# Design Thinking With Chess Analogy

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# Abstract -

Many times, initiation of a good thing or new thing starts with the amalgamation of two things. The most beautiful recipes of food are often accidental Mixing of two unorthodox ingredients of cooking. For Concept? or For Ideation? The most Common collision place of thoughts is human brain. In my mind also, two things came across each other. They are the most beautiful things in my life. Number one is Design, what I am pursuing for my career and the second one is my favorite hobby- Playing chess. Yes, I thought that is there a relation in between these two. I didn't know at the beginning that my thoughts are childish, over ambitious or completely illogical. But to know a dish salty or sweet, you need to taste it first.  so, I took a Deep dive to see is it possible find out any relation of chess and design. But more important question was what will be the benefit of this study.  I tried to find out the opportunity where can I find out my deductions from chess. As chess very old strategic game, popular over the whole world, it has lot of tactics and strategies. I tried to understand basic chess tactics and use those strategies in design field. Next question was where to use the tactics? To select a domain where it can be used coherently, I searched for the design awards. The examples analyzed and selected for discussion, are all taken from IF design award 2021, product design. This selection made the domain almost homogeneous and easy for comparing. Though I believe it can be extrapolated for other domains like- packaging. Interaction design or web design.   After analysis of tactics, I made some cards of tactics for design and arrange two small seminars where I have described the uses of the cards and gave those cards to analyze the examples. So basically, the evaluation of the technique are 2 stages, firstly I made some cards from the tactics derived from chess strategies and used them to see how many examples are describable with my cards. Secondly Is it understandable to the other design engineers from different background and certainly not that much familiar with chess. Hardly they have known the rules. So their understanding and suggestion helped me to do further modification of the cards. I got some nice ideas about the evaluation of the process and applied that to the first Semester project to 4 different groups, who designed worked on the same product but advanced in different ways. So, is it possible to use the cards in this case study? I have added the study with my work in the final segment.

Pursuing for this Idea, and finally after completion of studying lot of examples, I found some really co-relation between the chess tactics and some of the widely renowned books in the discipline of design. The process of research was really a beautiful journey to learn lot of new things and fundamentally an exposure to be a better Design Engineer.

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# INTRODUCTION

# 1. Research Question: Is it possible to connect chess and design to solve some design problems or take decisions using the chess cards?

Actually my research question has 3 segments in it.  The first part is a general reaction after hearing my research topic.

## Why I think that chess and design are connected?

Is there any thing from any writing , any observation or its is an assumption from my analogy seeking mind. I obviously should talk about 1. my upbringing and chess- that will reveal my keenness for this relationship and the 2nd factor is the thinking process of both the discipline.

## How chess strategy or tactics  can be related to design?

To gain some advantages in chess some tricks are widely used like- fork, elemination of a defender, discovered check, deflection of a defender etc. How they are going to be used? The main rules of that tactics and their uses should be written on a card. For every tactics, or combonation of some tactics, there will be a card.The card will also have some design examples. The best application process of that card and requisites will be written on that **Card.**
The chess features will be translated to design features so that, Designer can use that card in different scenarios.
In Design Thinking we have certain stages of design. Mostly in ideate stage this cards can be use to check alternatives.  The SOP (standard operating proccedure) will be straight forward.

## What will be the benefit for design?

At the end of the development of cards, we will try to use the cards over a given set of examples,  and try to find out how many cards are used there or is it possible to explain the logic behind the  product. with a sample size more than 300 , we will see how many of them can be explained.
In Future design scenarios, these cards can be used to find out solutions for particular design problem, evaluate and analysis of the design and finding out alternative solution.

# 2. Who is the researcher & What is his Background?

## • Who am I?

My upbringing and Chess:  I was born and brought up in a town called Berhampur, in India. In most of the houses, the popular indoor games are ludo, carrom and chess. In India late-1990s and early 2000 decades, Chess was in trend Because of "Viswanathan Anand" – 5 times world champion. As a student we were always encouraged to play chess- As it is considered as one of the finest Brain exercises. During my Growing up age, I used to play chess a lot. Mini magnetic chess board is a travel companion to my family for each trip.

In my family My cousin Sister who is almost 15 years older than me, taught me how to play chess when I was only 5 years old. I liked the game very much. And I played with lot of my rel-atives who used to come to house, or in vacation where-ever we used to go I used to play with them. My maternal Grandfather at that time 65 years old retired person used to play with me (8 years old). Chess board is found in almost every house, and it's a very popular game. So, when-ever we had a half hour free time we used to play.

In my school and college days friendship bonds become very strong with those friends, with whom I used to play chess a lot. Chess was used to be our favorite pass time.
In 2013 Magnus Carlsen Beat Viswanathan Anand and become world champion which was played in India. From that time, I became very curious about the foreign players and came to know about some extra-ordinary personalities – Mikhail Tal, Gary Kasparov, Bobby Fisher. Their quotes on chess and life are very much thoughtful. So, the philosophy of chess was becoming greater and greater in my life. ease
In my 1st work experience to Bajaj Auto Ltd. I first time found a podium to play chess in competitive level. In the very 1st year, I got selected in top four of the core group of Bajaj Industrial Chess time. Here I met some of colleagues (later very close friends) who used idioms related to chess in other field (may be Personal life or work Life). Surprisingly, those are sometimes quite appropriate.

During an Interview, of National Institute of Design, one of my interviewers asked me "Why design fascinates You?". In a sudden Response I talked about the analogy of chess and design "That like chess, in Design also, there is no Best Design." (In chess it is said that there is no best Move, if you find a good move, look for a better one.) They appreciated my thought.

After that Design and chess started to amalgamate in my mind. Attacking and defensive strategies of chess and small tactics are useful to design. I found the analogy very often. Lot of examples comes to mind readily if I think of some situation. Default comparison of Design and Chess gave me the inspiration to forward in this direction.

In the last year only I started playing chess by opening my profile in chess.com and in one year, I have played over 10,000matches. And my winning percentiles is around 88 percentile in this year. I have no professional training and no previous experience of getting coached from any trainer. My chess.com profile Statistics are hereby attached with.

