Creativity

Creativity is the act of turning new and imaginative ideas into reality. Creativity is characterised by the ability to perceive the world in new ways, to find hidden patterns, to make connections between seemingly unrelated phenomena, and to generate solutions.

Personality

Creativity

Intuition

Music

Art

Spatial abilities

Right Hemisphere

Left Hemisphere

Logic

Math

Language

Reading

Writing

Analysis
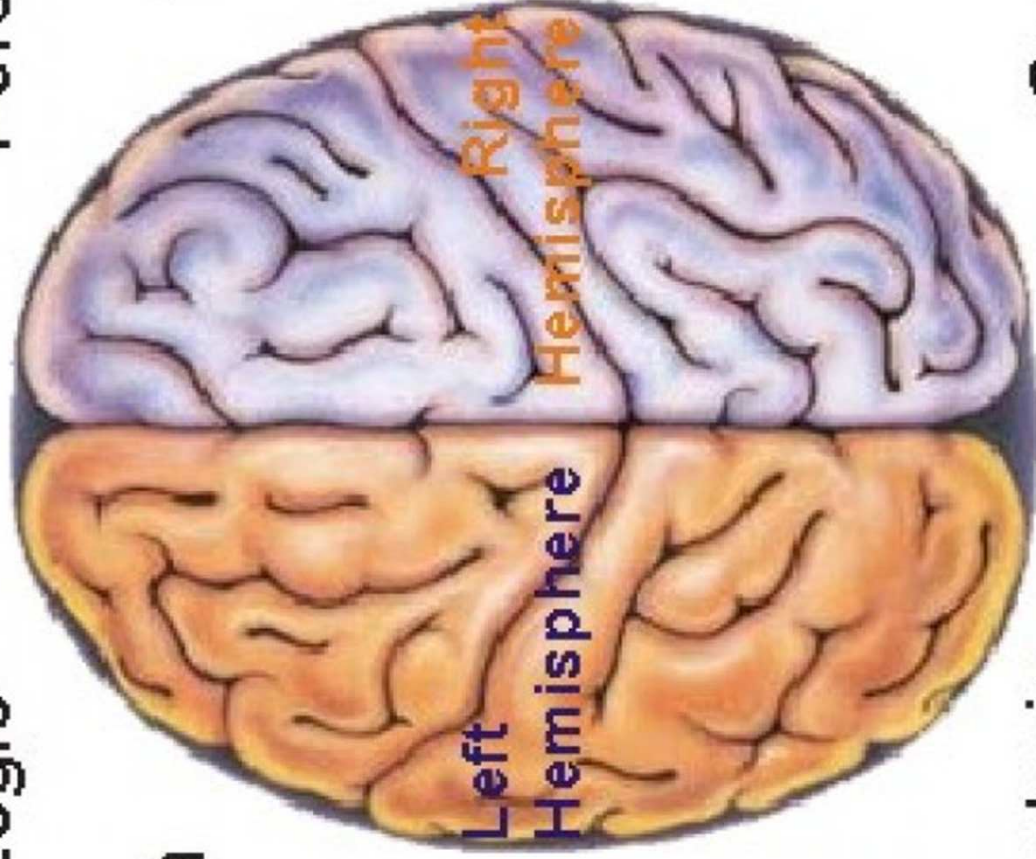
Three Components of Creativity

how flexibly and imaginatively people approach problems

technical, procedural, and intellectual knowledge

intrinsic is more effective than extrinsic

Creative-thinking Skills

Expertise

Motivation
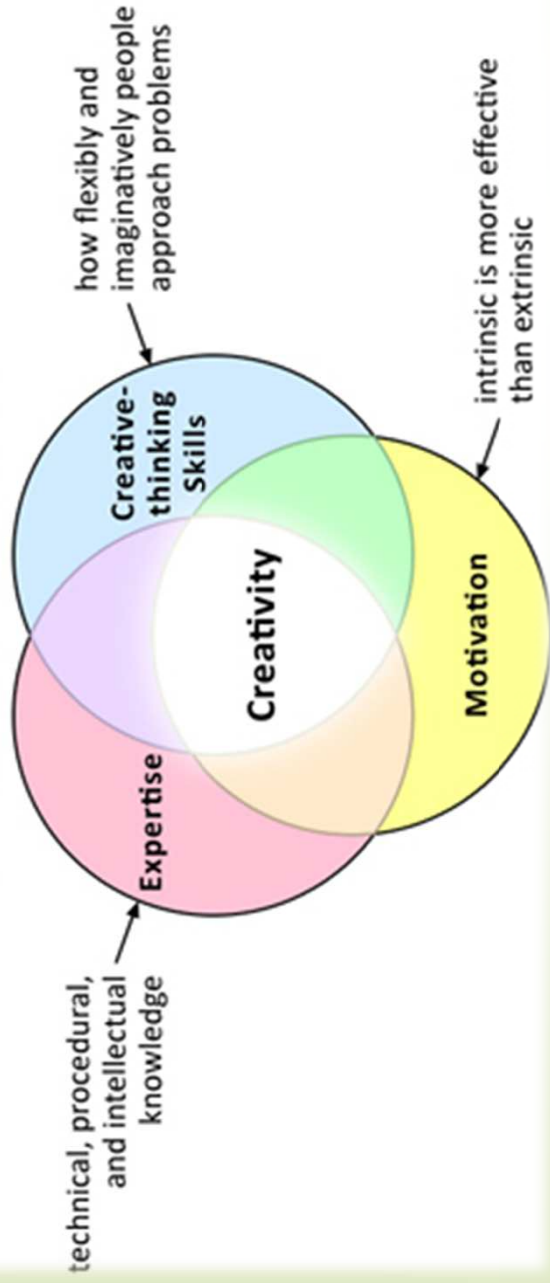
Creativity

THE BASIC ELEMENTS OF CREATIVITY

COPY TRANSFORM COMBINE
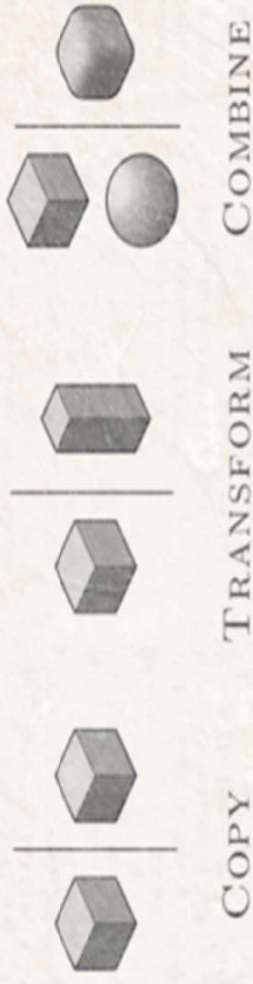
CREATIVE DESIGNS

➢ If a new problem is being dealt, Solution to it can be called creative.

➢ If existing problem is solved differently with some improvements it can be called creative.

➢ Look at the existing product and think of new ways to improve it.

