessed, which makes the activity highly efficient. It also gives you a standardised way to compare several different problems which might seem to be very different on the surface.

#### How to use it

- Create a flip chart lengthwise with 5 columns
- Use the following as headings for the columns:
  - what is the key issue you are trying to address and why is it important?
  - who is it a problem for?
  - what social/cultural factors shape this problem?
  - what evidence do you have that this is worth the investment?
  - Can you think of this problem in a different way? Can you reframe it?







 Go through the problem definition worksheet individually or in small teams and reflect on a specific issue you have identified, exchanging thoughts while writing down your notes. The key aim here is to capture, compare and discuss different viewpoints on the problem. You can then review the notes and discuss with your team members whether you are making the same assumptions, and whether you are framing things in the same way. This exercise may lead you to 'reframe' the problem you initially addressed.

Reframing problems in such a way can offer clues to how the solution can take shape. Working on a problem definition worksheet with not only your team members, but together with other stakeholders, will usually bring up new contexts. Try experimenting and rephrasing questions to keep them relevant in such situations.

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### 4. Fishbone Analysis

A visualisation tool for categorising the potential causes of a problem in order to identify its root causes.

A fishbone diagram is useful in brainstorming sessions to focus conversation. After the group has brainstormed all the possible causes for a problem, the facilitator







helps the group to rate the potential causes according to their level of importance and diagram a hierarchy. The design of the diagram looks much like a skeleton of a fish. Fishbone diagrams are typically worked right to left, with each large "bone" of the fish branching out to include smaller bones containing more detail.

#### How to create a fish diagram:

- Create a head, which lists the problem or issue to be studied.
- Create a backbone for the fish (straight line which leads to the head).
- Identify at least four "causes" that contribute to the problem. Connect these four causes with arrows to the spine. These will create the first bones of the fish.
- Brainstorm around each "cause" to document those things that contributed to the cause. Use the 5 Whys or another questioning process to keep the conversation focused.
- Continue breaking down each cause until the root causes have been identified.

### 5. Metaphors

Metaphors are powerful tools in thinking creatively. A metaphor is simply a figure of speech in which a word or phrase is applied to an object or action to which it is not literally applicable. E.g. What famous person (in history or alive now) is like a Robotic System and why? To do this, you need to start by working out what are the key attributes that make something a robotic system? Then having done that you start to come up with ideas of a person that shares these attributes in some way.

#### **Explanation:**

When we compare a problem to something unusual, we tend to have a need to try to make sense of it. Consequently, we break down the comparison and analyze the different parts to see if doing so allows us to understand the problem or make it somehow familiar. When this happens we form new links and relationships that may lead to breakthrough ideas. Asking metaphorical guestions can stimulate a groups imagination.

#### When to use:

When we want to break down a problem or challenge into its constituent parts When confronted with something unfamiliar; relating it to something familiar can help When working in multidisciplinary groups

When trying to communicate complex ideas, processes or systems







#### You can use other metaphorical questions to stimulate your imaginations such as:

If you problem were a lawn, what would the weeds be? In what ways is a cold half-eaten pizza like the solution to the problem? What animal comes closest to resembling the essence of the problem? How is the problem like a flashlight battery? How can the similarities spark new ideas?

### 6. Classic Brainstorming

#### This is a useful technique to quickly gather a wide range of ideas from diverse groups

Start by providing a clear outline of what you are going to brainstorm. Have a flipchart or whiteboard available to write up ideas. Agree a set time period you'll brainstorm for (5 - 15 minutes). Open the session for everyone to give ideas and encourage everyone to participate.

Ideas should be noted on the flipchart but should not be judged for whether they are good or bad the idea is to generate a lot of ideas - you can decide how useful they are later. If you start judging ideas it will make people less likely to speak up so it's important to protect contributors from others ridiculing their wilder ideas. Once complete then you can look at whether ideas can be clustered, condensed or refined. You may want to discuss results further before prioritising/ranking them into actions or options.

#### When to use brainstorming:

- When you want to generate a lot of ideas or possibilities quickly
- When creative, original ideas are desired
- When you want participation of the entire group
- When a solution to a problem cannot be logically deduced
- When information about a problem is confused and spread across several people, to gather the information in one place







### 7. Individual Brainstorming

Useful when individuals want to work on their own challenge to generate a list of ideas or solve a simple problem.