With time, my performances got improved. I learnt lot of thing. And its very evident that in this whole period I am very much regular and active. Surely I was keenly interested in chess before. But after deep diving into this topic, Someghow I got addicted to chess . Sometimes, I played chess not for sake of the enjoyment of playing,but to see peoples reaction in particular scenarios. Nevertheless- I should mention it is an awesome experience and beautiful journey. And I believe that it actually made me evolve in a better way.
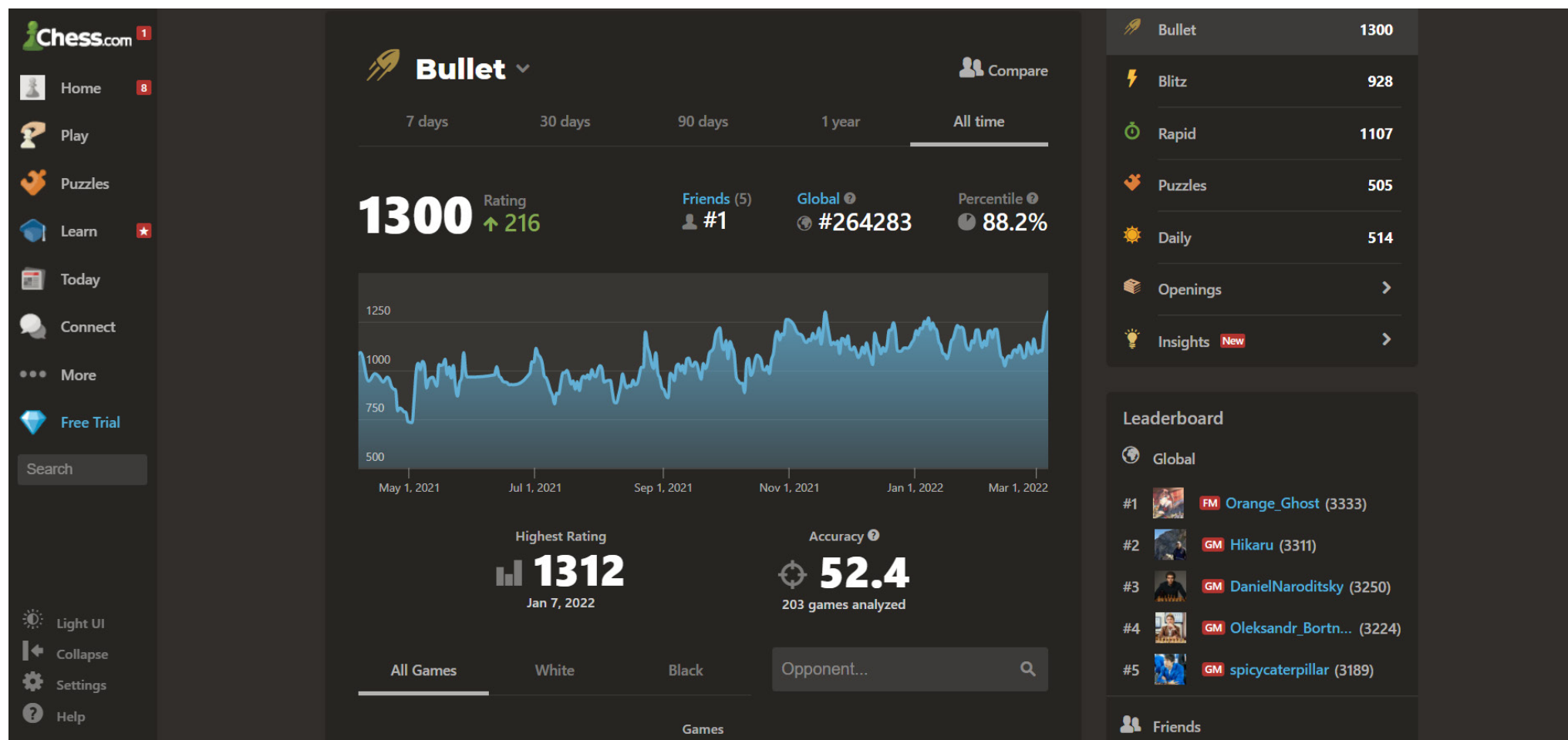
# Why Chess Is so Famous in India?

let's put some light why chess is famous in India. Why a third world country is emerged as a superpower of chess in the world. where there are multiple examples of sports which were fade way on-slaught of time.

chess is a indoor game which requires no field nor any installation in the room which is costly. For example for chess you just need a board and the pieces which is actually can be carried with you to any place. Unlike other games like table tennis badminton, or 8 ball pool or anything, it is mostly a cheap game from the economic perspective. So this is very interesting in India because from the economic perspective India is not a developed country.

The second point in this game you can play with mostly to any type of opponent. For example, in our culture of India, we did not learn chess with any grandmaster or any coaching class. Mostly it was taught by father, mother, uncle, aunt, cousin or friend. Basically, I learnt it from my aunt and cousin sister who is quite elder than me. So, you never have a scarcity of player in your surroundings.

 Thirdly, Chess is not a game which is a distraction or harmful to your studies. Basically when you go to play a game which is body sport like soccer, basketball or cricket, you do have a lot chance to harm yourself and also to fall sick for a month. Which is not intended for a student from their parents perspective, So instead of giving inspiration mostly parents stop most of their child from playing body sports. While if a child plays something like chess, it has been always encouraged.

Fourthly, there was a genius Called Viswanathan Anand, who is 5 times chess world champion. And he put to an end against the Russian monopoly of Kasparov and Anatoly Karpov, years of chess reign. Anand's name is so popular is so famous, that every child has nicknamed Anand after him jokingly, if he plays good chess.

Particularly NIIT the company who was introducing chess to most of the states of our country, took Anand as their Brand ambassador.  Computer literacy was a revolution for the education system in my early age. And we don't have computer in most of our houses. There are Cyber cafes which tries to propagate the computer education, almost all have Anand's large posters in every wall. So, even if you don't know how to play chess you get familiar with his face. Out curiosity you get to know about the sport.

There are lot of simul game organized ion the schools or districts where he used to play simultaneously with multiple children who topped in chess in their respective event so to be the centre of attraction of those events children sometime focuses to chess for a while. The inspiration was so big that right now India is the third superpower in chess. In total India has 73 Grandmasters, 18-woman Grandmasters in total.