THINKING PROCESS

Think of creative ideas to overcome a social crisis

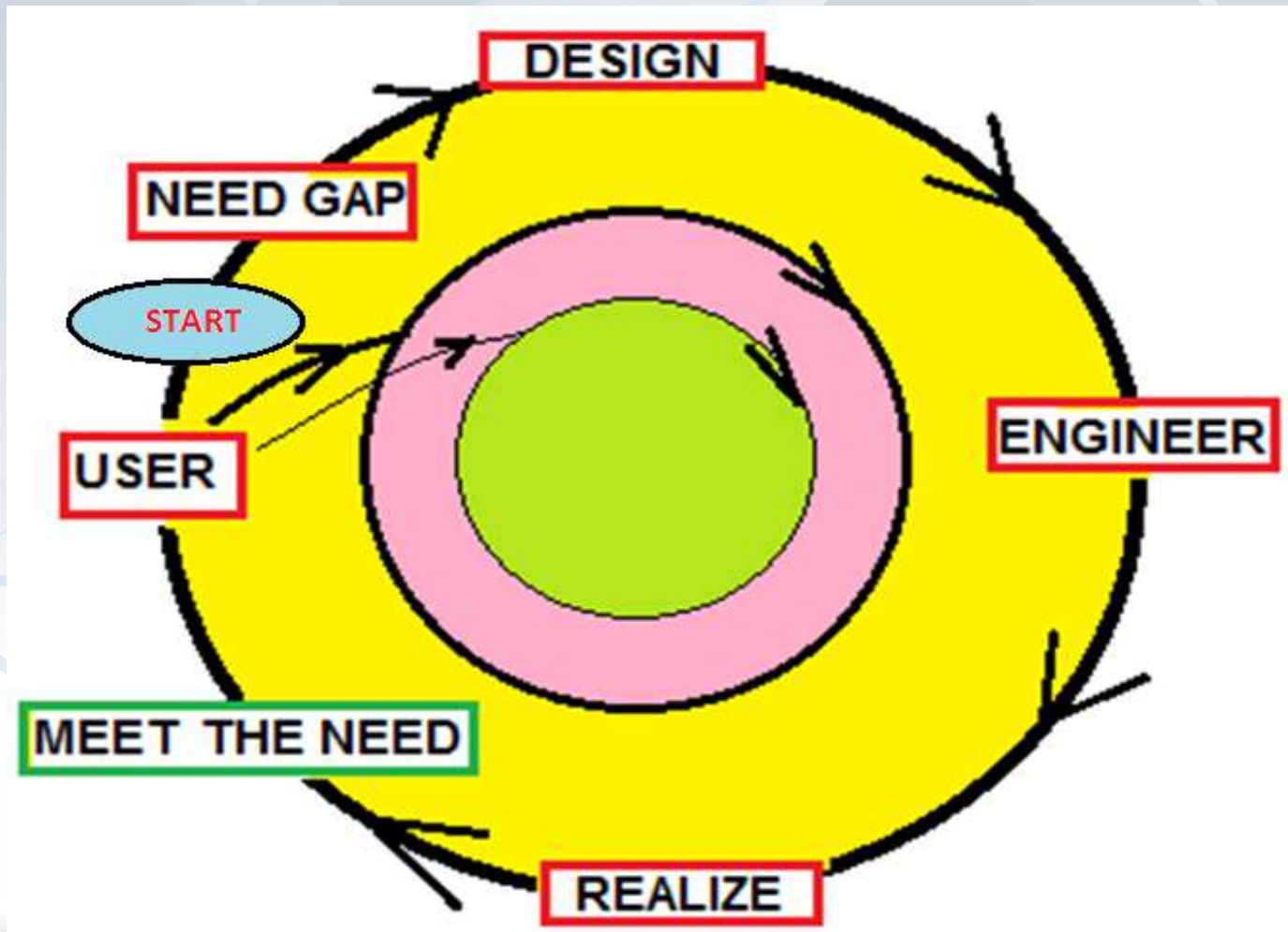**E.g.: A floating machine to trim off and remove weeds from surface of water bodies.**

Think of Creative idea to improve existing artifacts

E.g.: Roomba: Automatic vacuum cleaning robot

Think of any invention that can be used to develop new product

**E.g.: Velcro as a replacement for shoe lace**

DESIGN FRAMEWORK

Develop a creative attitude :

It is essential to develop confidence that you can provide a creative solution to a problem. Although you may not visualize the complete path through to the final solution at the time you first tackle a problem, you must have self-confidence ; you must believe that a solution will develop before you are finished. Of course, confidence comes with success, so start small and build your confidence up with small successes
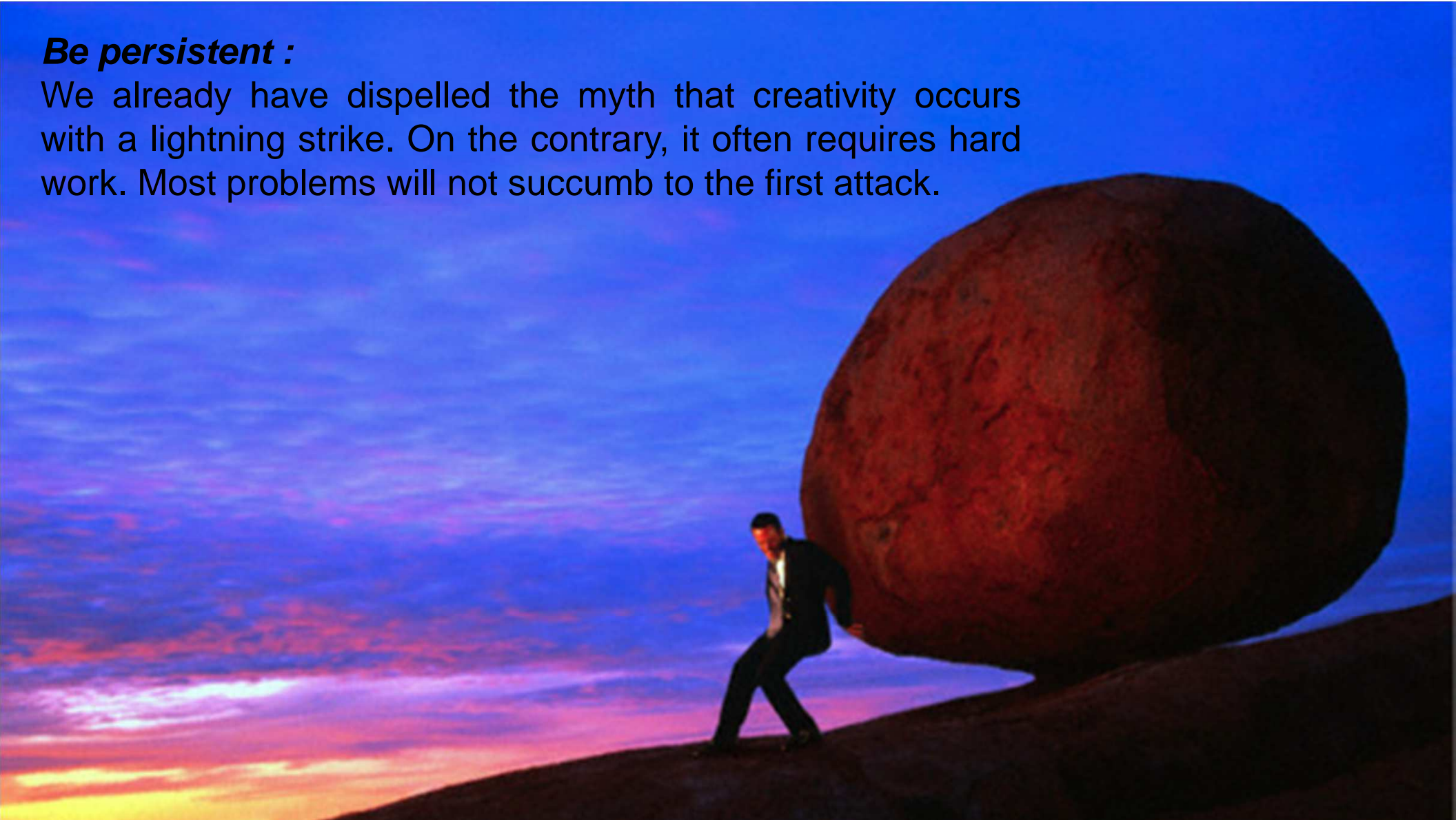
Unlock your imagination :

You must rekindle the vivid imagination you had as a child. One way to do so is to begin to question again. Ask "why" and "what if," "Why Not" "How"
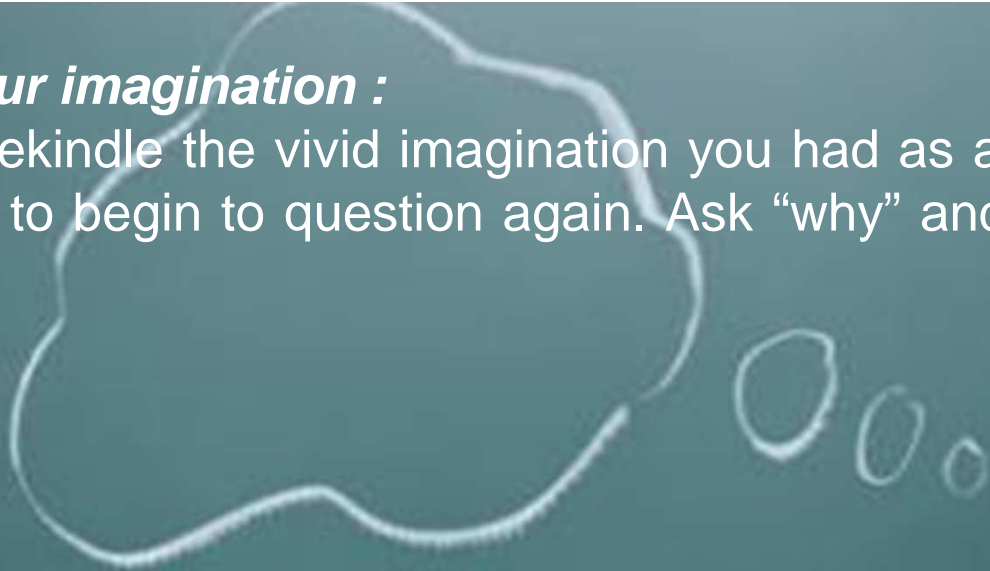
Be persistent :

We already have dispelled the myth that creativity occurs with a lightning strike. On the contrary, it often requires hard work. Most problems will not succumb to the first attack.