Individual brainstorming can actually work even better than group brainstorming to generate ideas. Set the scene by minimising distractions so you can focus. Write a sentence stating your problem clearly and succinctly on a sheet of paper. Choose a timescale and start to write down ideas that occur to you, generating as many ideas as possible no matter how unrealistic.

If you start to struggle to come up with more ideas it can be useful to imagine the problem from a different perspective to gain fresh angles. Try putting yourself in someone else's shoes and imagine how they would solve the problem e.g. your supervisor, a celebrity or high achiever. Or imagine how you would solve it if you changed a specific attribute such as a different gender, nationality or age.

Once you have a list you can work through thinking about how to combine ideas and what to prioritise. It can be useful at this stage to share your thoughts as this can allow you to develop ideas more fully by drawing on the experience of others.

### 8. Structured Brainwriting

Can be a good, simple way of involving everyone in providing solutions and ideas in groups.

Split into groups with 5 - 8 people. Each person should write down a problem or question that they would like to be addressed at the top of a sheet of A4 paper. Once everyone has done this they should pass their sheet to the person on their right hand side.

Then everyone has 4 or 5 minutes (without discussion) to individually write down three ideas or potential solutions underneath the question. Once they've done this they should pass again to the right and each person can read the ideas already on the sheet before adding a further 3 ideas that can be new ideas or variations or developments of previous ideas. This continues with the paper passing to the right and ideas being added until each person's sheet comes back filled with ideas. They can then take some time to cluster and sort the ideas.



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### 9. Unstructured Brainwriting

A more fluid approach than above and is useful when time is limited or participants want to think about more than one problem or question.

In groups of 5 - 10 with a set time period 10 - 40 minutes. Each person can have up to 3 problems or questions that they would like to be addressed and should write each one at the top of separate sheets of A4 paper.

Everyone's sheets are put in the centre of the table. There are no rounds participants work at their own pace taking a sheet from the centre, reading what's already been added and then contributing their own ideas or vary and develop existing ideas. Once time is complete participants can take back their own sheets and sort and cluster ideas.

# **10. Nominal Group Technique**

Group brainstorming that allows greater parity of participation than classic brainstorming and can lead to more creativity and is particularly good for getting consensus

The group should be considering a specific question and everyone should take 10 minutes to individually, without collaborating, write down on a sheet of paper whatever comes to mind when considering the question.

Everyone then share their ideas and someone records their ideas on flipchart – this can be done in a round robin style. There should be no discussion or debate at this point and everyone should be encouraged to continue writing down their ideas whilst others ideas are being shared. This can take anywhere from 10-30 minutes and is designed to involve everyone and create a written record.

The next stage is a group discussion of the ideas providing opportunity to gain clarification. Try to make sure everyone is involved and keep the discussion flowing without over focusing on any one idea. Items and ideas can be added and other ideas can be combined into categories but no ideas should be discarded. This may take 30-40 minutes.

Final stage is for voting and ranking in relation to the ideas – this can be done by show of hands or the "3 dot" technique where each participant is given 3 dots and



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asked to add a dot to their top 3 preferred ideas on the flipchart. The top ideas can then be brainstormed again or worked on by small groups to continue to hone and re-evaluate.

### 11. Ideatoons

A way to get ideas by using pattern language: abstract symbols instead of words combining verbal and visual thinking.

Pattern language is a visual thinking technique that can be used to see new and different relationships between attributes. The language consists of a number of abstract visual symbols that you create to substitute for words. Don't dwell on drawing expert symbols - your drawing skills are not relevant. You can do this individually or in groups.

- 1. Divide your challenge into attributes
- 2. Describe each attribute by drawing an abstract graphic symbol. Draw it on a separate post-it. Whatever feels right for you. Use colours of pen, post-it and image symbolically too. On the back of the post-it, write the attribute.
- 3. Place all the post-its on the table and try grouping and regrouping them mix and match the symbols to provoke ideas.
- 4. Look for ideas and thoughts that you can link to your challenge. Try to force relationships and record the most idea-provoking arrangement
- 5. If you come to a stalemate add new symbols or start a new set with completely different symbols.

# 12. SCAMPER

SCAMPER is an acronym for seven thinking techniques that help those who use them come up untypical solutions to problems.

### How to use S.C.A.M.P.E.R.

At any point in a creative-thinking situation, alone or in a group, novel solutions emerge when those involved force themselves to think in an arbitrarily different way. For that reason, using any or all of the seven thinking approaches listed below will help those who use them produce surprising and sometimes very useful results.