Vishy Anand won the world championship For 5 Times.
2002 he became the firsttime world Champion. 21 monthes
he was the undisputed world No 1. he was actually the brand
ambassador of many Companies.
Amul, Horlicks, Memory Power and NIIT there are lot of
brands which had a target market of teenagers made tie up
with Vishy as brand ambassador.
So, from chess icon he became a national icon who we look
forward as a young genereation.
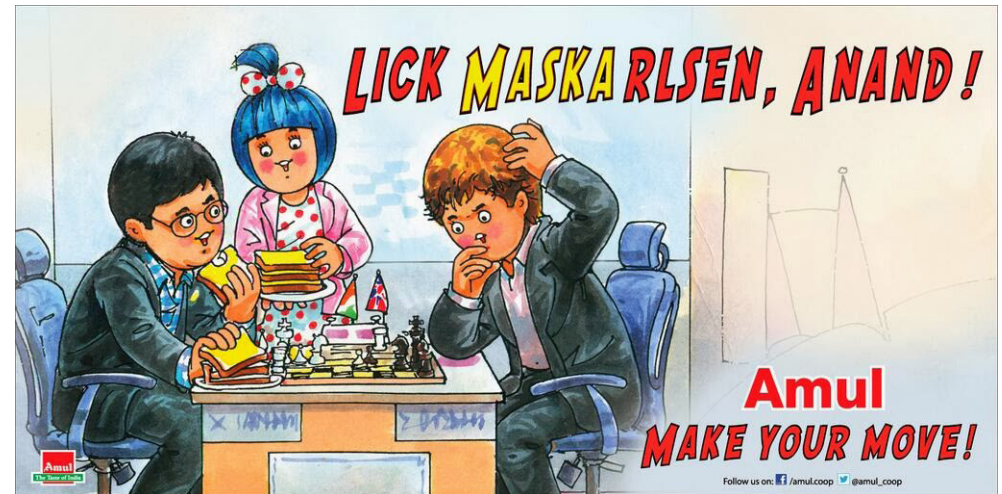
Advertisements were really creative. And those advertisement connected
the children with the young players mostly the students. Anand had a mass
connectivity with youth.
During lockdown the youstreamers are getting hit. there is chess streamer
named Samay Raina popularised chess the most , who is by profession a
stand up comedian.
The brands like Milk shakti, Amul or Horlicks promoted nutrition as a
main ingredient of intellectual power, Intellectual world, the scientist or
doctors or other highly reputed professionals are not popular among the
children. Sportsperson are symbolized as a stereotyped more as a physically
excellence acheiver. So naturally the symbol of intellegence, sharp memory
power, wisdom were directlly used to connect with Anand and if we ex-
trapolate it it was connected to Chess,

# PART -1 .LOOKING FOR A RELATIONSHIP OF DESIGN STRATEGES AND CHESS TACTICS.

# 3. What is the present Relationship between Design & Chess?

## 3.1The state of Art- Chess and Design

When I started to look at about any previous work or reference where design or chess have been compared together or not. I came across some of the blogs which talks about the designers not about the Design. How chews can evolve the personality of their designer and make them a quality designer, the article gives a nice overview on that.

 in the article chess has been described as a Mind Sharpener. And in lockdown it has been become a more popular game in all over the world,

 In the article it was mentioned that though most of the people who are not much aware about chess they think about calculation and very strenuous job to do. But actually, is an amalgamation of two right brain and left-brain activity.  the beauty of playing chess is considered as a sheer art.

Now in article it has been talked about Critical thinking, in the domain of design which is mostly called as Design thinking.

"Design thinking is essentially the process designers use to understand users, challenge assumptions, redefine problems and create innovative solutions. Critical thinking is actively analysing and understanding problem statements to arrive at the optimal solution.

An interesting article by Think Design talks about how critical thinking is a part of every stage of the Design Thinking process. Essentially, effective Design Thinking cannot take place in the absence of critical or creative thinking.

While playing chess, you're trained to think about how a single move impacts the rest of your game. You need to anticipate your opponent's response and also think about whether your pieces are improving your overall position in the game. This constant train of thought plays out for every move in the game and develops your mental strength to iteratively think out several moves ahead.

Foresight is an integral quality for a Product Designer- to predict both what will resonate with users and how the change impacts the product. Before making any change, try to incorporate critical thinking to make better choices.

1.	Anticipating their moves: What will a user think while using this feature? Will they be able to transition to this new feature easily? What are the possible hurdles that users/products can face if I incorporate this feature?

2.	Improve Position: Does this improve the overall experience of the product? Does this add business value? Does this solve a problem? Does it help solve a short term or long-term problem?"

 Not only that the Problem-Solving aspect of design and Chess is also very comparable.

In infinite probability is always improving your position. Even when the player is clearly in advantage there are possibilities to win the game in two or three moves, if the player fails to find the move it might taker lot of time to Win the game. In chess the understanding of your opponent's new target or strategy makes you alert and a better observer of small changes. the game of chess in cultivate the ability of visualize a lot. Players who are professionally in this field can play chess blindfolded. Accurately they remember positions and all the previous moves which helps to build up the visualization process in an exponential way.

 Not only that chess also improves the ability of back calculation. one way of exploring is if my knight is in D4 what the squares are it can go, and how will I get benefit from that. while lot of times we see in chess the reverse way also works fine like if I can bring my bishop to F3 square the king is mate. So, find out how to bring a bishop to F3 square.

In the article the author has mentioned Visualization as the best friend of a designer.  I believe in that.

In another article published in Viget Blog, some other aspects has been shown in the relationship of chess and design.
Futureproofing
In chess the Player needs to calculate His and his opponent's response both simultaneously.  the responsive movement of pieces helps a huge quality
for the designer. from the first prototype to the first production there are lot of iteration goes in the design, development and manufacturing process. If A design
keeps the response virtually in his system automatically the number of steps is reduced. Which saves lot of time and a huge amount of money.
this article also talks about near infinite possibilities, what is discussed previously.

"Building resilience
According to Brooklyn-based chess teacher Elizabeth Spiegel, chess "teaches a certain resilience. No matter how good you get as a chess player, you're going to
get in bad positions. And you have to deal with them, you can't just give up when you have them."

This happens all the time in the design process. You're going to face opposition down the road and part of the job is dealing with struggle. Mindy has said it best:
"We need to deal with those failures the right way so we can continue to push boundaries."

Strengthening concentration
In a game like chess, you're forced to constantly survey the situation. Several actions are taking place all at once during a chess game, generally against the clock
too:

- Predicting your opponent's future moves
- Responding to your opponent's last move
- Planning your future attacks / defenses
- Solving the main objective: getting your opponent into checkmate."
All these qualities are essential for a designer. And this actually gives a very Subjective description that why chess can be a beneficial game for the designers.
 but in a very objective sense i was still looking for a domain where chess strategies are categorically helping a professional field.
 I found two very promising domain where chess has been studied as a part of strategy making.