Develop an open mind *:*

Having an open mind means being receptive to ideas from any and all sources. The solutions to problems are not the property of a particular discipline, nor is there any rule that solutions can come only from persons with college degrees.

Suspend your judgment :

We have seen that creative ideas develop slowly, but nothing inhibits the creative process more than critical judgment of an emerging idea. Engineers, by nature, tend toward critical attitudes, so special forbearance is required to avoid judgment at an early stage of conceptual design.

Set problem boundaries :
We place great emphasis on proper problem definition as a step toward problem solution. Establishing the boundaries of the problem is an essential part of problem definition. Experience shows that setting problem boundaries appropriately, not too tight or not too open, is critical to achieving a creative solution.
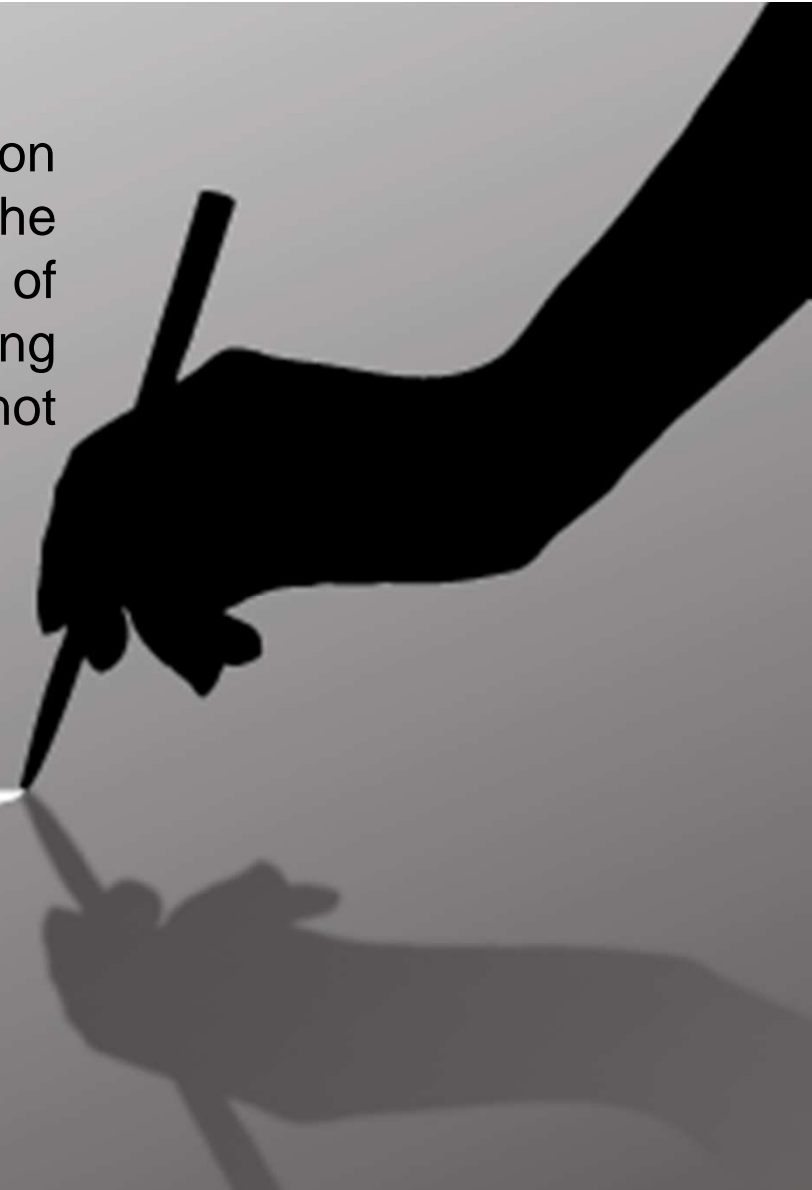
How to
Initiate Creative
Thinking ?

Sit somewhere with no distractions, think again what you have already done and start jotting down ideas

Start sketching

whatever in your
mind or visualizing

Now start putting things haphazardly.
Pick out things that catch your eye & put them all together.

Then start again over.
You should continue this process a few times until you run out of ideas.

should this be
the **focal point?**
Will it work
correctly ?

Basically it is like a flow chart.
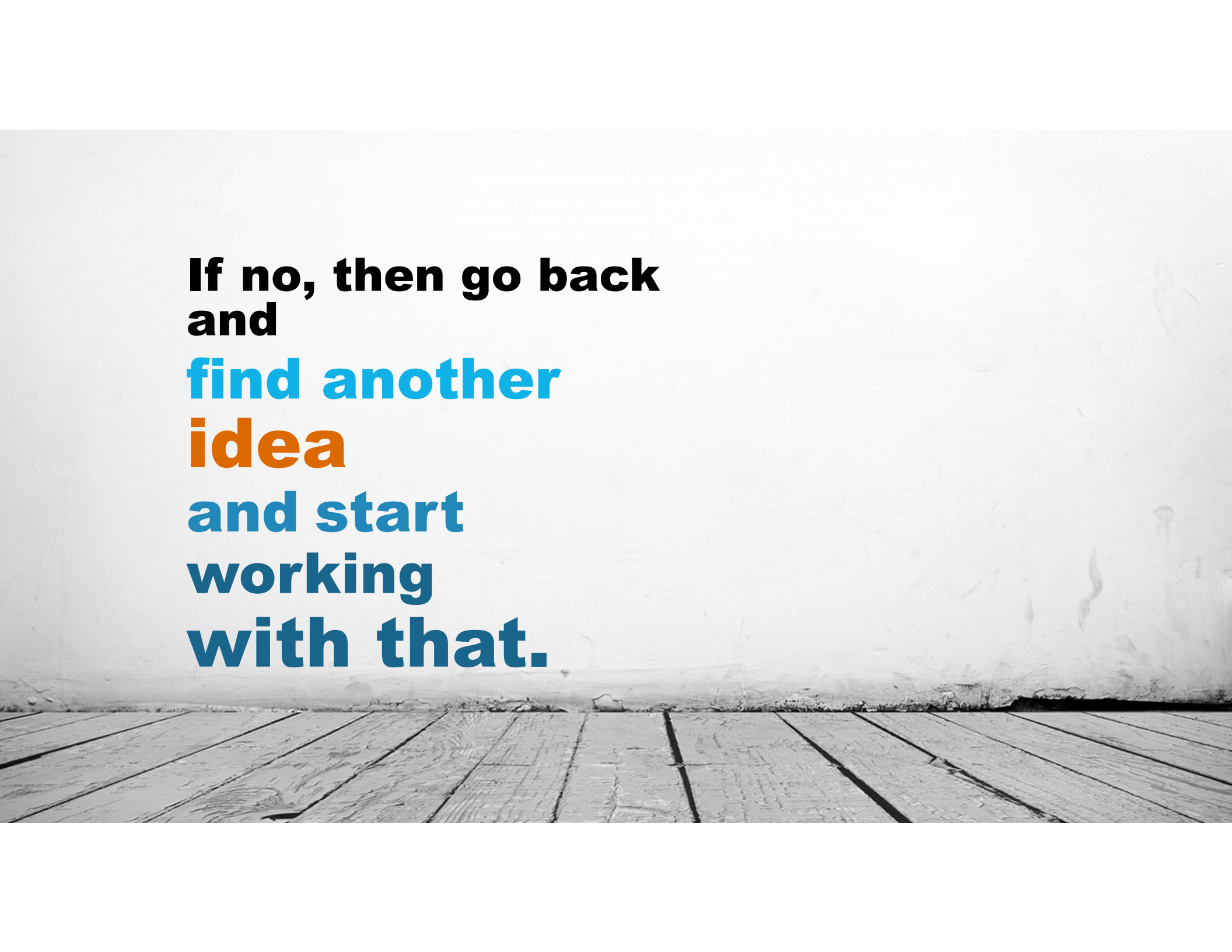
If yes, then keep working on it.