Keep in mind the principal of force fitting. If you can't think of anything in response to the SCAMPER prompt you're using, then force a response, no matter how ridiculous it seems, and think of ways to make the non-logical response work.

**Substitute:** What could you remove and replace with something else? Materials, rules, people, resources, processes. Example - Boeing substitute metal for lightweight composite materials to make aircraft lighter.

Combine: What could you bring together to create something new or additional? Combine with another product, organisation, material, combine purposes, resources or talents? Example - Trevor Bayliss combines mechanical power with a radio to make the clockwork radio and you can see in the photo it's also been combined with a torch.

Adapt: How could you readjust to another sector, setting, space, where else or what other context or market could it work in? Example - The domestic microwave oven was developed from military communications technology.

Modify: Magnify, make smaller or exaggerate an aspect or attribute including size. colour, shape, look, feel. What could you highlight or emphasize or what function could be added? Example - Instead of daily pill taking, slow release drugs are formulated to be taken at less frequent intervals.

Put to other use: Challenge assumptions about the purpose or intention. Could it work differently in another setting, industry or customer group, can one aspect be used elsewhere or the waste recycled to make something new? Example - Fibre optics were first used for internal medical examinations and later used for longdistance communications.

Eliminate: What could you simplify, reduce or remove entirely? How could it be segmented or split and what would you do if you removed one aspect or part - how would you replace it? Example - Eliminate haulage costs by sourcing local production materials.

Rearrange: What would happen if you sequenced things differently, reversed them, turned them upside down or changed the direction of flow? Try changing pace, pattern or create something unexpected. Example – When brewing beer, adding flavours before or after fermentation will change the taste profile.

Try it out, choose one technique and come up with as many ideas as you can. Once you've brainstormed ideas then it's important to identify which ones are genuine opportunities that you could progress.



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### 13. Force Field Analysis

### Analysing the Pressures For and Against Change

When you're making difficult or challenging decisions, it pays to use an effective, structured decision-making technique that will improve the quality of your decisions and increase your chances of success.

- 1. Define the change you want to see. Write down the goal or vision of a future desired state. Or you might prefer to understand the present status guo or equilibrium.
- 2. Brainstorm or Mind Map the Driving Forces those that are favourable to change. Record these on a force field diagram.
- 3. Brainstorm or Mind Map the Restraining Forces those that are unfavourable to, or oppose change. Record these on the force field diagram.
- 4. Evaluate the Driving and Restraining forces. You can do this by rating each force, from 1 (weak) to 5 (strong), and total each side. Or you can leave the numbers out completely and focus holistically on the impact each has.
- 5. **Review the forces.** Decide which of the forces have some flexibility for change or which can be influenced.
- 6. **Strategize!** Create a strategy to strengthen the driving forces or weaken the restraining forces, or both. If you've rated each force how can you raise the scores of the Driving Forces or lower the scores of the Restraining Forces, or both?
- 7. Prioritize action steps. What action steps can you take that will achieve the greatest impact? Identify the resources you will need and decide how to implement the action steps. Hint: Sometimes it's easier to reduce the impact of restraining forces than it is to strengthen driving forces.

### 14. Challenge Definition

Finding opportunities often begins by noticing problems. This can start by being articulated as a wish "I really wish we could..." and sometimes it comes out as a gripe "It annoys me that we're not..."). You can use either of these as a starting point to articulate your dreams and challenges and then use them to reflect back opportunities to design solutions.







To do this start by

- Writing a list of gripes: things that you think could be better
- Writing a list of dreams: things that you wish existed

Follow this by flipping these statements into potential solution focused challenges. Begin your question with "How might we..." This turns the problems you have spotted into opportunities for designing solutions, reframing from a problem to a possibility.

### 15. Disney's Creative Strategy

Transform dreams, fantasies and wishes into concrete reality by exploring them using three different perceptual positions.

A creative thinking technique that synthesizes three different strategies: the dreamer, realist, and the critic. A dreamer without a realist is often not able to translate fantasies into tangible reality.

A dreamer and critic become engaged in constant conflict. A dreamer and realist can create things but find that a critic helps to evaluate and refine the final products. Disney used the same three strategies to keep his staff coordinated in their thinking on a particular project. He moved the ideas around three rooms. Each room had a different function. Following are descriptions of each part of the process. Each separate stage can be carried out by an individual or by separate groups.