1. MIP POLITECNICO DI MILANO, The Business School made a curriculum for the MBA  Students, who can learn strategies from chess.  It is a dedicated
course to the people who actually wants to improve their Strategic Thinking and entrepreneurship mentality.
Luca Desiata, an Engineer and renowned Strategy maker, MBA graduate from Insead, has published the Italian version of chess and corporate strategy in 2012
with worlds one of the greatest chess player Anatoly Karpov. he is the director of this course.
main objective of training was
> Improve strategic thinking and decision-making skills
> Improve negotiation skills
> A better understanding of the founding
traits of leadership, based on chess
champions' experiences

Tools that are acquired by the end of the
course:
> Artificial Intelligence vs. Human Strategic
Thinking
> Decision-making theory
> Game Theory and Negotiations
> The founding traits of Leadership, based
on Chess Champions' Experiences
> Military Strategies for Business

This is an excellent example I found for business and Artficial Intelligence domain. there are some books also where Artficial Intelligence and Chess rela-
tion ship has been discussed.
One of the example is-
Chess Metaphors : Artificial Intelligence and the Human Mind
by Diego Rasskin-Gutman , and Deborah Klosky
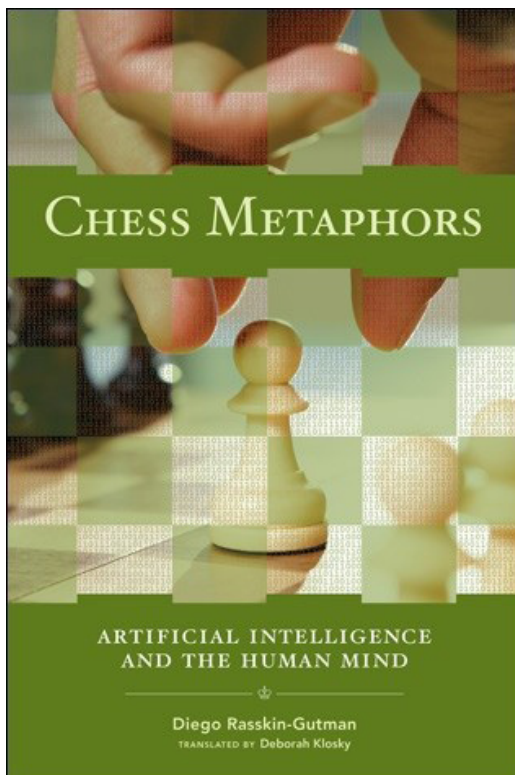
this book deals with the metaphors, how the human brain is work as a metaphor maker and the Human mind
is the world of metaphor. It has also discussed about who are essentially the chess player. But the most im-
portant discussion for our discussion is the chess heuristics and the research. Here t It has been beautifully
potrayed that Chess is a part of Science paradigm . Simultaneously it also involves an artistic mindset which
drives most of the creative side of a human being.
the analogies and the inferences described here are very much usful and also valid for chess. So I am men-
tioning about the book here though it does not have much to directly connect with Design.

Perrsonal aspects, mind set development or habit building are indirect aspects of corelating chess and de-
sign. but in my case i want to Directly try to apply the techniques of chess satateges as cards Which will be
useful for designers.
Mostly the aspects which will be benefited with this cards are Define and Ideation stage. My goal into design
with the glasses of chess and to see is vision multiplied or not.

CHESS METAPHORS

ARTIFICIAL INTELLIGENCE
AND THE HUMAN MIND

Diego Rasskin-Gutman
TRANSLATED BY Deborah Klosky

## 3.2 Similarities of Chess and Design

Chess and design have certain similarities from the aspect of taking decisions

- Everchanging Scenarios: A move is made according to the whole dynamics of the chess board. And it's expected to understand objective of the opponent's move and react to that. But the move is not only the reaction to opponents move, but also planning from your side to attack. In design also the context is ever changing. Here designers not only look at the problem and solution. The customer, market and other stake holders' point of view is also important.
- Cumulative effect: every move has a constant repercussion on the board. Basically, effects of moves are always added on to the previous situation. Design field also has the similar cumulative effect of all features and processes
- Amalgamation of Mathematics and Art: if we closely see chess… chess is a game of coordinates where all squares have name like a1, a2…. e4, g7……h8etc. but the game is played in a method where some pieces are having some directional rules to attack, and king needs to be protected. It is complete amalgamation of artistic sense and calculative thinking. The similar type of blending of science and art is also shown in de-sign also. Paradigm of science and art are mixed in design.
- Not necessarily higher point wins the game: in the game who scores higher point does not win the game. The game rule is to checkmate the opponent's king.
- Controlling squares: more squares give advantages to the piece moving. In design al-so generally if a product has a better opportunity to be successful if it connected to a greater number of audiences.
- Understanding of understanding: if someone finds out the motive behind the opponents moves, it will be lot easier to take decisions for his move.
- There is no best move: there is nothing best in chess. Same in design, there is no best design. Even the most successful designs are evolving with time.

# 4. How chess is played?

Chess is a strategic game where two opponents play against each other, in a 64 square where 16 pieces of white and Black play against each other. The main aim of the game is to capture opponent's king. To win the match, king be trapped by opponents' pieces, including his own square. But it is the final intention to win the match. But during the match players try to gain material or positional advantage.

To understand the material advantage , we need to  understand the system of value of the pieces.

| Pieces and Point Value | | |
|---|---|---|
| Pawn | ♟ | 1 |
| Knight | ♞ | 3 |
| Bishop | ♝ | 3 |
| Rook | ♜ | 5 |
| Queen | ♛ | 9 |
| King | ♚ | priceless |

Mostly the game is played in a manner where each players try to retain his own points and the opponents' maximum points needs to be destroyed. The greater number of pieces the player takes to the attack the attacks become stronger. On the other hand, if the player gets attacked by the opponent, he tries to bring more no of pieces who can actively defend the king.

The game played mainly in three segments,

The beginning- The beginning is developed for the players for huge no of years.  According to Oxford Companion, 1317 type named openings and variants. if a player follows this it is called as book moves or book opening. Some of them are call Sicilian Defense or many be Sicilian dragon, Queen pawn opening or Bong cloud chess opening.

what people does when they starts opening. the first 5/ 10 moves are roughly considered as the opening moves in chess. Mostly the player tries on opening out their all pieces, mostly bishop and Knight and make most spaces to move them over the board. One objective is to stop the opponent players to enter the main territory their side.

Along with that there are many other things to look after.

Firstly, in there any active threats for any pieces. If any piece is in the radar of the opponent piece, then the in danger piece can be captured. So, location to remove the piece from the danger location to a safer position.

Then one needs to find out where the opportunity to attack the opponent. if any player finds out some pieces which are not protected , you can go for killing it. May be all pieces are defended then to attack one need to find some weak squares. the squares are not guared by opponents and from those more places can be controlled. In general the pieces tries to controll the center squares of the board. And then looking into The opponents piece, one needs to identify that which pieces can be converted to free pieces or make something so that some pieces can be trapped so that they actually get completely ineffective. in the middle game mostly the tactics and strategy comes into play. There are particularly stratregies to attack multiple pieces together, sometimes create a trap where a very effective piece get trapped, block some the pieces, sometimes sacrifice for greater good.