You should look for **other items and accessories** also that **coordinate** with it.

If no, then go back and

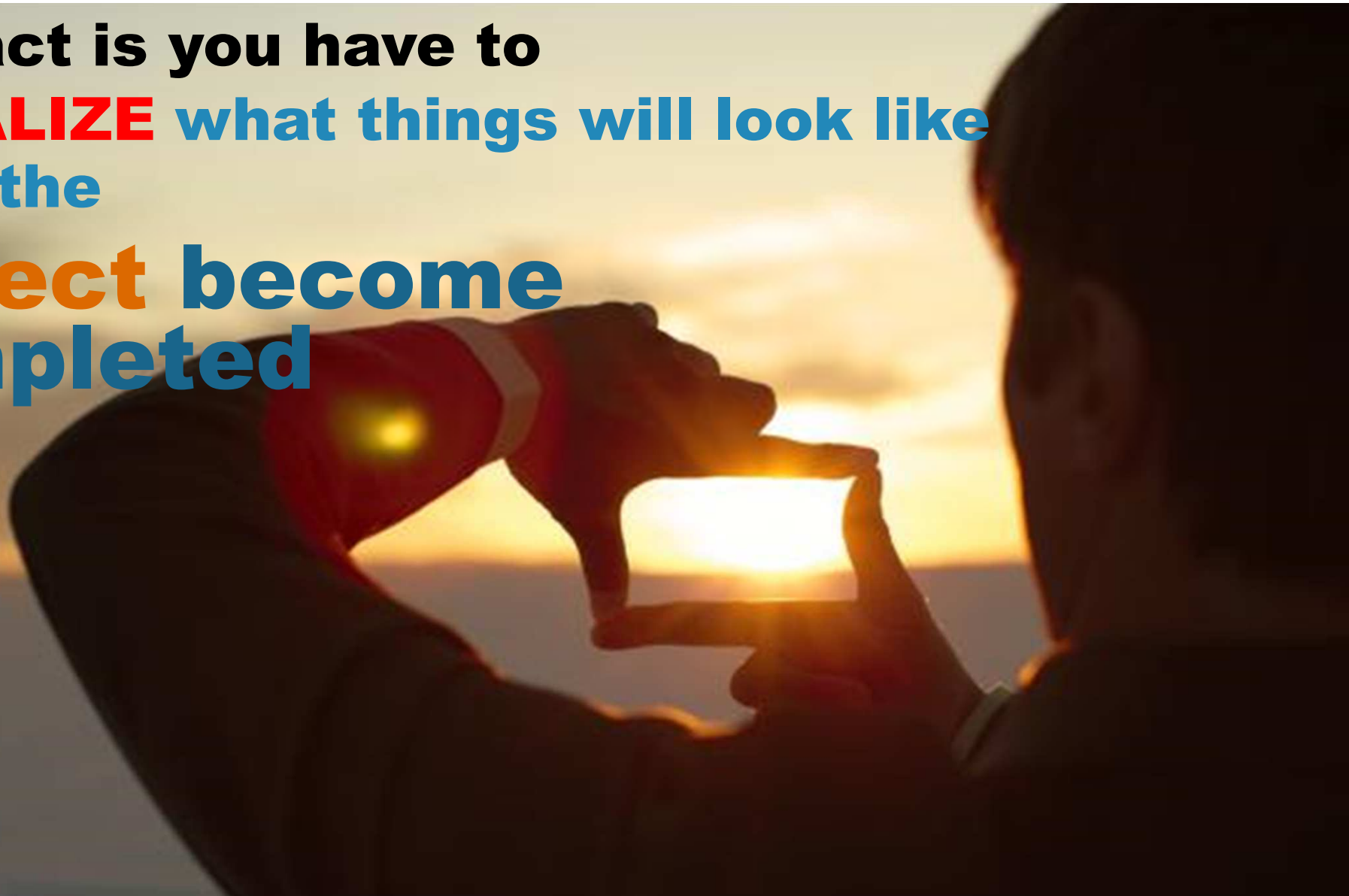**find another**

idea

and start

working

with that.

You may have come up with an even better **idea** of your own for **brainstorming**

The fact is you have to **VISUALIZE** what things will look like when the **project** become completed

"Genius is 1% inspiration, 99% perspiration."
—Thomas Alva Edison
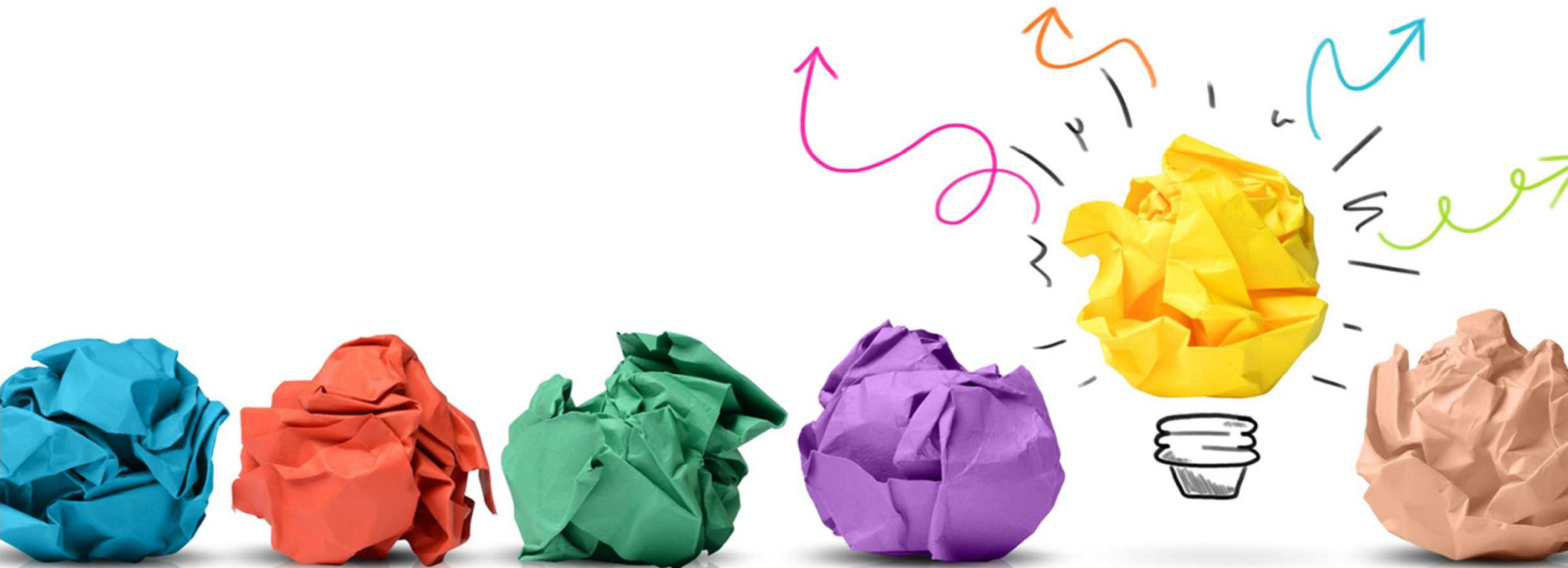
Brainstorming is a group creativity technique by which efforts are made to find a conclusion for a specific problem by gathering a list of ideas spontaneously contributed by its members.
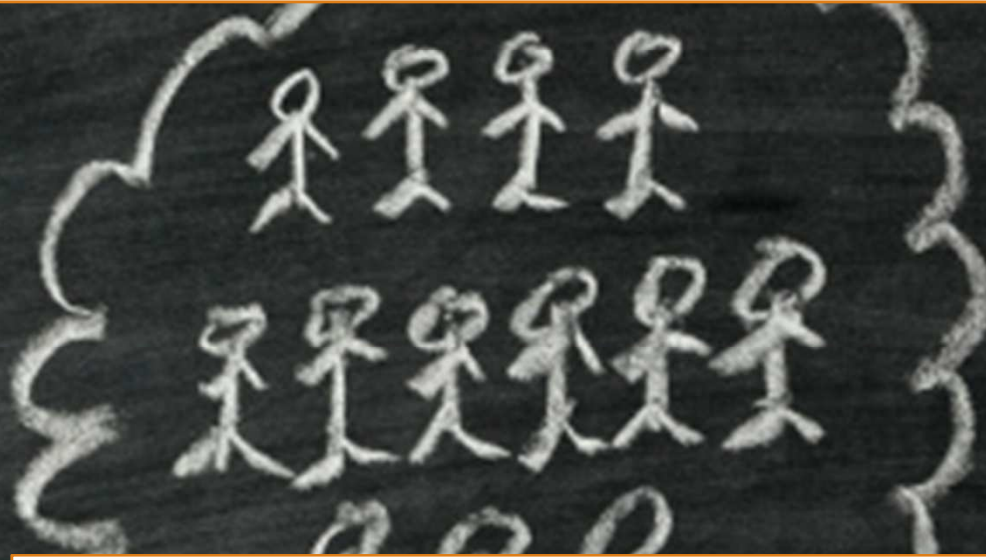
Collaboration is key! As you can see, all group participants are actively involved in an effective brainstorming session. You'll also notice that this group is getting really creative by brainstorming visually with paints. Brainstorming can take many different forms. Your group should choose to brainstorm ideas in a format that works the best for you.