#### The dreamer

Spins innumerable fantasies, wishes, outrageous hunches and bold and absurd ideas without limit or judgment. Nothing is censored. Nothing is too absurd or silly. All things are possible for the dreamer. To be the dreamer, ask: If I could wave a magic wand and do anything I want - what would I create? How would it look? What could I do with it? How would it make you feel? What is the most absurd idea I can conceive?

#### The realist

The realist takes the dreamer's ideas and works them into something realistic and feasible. It's about trying to figure out how to make the ideas work and then sort them out in some meaningful order. To be the realist, ask: How can I make this happen? What are the features and aspects of the idea? Can I build ideas from the features or aspects? What is the essence of the idea? Can I extract the principle of the idea? Can I make analogical-metaphorical connections with the principle and







something dissimilar to create something tangible? How can I use the essence of the idea to imagineer a more realistic one?

#### The critic

**R**eviews all the ideas and tries to punch holes in them by playing the devil's advocate. To be the critic, ask: How do I really feel about it? Is this the best I can do? What can make it better? Does this make sense? How does it look to a customer? A client? An expert? A user? Is it worth my time to work on this idea? Can I improve it?

### 16. Pitching Framework

A framework for distilling an idea into a short summary that will give clear relevant information and leave your audience interested to hear more

This is your chance to tell a story about your idea. Start with something that will grab people's attention and make them interested in the rest of the pitch. This could be questions as simple as: "How many of you have ever done 'x'?" Or "What do you do when 'y' happens?". It could be showing a demo. It could be an exciting or startling fact or statistic: "did you know that....". Or state the problem in stark terms - One million people injure themselves using fitness equipment every single year - and it's completely preventable.

Attention-getter: use an interesting start or hook to grab attention

**Problem:** define the problem or need you're solving. What pain are you alleviating or what pleasure are you providing and for who

How big is the problem? How many people does this affect and how much does it affect them?

Introduce yourself: who you are, your role and/or your team and experience, why are you the right team for this?

**Solution:** describe your product/service clearly explaining the value to customers. What is the value of the pain you alleviate or the value of the pleasure you provide? Differentiator: what makes you stand out from the competition or current alternatives?

Call to Action: end with your ask, what do you want or need?







### 17. Mind Maps

#### A visual technique focusing on the relationships and links between ideas so they are not just a list of disconnected ideas or facts.

Mind maps are a versatile tool as they can be carried out in large groups, small groups and by individuals. Start by writing the concept, topic or goal that's being explored in the middle of the sheet or flipchart and draw a circle round it. New ideas that relate to the central topic should be written on a line drawn out from the centre and then related ideas can branch out from those as further subdivisions. Use key words rather than sentences and try to use different colours as well images and symbols. You should be able to create a visual map that has natural organisation radiating from the centre and helping to forge links and make connections you may not have considered.

Group mind maps can be created by brainstorming as a large group or by asking individuals or small groups to generate ideas and then merging them into one large mind map. During this process new ideas can be generated and existing ideas expanded on.

### 18. Affinity Diagrams

Useful when you've gathered ideas and want to summarise and categorise ideas and data so it's in a format for analysis and ranking

Copy all ideas or solutions on to post it notes (this could be for example from a brainstorming session). Put all the post it notes on wall or table and start clustering them by moving them around to place similar ideas and themes together looking for ideas that seem related in some way.

Make sure everyone is involved and that clusters and groupings are of a reasonable size; if there are too many it's confusing and unmanageable if there are too few it can be purposeless and doesn't allow for analysis. Continue until all post its have been sorted and the group is satisfied with their groupings.

Once complete you can discuss any surprising patterns and reasons for where 'controversial' post-its are placed and clarify understanding. During this discussion post its can be moved, then when like ideas are together the group should decide on a name or descriptor for each cluster and write it at the top of each cluster.







#### When to Use an Affinity Diagram

- When you are confronted with many facts or ideas in apparent chaos
- When issues seem too large and complex to grasp
- When group consensus is necessary

### 19. Brutethink

#### Random words will spark a fresh association of ideas in your mind.

The brain tends to fill in the missing gaps in order to perceive complete forms and to fill in the missing information to make a relationship whole.

Connections can provide you with new information about your challenge, a different perspective about the problem or perhaps an analogy that has its own line of development.

#### BruteThink steps

- 1. Choose a random word e.g. bottle
- 2. Think of a variety of things that are associated with your chosen word.
- 3. Force connections between your random word and the challenge you're working on.
- 4. List your ideas.