The end game is also very interesting, which actually deals in checkmating the opponent. there are many types of checkmates like back rank or weak back rank check mates. the fundameentals principles of them are really simplistic but their master class execution is really artistic. but in total we can look into

some thumb rules and try to understand the simple games.

# Thumb rules of Chess:-

Chess is played with some thumb rules –
1. Protect your own pieces.
2. Attack opponents un-protected pieces.
3. Exchange pieces when the exchange process is profitable.

Standard Chess game is played in three phases, Opening, Middlegame and Endgame.
During opening it is suggested that

- All piece's should be developed.
- Pieces should have more place to move.
- Control the center and try to control as many squares as possible.

As the game increases the process of playing the game is depends upon tactics and finding opportunities.

# 5.What is Design Thinking?

## 5.1  Design Thinking for different professionals and debate

Design Thinking is not a very easy thing to describe because of two reasons,
TIM BROWN, who is the CEO of the IDEO and the author of the book "Change by Design, how Design Thinking Transforms Organizations and Inspires Innovation." did not provide any exact definition of design thinking.
Secondly it has a long history of design, Mr. Brown did not coin the term called, "Design Thinking". Rylander (2009) has noted, Design and Thinking are difficult enough term to make sense alone.
The defining process of design thinking can be explained as the Thinking like A designer. How designers think is not a black and white simple definition. The designers are not only one who professionals who uses design thinking. The Design Thinking is also used by the Business Analysist, Strategy makers. That's why design thinking is no more a discipline only for designers, Several business schools are also taking Design thinking as thinking as their curricular activity.
IN BROWN's words,
 " A discipline that uses the designers sensibility and methods to match peoples needs with what is technologically feasible and viable business strategy can convert customer value and market opportunity"
Basically design Thinking opens up a conflict that is it a mono disciplinary subject or it does not have such boundaries. CROSS, one of the most prominent scholars in research coined a phrase of Designerly way of knowing things. In a classical way designer is connected to the discipline which a directly in contact for example the engineering knowledge that relates to the design. Industrial design which gives the relevant knowledge to make a product. But apart from this thing, there are lot of other things which guides the designer to make the product. For example, how people find the meaning of the product, or which market to penetrate for which economic class. In the path of evolution design thinking takes lot of path , which is sometime little complex and sometimes little inconsistence. Multidisciplinary concept of Design Thinking is massive in context but it is used as a tool in business managerial issues little bit undermining the creative part of the subject.
In a shorter version of defining design thinking, we can say that it's a pivotal tool which is used by different professionals to solve different problems. Sometimes the business personnel or the marketing people use this tool neglecting the creative side of design thinking.
Design thinking helps in two scenarios to solve the problems one is 1. Reflection in action the 2nd one isw reflection on Action. The basic deference of these two situations is the method of looking at the problem. In the 1st case designers uses their prior knowledge or experience to solve the problem, whereas the designer anticipates the futuristic problem and then uses their prior knowledge to solve them. Both the cases the Previous knowledge which is acquired from experience is very important. The previous knowledge comes from different cases.

## 5.2 Creation of knowledge

Sometimes people make a synchronized data where two information's are related and dependent each other then we can deduct third information from the previous two information. Red color has highest wavelength, and it can be seen from the longest among all colors. To make a danger we need something that can be visible from long distance. So, the deduction is we can use the red colour as a danger symbol. This process is often used in scientific subjects also. Design thinking makes this type of deductive knowledge.

Design thinking also uses an inductive knowledge also. Inductive knowledge is something where we can use our prior experience and the connect it through another context like. Red colour is used in traffic stop signal, or danger symbol…. So, to design a machine emergency stop button is designed in red color.

The other kind of knowledge generation is Abduction. Abduction is back track method of knowledge generation. In case firstly people take some already known result. Then guess what the previously used methods can be to reach to this conclusion. Here the process of guessing is not very simple, but this is a unique method of knowledge generation method. In abduction Method if we get some good results we can verify this method with other examples, the more it is verified, it becomes more reliable.

The process of generation this knowledge is not a simplistic straight forward method. Sometimes the method of creating this knowledge intersects and each other. Designers creates different way to make the design process. Often the whole process is iterative and depends upon the persons capability of using the prior knowledge.

## 5.3 Human centered Approach

There are different approaches which are used in design thinking.one of the popular way is HUMAN CENTERED APPROACH.

Mostly the products are designed for human being. During the design procedure, the design keeps his focus on the user's mindset, their social background, ethnographies, cultural concepts. Firstly designer/ design researcher makes design research where he gathers the relevant data for users. real people are involved in this research process. After the research the data is categorized and made it useful for design. Secondly this data is used research data to drive the design solution. (Friess , 2010, p41).

Design Thinking plays a huge role in both cases. In this complex process of gathering the data of the users and the utilizations of it. In design practice people make a particular process of doing these stages. The whole process is mainly divided in three stages. Three Stages are –

1.Approach- Nature of Research- the Approach is the highest level of the Design where the perspective to the problem is decided. How to tackle the problem. How the product is going to connect with the audience.  Like a product is coffee Machine is going to be designed. There can be different ways to introduce the coffee machine in the market. Let's say for example, it can be said that this coffee machine prepares quickest coffee to your table. The second one maybe it is the cheapest but very durable coffee machine available in the market. Third one can be the coffee machine is the artefact of your office ort kitchen. It can be a specialized for masking coffee for a specific location or specific country.  Or it might have the easiest interphase to make the coffee. The coffee machine is going to serve a purpose. It can be  giving a solution to existing problem. It can make the processes easy.

2. Method- The main goal of design is to conceive and develop products for serial production with contemporary technologies. The contemporary technologies and the designer's expertise to implement that are two fundamental factors of process. Previously the the designers used to design based on whatever they have as available technology. So, mostly it was a technology which drives the innovation. But after a severe advancement of technology now designers can pick and choose what type of technology they want to use and how much advanced technology they will include in their product. So, this is a designers intuition what helps to build up the product (Friess 2010). As we have discussed that HCD users methods are connected with the ethnography, socio economic behaviour, but there is another angle that is connected to the products design success. That part is the emotion of the user. When emotion is a factor for the product development then only the scientific methods are enough to track the process of design.

And in this situation design need methods to borrow from the social sciences. There are several methods are inspired from the methods of social sciences. In my research I am trying to make an analogy of chess and design. So that I can borrow some process from chess tactics and chess strategy.

Design specific methods are very wide and varied as far as process is concerned. Mainly the HCD methods are categorized in different segments, - 3 main segments are Traditional Adapted and Innovative.