Idea

Tips for Effective Brainstorming

#1 Assign a Moderator

Assigning someone to guide the brainstorming session into a productive direction is an absolute must. Though the entire point involves the free flow of ideas, this can quickly get completely off track and out of control if not kept in check.
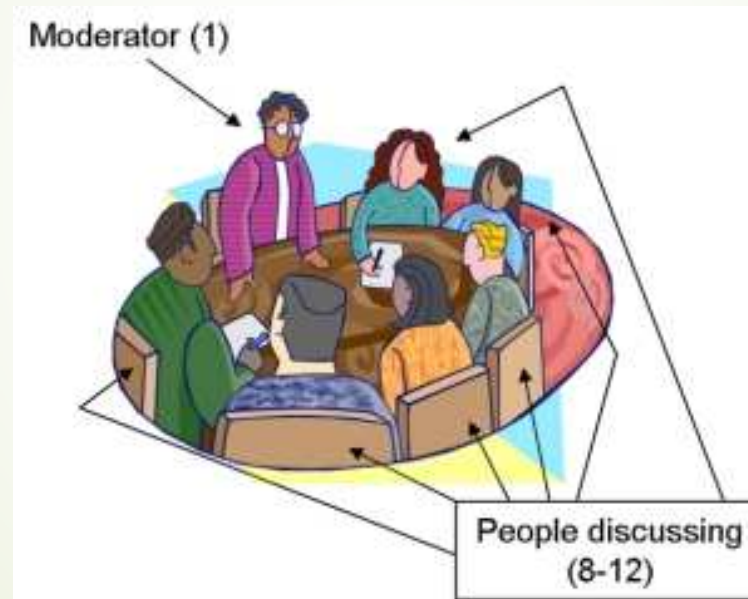
#2 Identify Goals

It's best to begin a brainstorming session by briefly stating an overview of the project. Even if everyone present is familiar with it, the refresher is a good way to get their brains in the right place. After stating what the project entails, clearly state the goal of the brainstorming session. Never go into a brainstorming session without a clear idea of what you want out of it, otherwise you're setting yourself up for a phenomenal waste of time.

S M A R T

Specific Measurable Attainable Relevant Time Based

Goals

#3 Set a Time Limit

Obviously, you'll have to end the brainstorming at some point. However, it may not always be the best idea to ideate until people simply stop talking. Try setting and announcing a firm time limit at the beginning of the session. The significance of the announcement is that it ensures everyone knows that the agreed upon goals must be met by a certain time. If you've got a strong team, this will encourage them to stay on track and really crank out as many ideas as possible within the allotted timeframe.
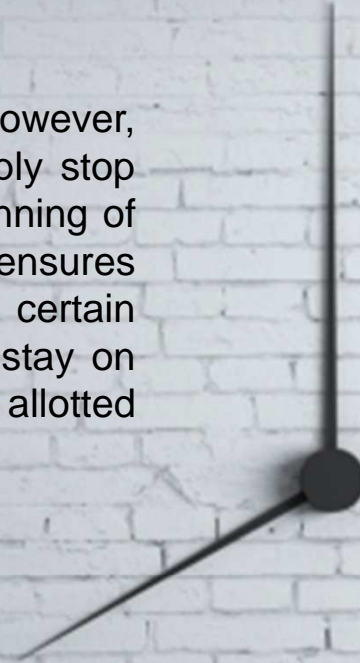
#4 Write Down and/or Sketch Everything

Be prepared at the start of the meeting with sketchpads, stickies, or a large amount of whiteboard space for everyone involved. Remember that every idea, good or bad should be briefly written or sketched out. Never imagine that you'll simply remember the important things that were said. Otherwise, three days later you'll be scratching your head trying to figure out how you could forget all those great ideas.

#5 Don't Judge

This concept might be a bit overstated but it is absolutely essential to effective brainstorming. At the beginning of the process you want to **shoot for quantity over quality**. Rather than taking five minutes to discuss reasons why a particular idea is bad or good, just take every idea and move along.
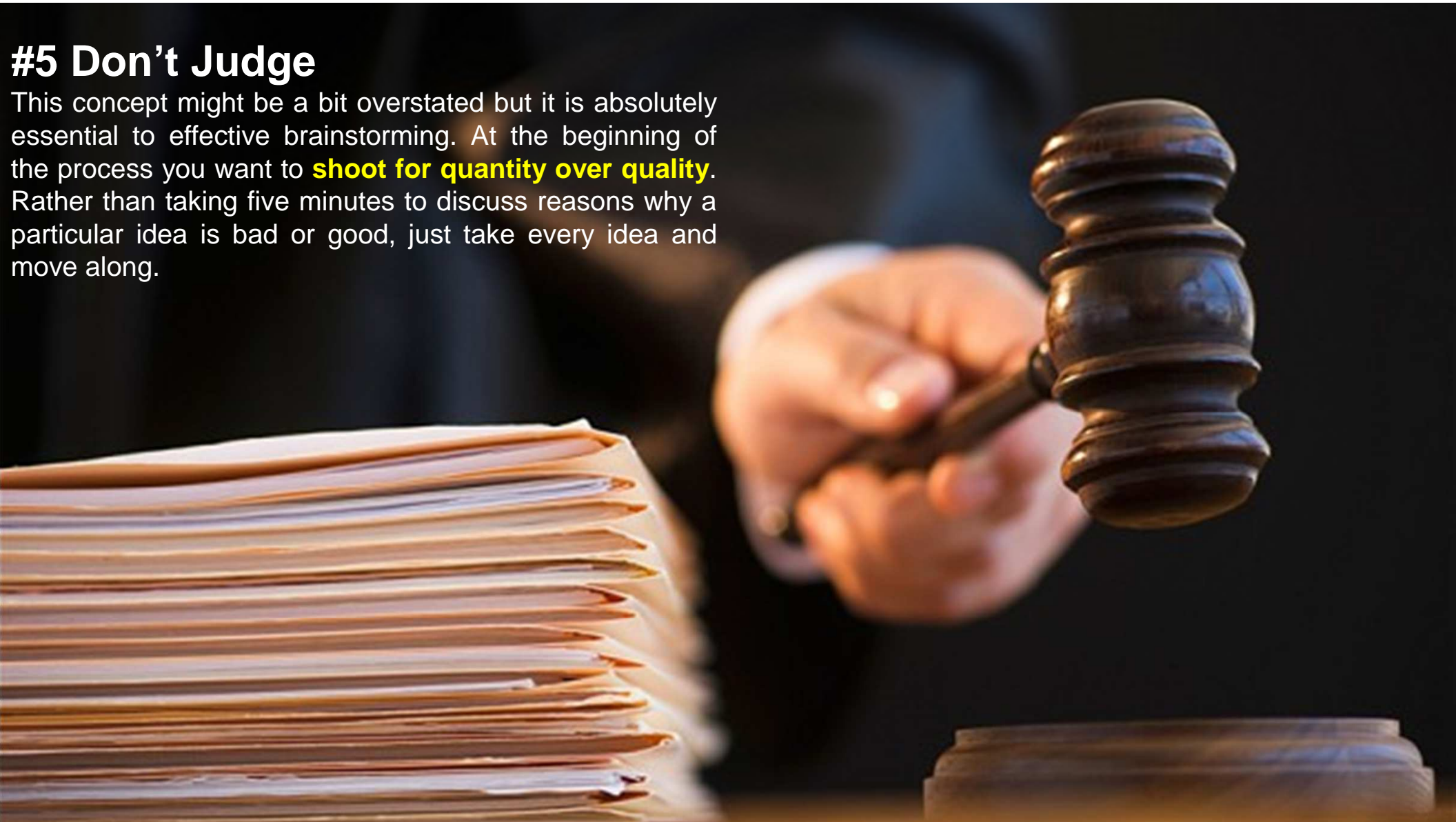
#6 Embrace the Ridiculous

If you really want to see the value of brainstorming, don't simply avoid judging unrealistic ideas, actually encourage them. As strange as it sounds, the very best ideas are often born from the very worst. Ask questions like, "what if money were no option?" or "what if our time table were three times as long?"