### 20. Prioritising Dots

#### Allows groups and teams to organise and prioritise options

Participants are given a sticky dot and ideas should be written up on flipchart or whiteboard (you may already have done this as part of brainstorming process). Participants are then all asked to add their dot to the option they think is most important. If there are quite a few options to choose from participants can be given 3 or 5 sticky dots and have to choose their top 3 or 5.

Once everyone has done this the facilitator can then add up how many dots each option has received allowing them to be ranked by level of importance to the group and also may allow some ideas to be discarded.







### 21. Star Count

Similar to Prioritising Dots but allows everyone to emphasise critical points by assigning more weight to them.

Give everyone 10 stars and ask them to distribute their stars to an idea or issue according to how important or necessary they feel it is. They may put up to three stars against an idea or issue which allows them to place emphasis on the points they think are most important.

### 22. Gap Map

Useful for both group and individual problem solving and done well can provide a tangible set of steps to take

Consider the problem you are trying to solve. What is the situation at the moment (Point A) and where do you want to get to (Point B). Now brainstorm or write down all the steps that need to be taken to bridge the gap from Point A to Point B and then turn this into your prioritised step by step to-do list.

# 23. Round Rap

A very quick way of making sure everyone contributes; particularly useful to assess thoughts and feelings during a discussion or topic.

This is a structured way to rapidly gather statements or feelings from everyone in a group. Carry out a brisk "round the group" asking each participant to speak briefly. You can simply get each person to give a quick statement by asking for a thought or a feeling usually on a topic to find out understanding, readiness or agreement.

# 24. Lean Canvas

### A tool to test whether you have a viable business model.

This is a great tool to use if you have an innovation that you think could be marketable as a product or service. It comes from the concept of lean startup of



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using a scientific approach to systematically get from your first idea, 'Plan A' to a plan that works without running out of resources.

### 1. Customer Segments and Early Adopters

Who are your possible customers? What do they have in common? What are their differences? Describing multiple groups of target customers allows you to systematically categorise potential customers for your product. Early adopters are the enthusiasts who like to be in at the start.

#### 2. Problem

Put yourself in your customer shoes. The customer problems need to be relevant to many people, be important and not have an easy workaround. Distil it down to the 3 most important, compelling, problems. Identify alternative products/services that exist & include here potential competitors.

#### Solution

What are your solutions for each of the customer problems? Identify the features and attributes that will tackle the problems. What characteristics of your solution are key to your product and key to solving the problems face by your customer?

#### **Unique Value Proposition** 4.

What are the benefits your customer will have after using your product? Why are you different and worth buying. Why will customers choose you over competitors? Will you offer convenience, speed, accessibility, customisation, social or environmental benefits?

#### 5. Channels

These are the paths to your customer and the points or places where your customer will encounter your brand. How will you sell to, communicate with and reach your customers?

#### 6. Revenue Streams

Is your business model financially sound? What are customers willing to pay, what do they pay now, how do they pay. What is your revenue model, how much will you charge?

### 7. Cost Structures

What costs are there to operate your business model, fixed and variable. Equipment, manufacturing, transportation, materials, labour?







#### 8. Key Metrics

What will success look like, how will you measure the progress of your company? Identify key customer actions that drive value and the activities you will use to measure your value proposition

#### 9. Unfair Advantage

What is your competitive advantage that is unique & not easily copied? What might exclude others from operating the same business model as you? Network, community, location, intellectual property

### 25. SWOT Analysis

SWOT Analysis is a critical part of planning and a useful tool to use before starting a project. It can be used for a specific project or programme or with a department, organisation or sector. It is used to identify relevant internal (strengths & weaknesses) & external factors (opportunities & threats).

Once completed the SWOT analysis should be reviewed and prioritised to identify the critical factors in each category. These factors can be used to develop goals, objectives, strategies and tactics and to identify opportunities for partnerships and collaborations.

Strengths What are you already doing that works well What resources can you draw on (that others can't) What do your stakeholders see as your strengths What do you do better than others?	Internal Factors	Weaknesses What should you avoid? What can you improve? What might others see as a weakness? What could be damaging or negative?
<b>Opportunities</b> Have there been technological changes you could use? Are there any favourable trends or situations you can spot? Is there anything new, unique or interesting you can capitalise on?	External Factors	Threats What are your competitors doing? What issues and challenges do you face? What are your stakeholders concerned about? What might go wrong?