Among traditional one – comes market research, focus groups, surveys, questionnaires, Interviews, trace methods and experiments. These methods are old, reliable in most of the cases and pretty much straight forward mostly people Designer use this when goals are visible and clear. For example - questionnaires and interviews, mostly it is needed to clear in the mind of the user that, he / she knows the answer to the question coming in the interview. But it is not always that easy, the experience or the product form the user is looking for may not be clear in their mind. In those scenarios the second HCD methods comes into play

Adapted methods, for example the are methods adapted from Observational research, ethnographic Methods or HCI. Participant observation, still, video documentation, video ethnography, beeper study, experimental sampling, cultural inventory, artifact analysis, think aloud protocol, heuristic evaluations … etc.

There are a third category of methods called as Innovative methods where the user information and its usage are created and executed very creatively. The methods are those created by design researchers to gain useful insights into the design issue at hand. There is different category of people who are closely connected with the design process, manufactured of the product, user, retailer, transport, even the bystanders all are having stake in the design process, so they are called as stake holders. To include all the stake holders and and their interests in the process designer's user to use some tools to gather data. This data gives a direct informative view without any kind of translation

Hanington divides this Design process into 3 subcategories 1. Explore, 2. Generate and 3. Evaluate

Exploratory research work is basically consisting of Design ethnography, contextual enquiry, and cultural probes, mainly this are adaptive.

While generative methods are  having their focus on making the product.  Generative kit, participatory design and co design are some examples of Generate.

The generate process have two big segments one is the projective part and another one is the constructive part this constructive part have a concept ideation process. This ideation processes.  This ideation process goes through a journey where we need take decision that which way, we are going to solve the problem or what will be feature included to the product. In a huge, in more accurate saying, in a complex product there are lot of functions. Which function needs to be included or how that function will work is a big question for the designer.

In present scenario, may be a good example in this process is the IDEO tool kit, Ideo tool kit have some cards, these cards are used for ideation, implementation and inspiration of Design.

Mostly the cards give a very wide view of the process, the procedures of using the cards takes 30min to 1 hr depending upon cases.  Difficulty level of the cards are also very wide. the complexity of the cards demands at least half an hour to understand and use the card. Mostly the cards are derived from the existing practice.

In the case of chess inspired cards, the cards will be mostly of same difficulty level, they are dedicated to product design. The method of using the cards will be simple.

The Goals of the cards are-

1. Easy Ideation (IDEATION STAGE)
2.Quick to use, lesser time to understand.
3. Standard operation procedure dedicated to product design.
4. Help the less experienced person in Design.

# 6. What is Methodology Behind the Cards?

## 6.1 How chess tactics help in chess?

I used to play chess with my friends and sometimes in online portal like chess.com. I have suddenly come across some new vloggers and streamers who increased the Eagerness in my mind for chess. I in 2020 end and 2021 starting, increased a lot. I suddenly noticed that I have making same mistakes or sometimes I am getting some intuition to find some common tricks to defeat my opponents, the things are nothing new, but I want to understand why this is happening. I tried to find some pattern. I started to play some quick matches and the thing were coming very evident when I played a huge no number of matches based on intuition. I started playing matches which are bullets. In bullets the match time is 1 minutes. In these matches I need to play fast, which makes the game much more instant. So, the pattern becomes evident. Some of the tricks were useful and I found they are very often used in particular situation.

For example,
I try to checkmate my opponent with a trick called battery. In this case during the initial stage of the match when the game is still in t6hre building stage I kill a pawn adjacent to king is killed by the queen or powerful piece who can either checkmate the king. And the king has the power to kill it, but some other piece like bishop or knight is supporting it from behind. This trick is very useful. In lot of situations, I used this trick to kill a piece or gain some material advantage.  but I realized that this type of trick is used in some position. And with more matches I played I started to recognize more pattern. There are seven, eight types of tricks are useful for me. After some research i found that these types of tricks are used in chess for, long time by grandmasters. There is huge study behind this.

Why these tricks are so useful?

Why learning chess tricks are important for me...

1. It gives an idea to understand in which direction, the game is going to be played. Brings the game in a known position.

2. In the matches there is clock, if you already know the trick you can save the time.

3. If you reach to a certain position, you know how to win the game. So, it shortens the path of success.

4.  Not only winning, but also the opponents trick you can understand. So, you understand what type of lure or opponents trap you should avoid.

   While I was thinking of these   tricks, i understood that it can be also applied in design. In design field also there are a plenty of examples where designers have choosen some particular method to solve a problem, make a product cheaper or make their product stand out from the other products. So I thought, there can be some similarity of  decisions Designers took for deciding the feature, functionality or aesthetics.

 So tried to compare how I can channelize the  these two streams together. While Designing designers makes decision about each on every features of the product looking at the impact of that on every thing like, the other features of the product,  external issues or problems it is solving, more connectivity or ap- proachability to the coustomer or other stake holders. The process of conecting chess and design i tried to  make all the components of chess  convert to design components.

**The Chessboard-** the chess board is the design field, where all the features and the problems and  issues are moving. So basically the when one feature is designed the design place automatically changed. So the next design advancement is the response of the change in the board.  lets take an exasmple of  present day  situation. For example the New charging station of electrical vehicles are  product we are considering about. Now recently with covid the huge amount change is noticed. So the domain of the Ev charging  the chess board for the design. So, all components like charging blocks, cables, humans involved there , cars , the canopies, transaction modes all are under the  design domain. So to go for the card, we need to  figure out the all  stakeholders . So if we need to find out the design place  we need look at

What are the features and where they are placed?

Like in danger- (like a chess piece attacked)

Attacking piece- ( actively creating a threat or solving problem)

Not developed Piece- ( doing the function but the feature can be improved)

The same way you can find out the opponents attacking piece or threat.  your targets and also the emotion center of your coustomer. When you place all of them its your design place.

In this particular example – oil or gas supply, payment or transaction, electic lines, cars ,human interactions, mobiles  roads all are the pieces of your oppo- nent.....

Your pieces-All the things which can be changed by your design is your pieces

Like- the cables, carging station . Canopy, the process, transaction method or their interaction, display, visual and audio signififers all are your pieces.

Opponent pieces-The threats or issues are may be the time required in very station, the mess of cables , transaction prolems, improper  comunication between the customer and the opetator in gas station all are the opponent pieces. All oppponent pieces are not threat to your piece or action. Some are actively creating trouble to customer satisfaction or process is hampered. So this active threats may be treated with primarily with design.

The design or the move of the designer- modification of the components to solve the problems, issues or enhance the aesthetics.  may be here digitilaztion of payment, better display, design of thin cables all are move from designers side. Particularly Move from the designers side is the response to the demands of the situation .