#7 Start General, End Specific

If you're the moderator of the brainstorming session, your job is to gently steer the conversation towards a productive output.
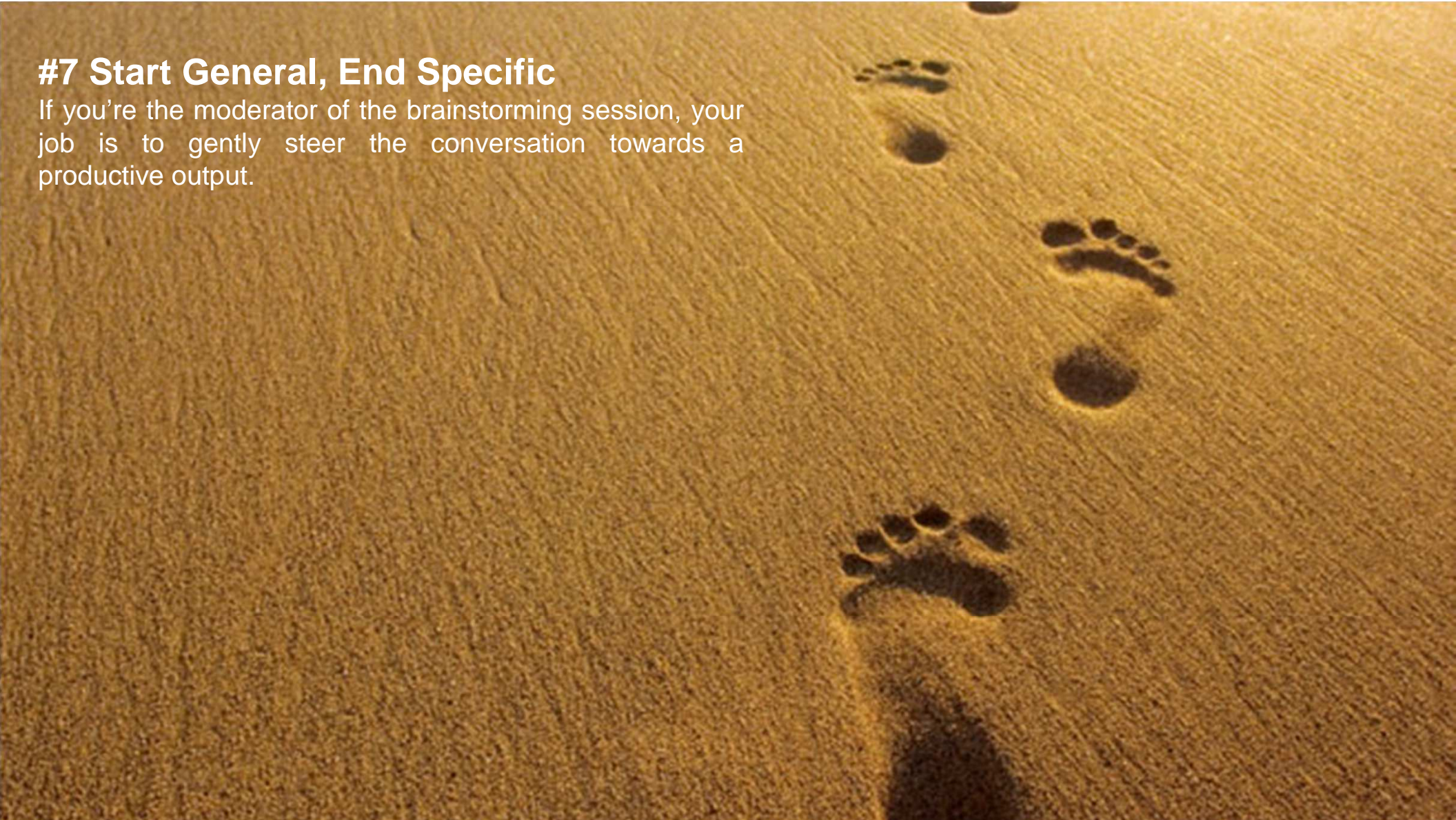
#8 Look for Synergy Potential

As you begin to trim your selection of ideas in the step above, beware of viewing the possibilities in black and white terms. It's not always the case that the furthering of one idea must mean the death of another. There is often potential for creating synergy among originally separate suggestions.

#9 Avoid Group Think

There's a fine line between a team that productively cooperates and one that suffers from too much cooperation. The moderator should watch intently for signs of group think and steer the conversation accordingly.

#10 Include an Outsider

final suggestion for effective brainstorming is to include at least one person in the group who doesn't belong. For instance, if you're working with a team of designers, try throwing in a developer to add some diversity to the mix. Or better yet, grab someone who knows absolutely nothing about creating websites or developing attractive user interfaces.

Design & Market

Product Development Process
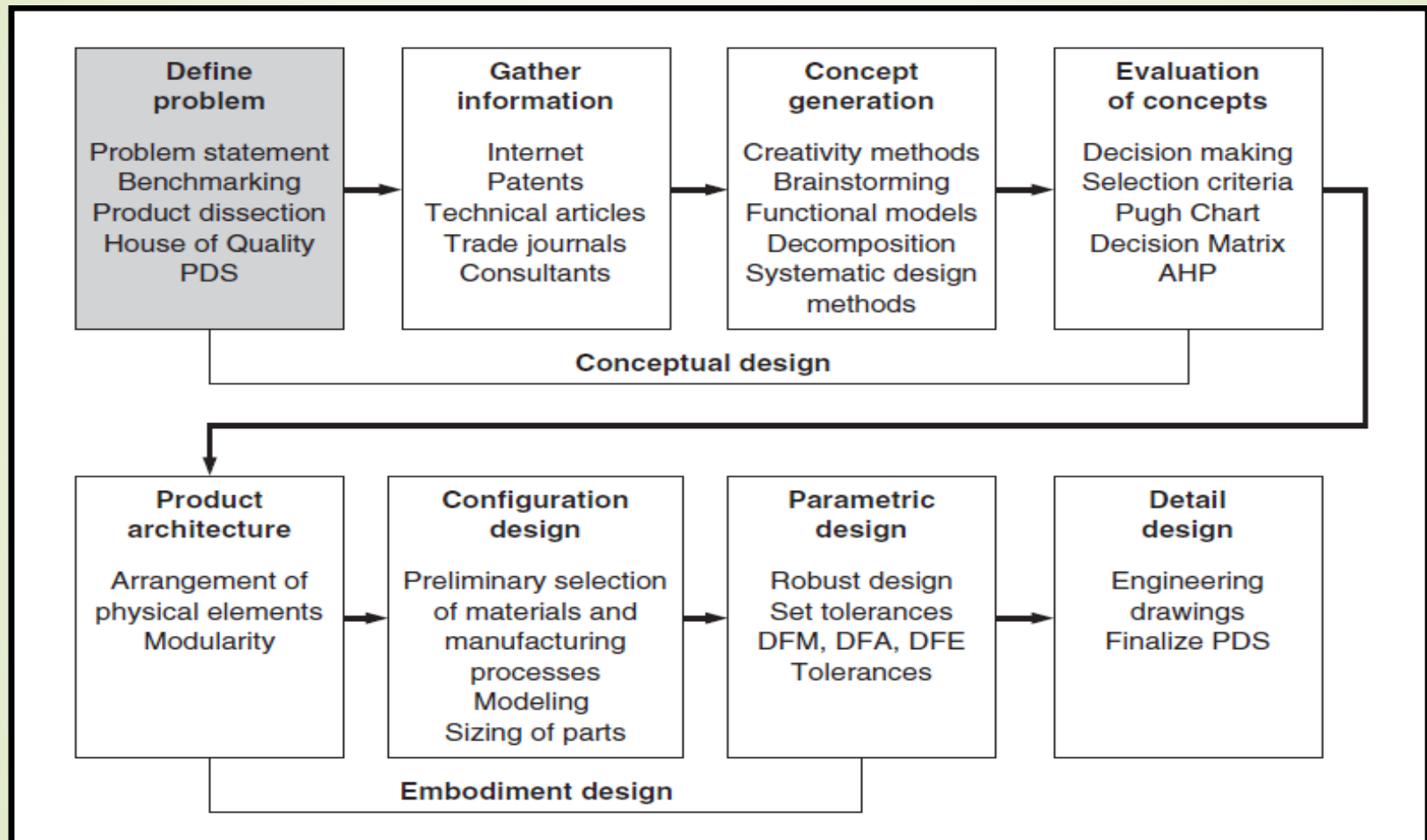
NEED IDENTIFICATION

➢ **Designing starts with need identification**

➢ **The need gap is to be identified by observer /user/organization.**

➢ **Designer has to meet needs of clients as well as users**

➢ **The need may be vague from user. Designer has to make it clear and specific:**
Problem Definition & Design goals

PROBLEM STATEMENT

Problem statement-

"Students need an easy way to take their books to school".

Now there is the need to define this problem a bit more in detail.

Who are the students?

What is meant by easy?

Make the problem definition as best as possible. Identify the Product attributes/functions and assign weightages.

PROBLEM STATEMENT

Formatting the Objective Tree
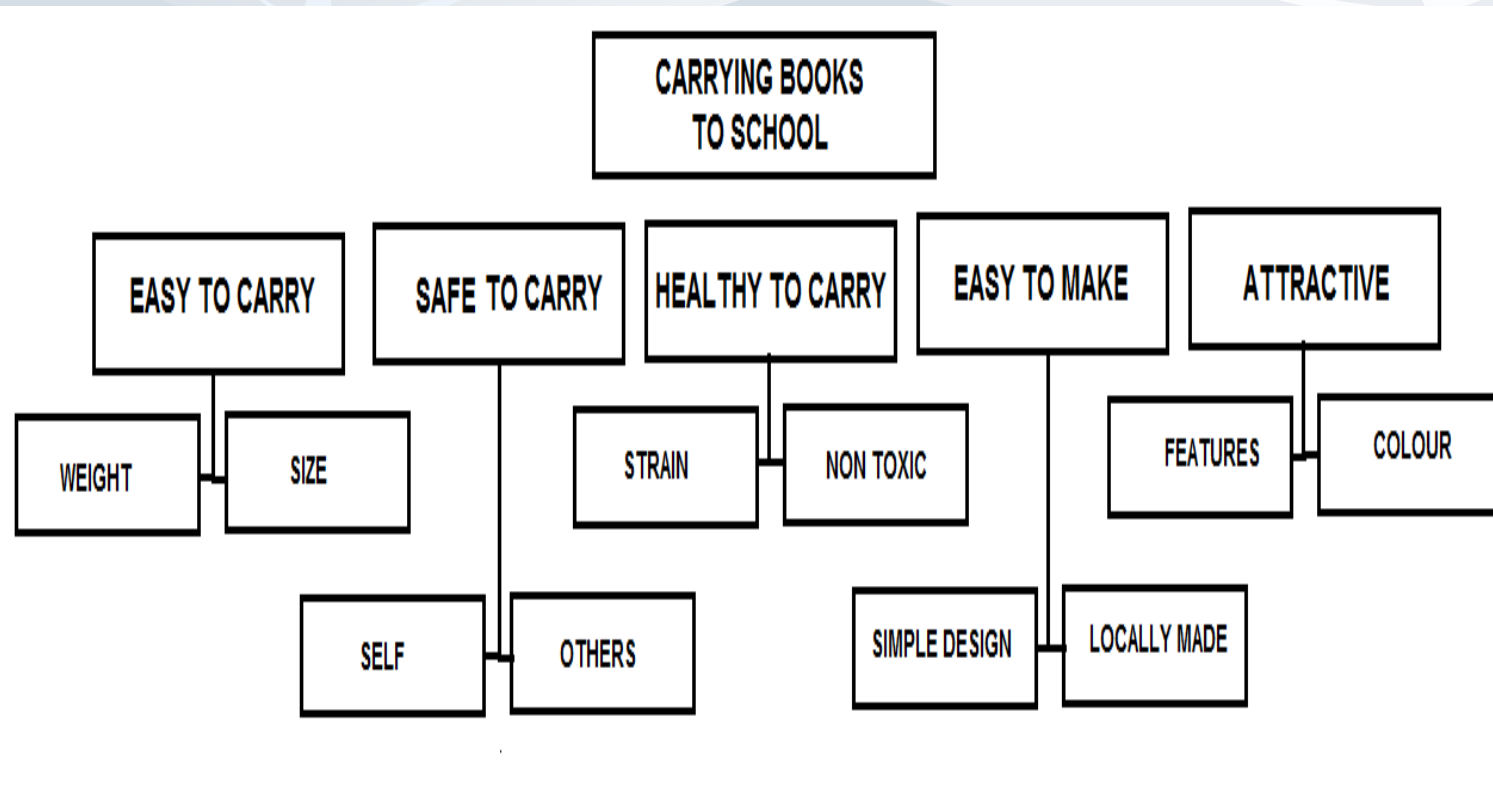
Market Survey

Entrepreneurs specialize at creating innovative ideas for new products and services, but **ideas that sound good on paper are not always good in practice**. Determining what consumers want and designing products and services that fulfil those wants is essential to the success of a business. Businesses use market surveys to gather information that aids in market research.
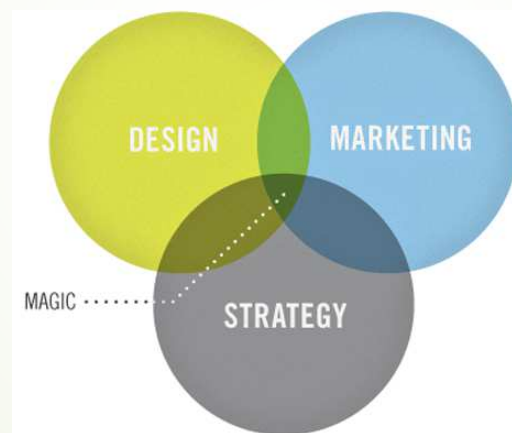
Market research describes the gathering and analysis of market data, such as consumer preferences, trends in market prices and the presence of competing products.

Why Market survey ?

❖Market surveys help businesses make better decisions about the types of products and services they offer
❖Provide business managers with insight about their target customers
❖Surveys can help entrepreneurs assess the viability of new ideas
❖Help to realise market interest for new products
❖Give ideas about competing products in market
❖Price fixing

Quantitative Market Survey is about getting the hard measures of a market - market share, how many people think... , how many people saw our advertising, how many people would buy

Qualitative Market Survey is about the softer issues exploring why people do things or think the way they do. These types of survey are usually complementary - you might explore the reasons why people buy in quality, then measure how important these reasons are in quant

Different types of Market Surveys

➡ **1 – Market Investigation Surveys**

What is the size and market share of the current market? Discover vital information about the growth of your market and where you stand against the competition

➡ **2 – Market & Customer Profiling Surveys**

Find out who your customers are…and also who are NOT your customers. Why are some people not customers of your service or product?

➡ **3 –Purchasing Tracking Surveys**

Find out more information about customers at various stages of the purchasing process and what is their opinions and experiences so far? With this information you can also find out if and when the customer may re-purchase your product or service.

➡ **4 – Customer Motivation Surveys**

What makes a customer go from hearing about a product or service, to being interested? And then, most importantly, what makes them go from being interested to actually purchasing? Customer motivation to move from interest in the product to actual purchase. Customer motivations is key to understanding customer purchases and loyalty.

➡ **5 – Customer Expectations (& Attitudes) Surveys**

Does your product or service meet your customer expectations? How do the attitudes formed by your customer about your product, service or company as a whole enable you to improve advertising, customer purchases and loyalty?

➡ 6 – Customer Retention Surveys

Explore the extent of consumer attitudes about your product, service or company. This is particularly poignant for any higher priced consumer goods or specialized service which required a lengthy decision and purchasing process.