The point system-  the valuation of the feature is based on the economic value, utility, time of use, duration and ease of  use. Designer can make an evaluation of the designed features and can look into the issues it is handling .

 Now  the most important part

The opponents king- the emotion of the coustomer is the prime importance... if your feature can coonnect the emtional cord of the people as a cdesigner you are approaching to then it is certainly a fruiful move. Your pieces-All the things which can be changed by your design is your pieces

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 Now  the most important part

## 6.2 The way I made cards from chess tactics

Basically I tried to use the same game tecnique with methaphors to make cards. There are logical explanations behind all the metaphors
I have used. There are also some amount of simplification so that the tools remains easy. here I am going to explain every component of chess is how linked
with the design world.

## 6.3 Metaphors-The Chessboard- the chess board is the design field, where all the features and the problems and issues are moving. So basically
the when one feature is designed the design place automatically changed. So the next design advancement is the response of the change in the board.
So design field for aparticular product is the domain where all the internal factors and External influencing factors can move.
The squares of the board are targeted qualities by the product. The square symbolizers some of the goals like-
1. ease of use 2. Ergonomics 3. Safety 4. Hygiene etc..
which are actually linked with lot of things,
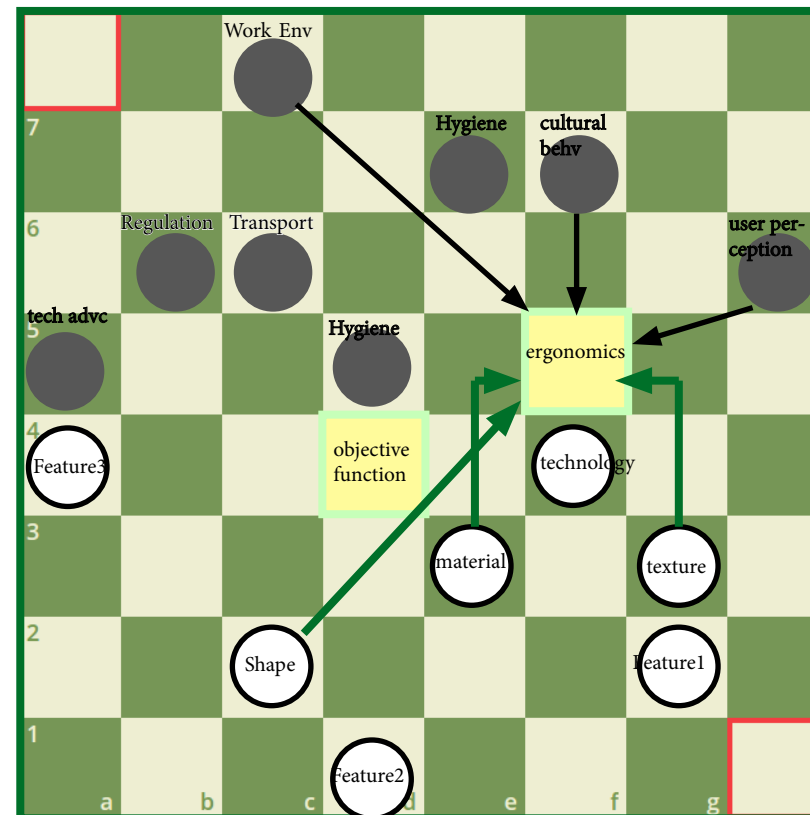
For Example of E-pit charging Station of Hyundai we can say there some factors mentioned below. And the domain of change of this factors are basically the design place for the Design of charging station,
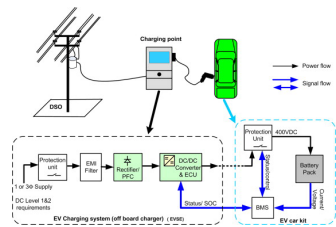


Design of nozzle or plug
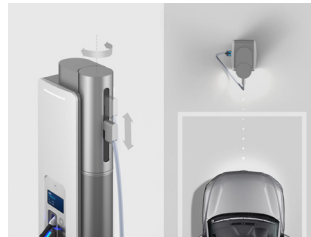


Design of charging Service & operational process



Transaction process and Technology
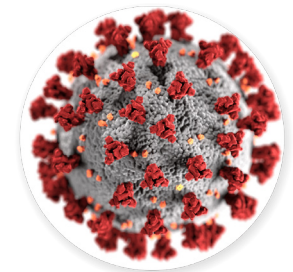


Cables and Battery



Power transmission system



Operators in charging station



Road side charging station



Corona virus and health



Design of the car



Human interaction in the charging station



Canopy and the structure



Layout of charging Station

## 6.3 Black pieces and what are the white pieces?

In my design space there are two types of movements, one is the movement of the outside, like the external factors, 1.raw material price, 2. govt regulation on the product 3. customer mentality 4. present trends and styles etc.
let's say they are the opponents' pieces, because we cannot control them

ATTACKING PIECE- there are some of the issues constantly challenges the design process, but with them there are some issues which are increasing concern for the matter of time. (Actively creating a threat or solving problem)
how a piece becomes an active concern for design, let's say for automobile design, pollution norms were something else in 2015, in 2021 if it changes rapidly then the design must cope up with the present law. so now the new regulation is the need of the hour. May be in 2020 or 2021 almost in all designs corona virus related hygiene issue was the most pressing factor.  If there is new technological development to incorporate that technology to the design is also an external factor. whatever is the component that attacks the features of the design or creates a threat to the objective the design wants achieve, is an active piece.