➡ 7 – New Product Concept Analysis Surveys

Gather screening opinions and attitudes towards new product concepts. Discover potential consumers preferences, dislikes and chances or making a purchase if the concept was to take form.

➡ 8 – New Product Demand Surveys

Calculate approximately how much demand there is for new products or services.

➡ 9 – Habits and Uses Surveys

Understanding usage situations, including how, when, where and why the product is used.

➡ 10 – Product Fulfilment Surveys

Are expectations produced by advertising, packaging, and product appearance fulfilled?

Methods of Market Survey

❑ Offline questionnaire

❑ Online questionnaire

❑ Telephonic interview

❑ Direct interview with costumers

❑ Costumers feed back collection

❑ Obtaining sales data from executives and merchants

Market Plan

Market surveys helps to establish good marketing plan and it should contain following information's:

- ➡ Evaluation of market segments, with clear explanation of reasons for choosing the target market

- ➡ Identify competitive products

- ➡ Identify early product adopters

- ➡ Clear understanding of benefits of product to customers

- ➡ Estimation of the market size in terms of dollars and units sold, and market share

- ➡ Determine the breadth of the product line, and number of product variants

- ➡ Estimation of product life

- ➡ Determine the product volume/price relationships

- ➡ Complete financial plan including time to market, ten-year projection of costs and income

The Customer

"one that purchases a product or service"

"anyone who receives or uses what an individual or organization provides"

Customer is not always End User

The product under development defines the range of customers that a design team must consider. Remember that the term customer implies that the person is engaging in more than just a one-time transaction. Every great company strives to convert each new buyer into a customer for life by delivering quality products and services.

Performance

Performance deals with what the design should do when it is completed and in operation. Design teams do not blindly adopt the customer requirements set determined thus far. However, that set is the foundation used by the design team. factors may include requirements by internal customers or manufacturing or large retail distributors.

Quality

Quality is a complex characteristic with many aspects and definitions. A good definition of quality for the design team is the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs.

Elements of Quality

Features: Those characteristics that supplement a product's basic functions. Features are frequently used to customize or personalize a product to the customer's taste.

Reliability: The probability of a product failing or malfunctioning within a specified time period.

Durability: A measure of the amount of use one gets from a product before it breaks down and replacement is preferable to continued repair. Durability is a measure of product life. Durability and reliability are closely related.

Serviceability:

Serviceability: Ease and time to repair after breakdown. Other issues are courtesy and competence of repair personnel and cost and ease of repair.

Perceived quality: This dimension generally is associated with reputation. Advertising helps to develop this dimension of quality, but it is basically the quality of similar products previously produced by the manufacturer that influences reputation.

Cost

Cost pertains to all monetary aspects of the design. It is a paramount consideration of the design team. When all other customer requirements are roughly equal, cost determines most customers' buying decisions. From the design team's point of view, cost is a result of many design decisions and must often be used to make trade-offs among features and deadlines.

Conformance

The degree to which a product's design and operating characteristics meet both customer expectations and established standards. These standards include industry standards and safety and environmental standards.

Aesthetics & Ergonomics

How a product looks, feels, sounds, tastes, and smells. The customer response in this dimension is a matter of personal judgment and individual preference.

This area of design is chiefly the domain of the industrial designer, who is more an artist than an engineer. An important technical issue that affects aesthetics is ergonomics, how well the design fits the human user.
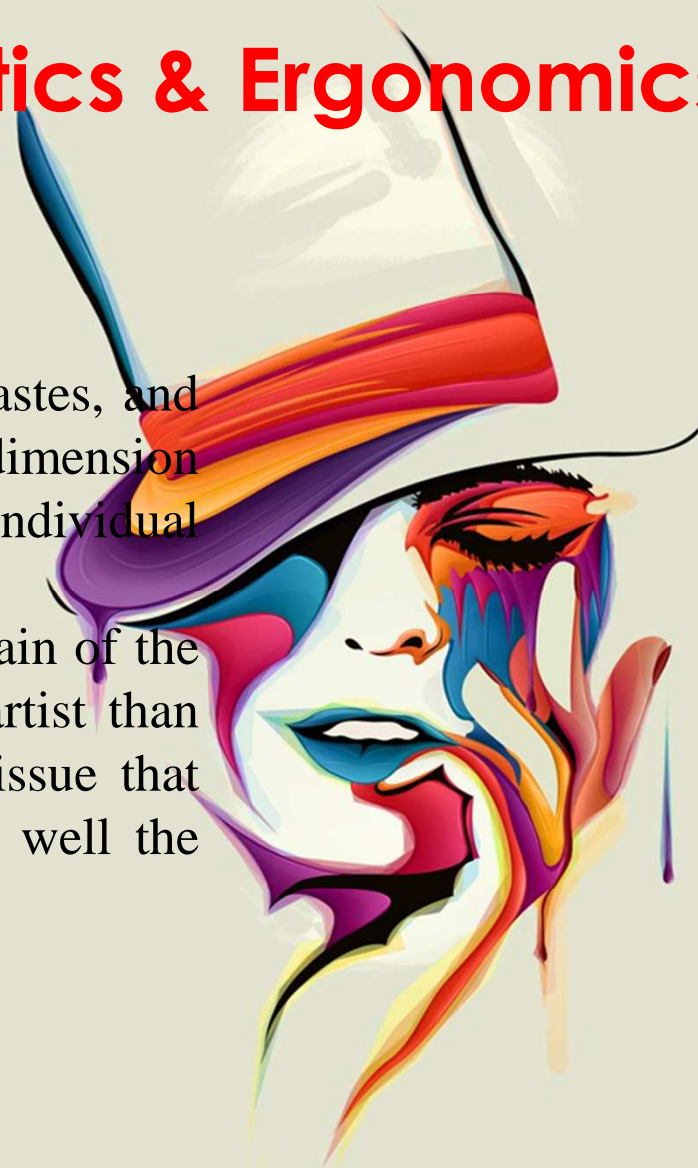
Types of Customer Requirements

Expecters:

These are the basic attributes that one would expect to see in the product, i.e., standard features. Expecters are frequently easy to measure and are used often in benchmarking.

Spokens:

These are the specifi c features that customers say they want in the product. Because the customer defines the product in terms of these attributes, the designer must be willing to provide them to satisfy the customer.

Unspokens:

These are product attributes the customer does not generally talk about, but they remain important to him or her. They cannot be ignored. They may be attributes the customer simply forgot to mention or was unwilling to talk about or simply does not realize he or she wants. It takes great skill on the part of the design team to identify the unspoken requirements.

Exciters:

Often called delighters, these are product features that make the product unique and distinguish it from the competition. Note that the absence of an exciter will not make customers unhappy, since they do not know what is missing

IDEATION

➢ **Process of generating ideas for a design solution.**

➢ **Ideation results in a large quantity of diverse solutions**

➢ **"Chance to have a good idea is more when there are several ideas than when number of ideas are few".**

➢ **It can be done by asking a structured set of questions.**

Example follows……..

1) What is wrong with it?

list all things that you feel are wrong with the present artifact

2) How can I improve it?

list all of the ways to improve the artifact, (forget feasibility)

3) Can it be modified?

E.g.: change, trim, shape, weight, sound, form, contours, etc.

4) Can it be magnified?

Make it larger, higher, longer, wider, heavier, or stronger.

5) Can it be Minified?

Make it smaller, shorter, narrower, lighter, subtract something

6) What if I reverse it?

Try a twist: opposites, upside down, turn around, rearrange

7) Can I simplify?

Make it easier, less work, simple to use, or quicker.

8) Can it be made safer?

What devices, properties, controls, or sensors, can be added to prevent injury, accident, explosion?

9) Can it be substituted?

What can take its place? Plastic for metal. Square for circle.

10) Can it have a new look?

Change the color/form/style: use a new package/new cover.

11) Can it be based on an old look?

Copy a period, antique, parallel a previous winner

Trade on "*They don't build them like that any more.*"

List out the customer requirements of a TV Remote.

ARRIVING AT A SOLUTION

Selecting the optimum solution from the large number of ideas generated

Feasibility of the design

CLOSING ON TO DESIGN NEEDS

Make sure the final artifact is meeting the design needs

Evaluation

Customer Feedback.

Redesigning

Activity: Suggest changes to the current design of product shown to add value to it

Juice box

Soap box