DEFENDING PIECE- Some issues directly doesn't bother the design, but they are the hidden reason behind the burning issue. For example, in this case corona is the burning issue. but in EV charging station how is corona propagating. it is because of the human interaction. then it follows the path given below.
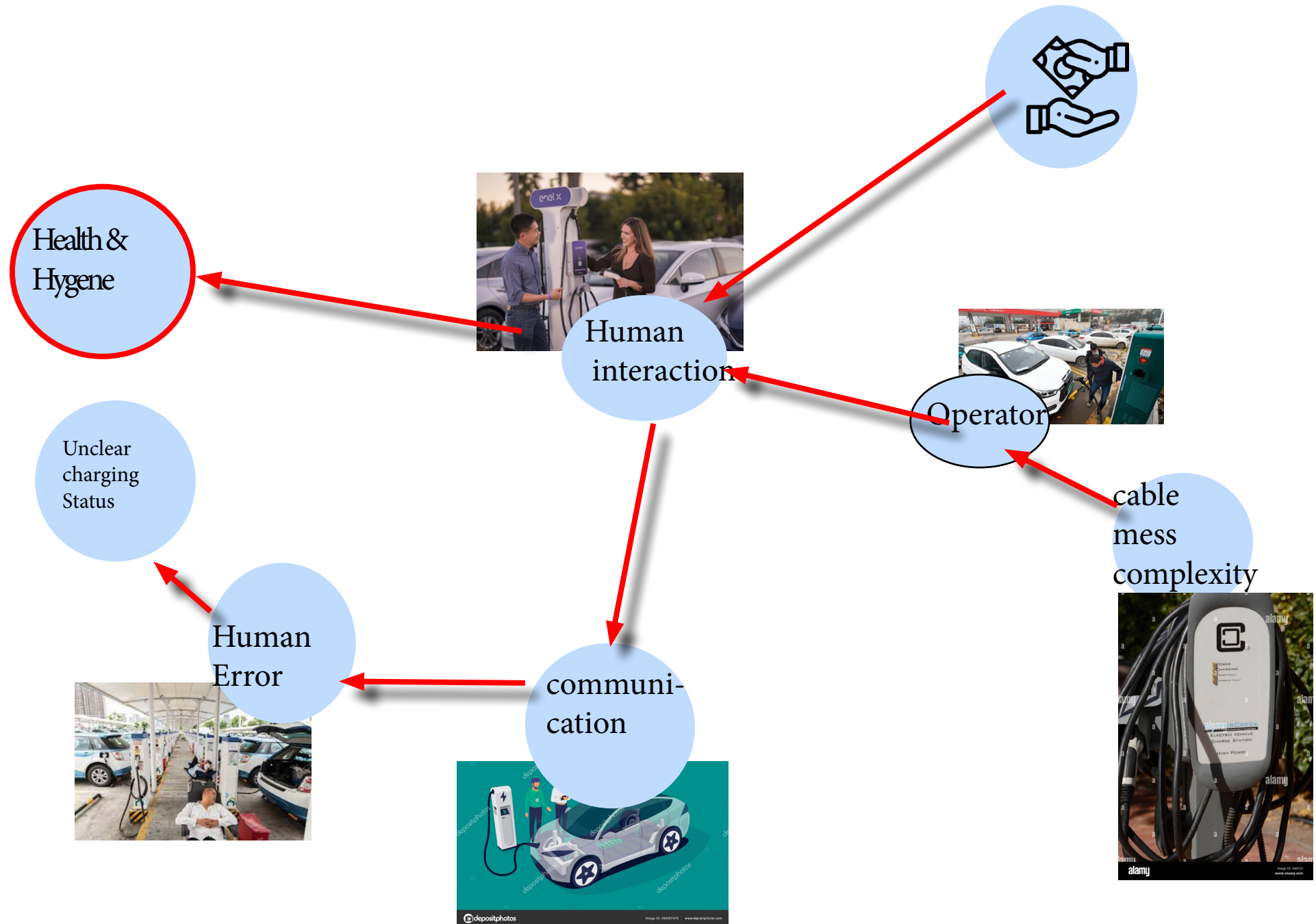
## 6.4 Example-
Now for the example of Epit Charging System of the Hyundai
Hyundai Motor Group is preparing for a new era of human-centered mobility. Hyundai Design Center has developed the E-PIT ultra-fast charger which greatly improves user experience, by solving six problems typically found in current EV chargers: 1) bulky cables; 2) complicated operation and service use; 3) unclear charging status; 5) hygiene (especially important in the context of a pandemic); and 6) production and maintenance.

IF AWARD GOLD STATEMENT-Taking cues from a traditional petrol station, this charging station puts the needs of the user first with easy operation and personalized interaction. Beneath the striking silhouette, all details are addressed from maintenance to hygiene. The designers have considered the entire experience and developed a solution that is simple, strong and approachable.

Jury Statement-Taking cues from a traditional petrol station, this charging station puts the needs of the user first with easy operation and personalized interaction. Beneath the striking silhouette, all details are addressed from maintenance to hygiene. The designers have considered the entire experience and developed a solution that is simple, strong and approachable

Health & Hygene

Unclear charging Status

Human interaction

Human Error

communi-cation

Operator

cable mess complexity

Your pieces-All the things which can be changed by your design is your pieces

Like- the cables, carging station . Canopy, the process, transaction method or their interaction, display, visual and audio signififers all are your pieces.



The design or the move of the designer- modification of the components to solve the problems, issues or enhance the aesthetics.  may be here digitilaztion of payment, better display, design of thin cables all are move from designers side. Particularly Move from the designers side is the response to the demands of the situation .

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 Now  the most important part

The opponents king- the emotion of the coustomer is the prime importance... if your feature can coonnect the emtional cord of the people as a cdesigner you are approaching to then it is certainly a fruiful move.
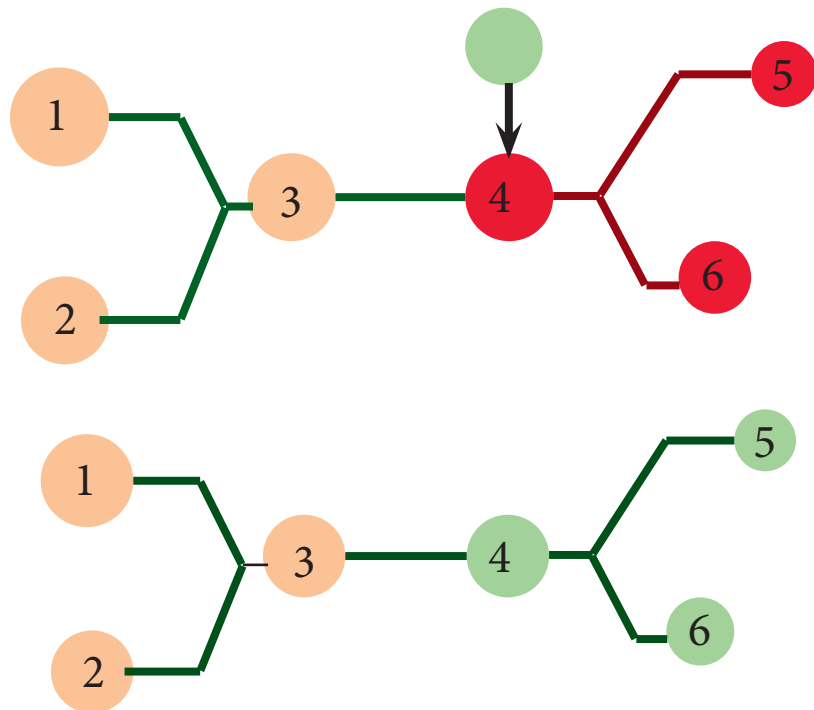
easy Service

Single cable

Digital Payment

Self explainatory mode of use
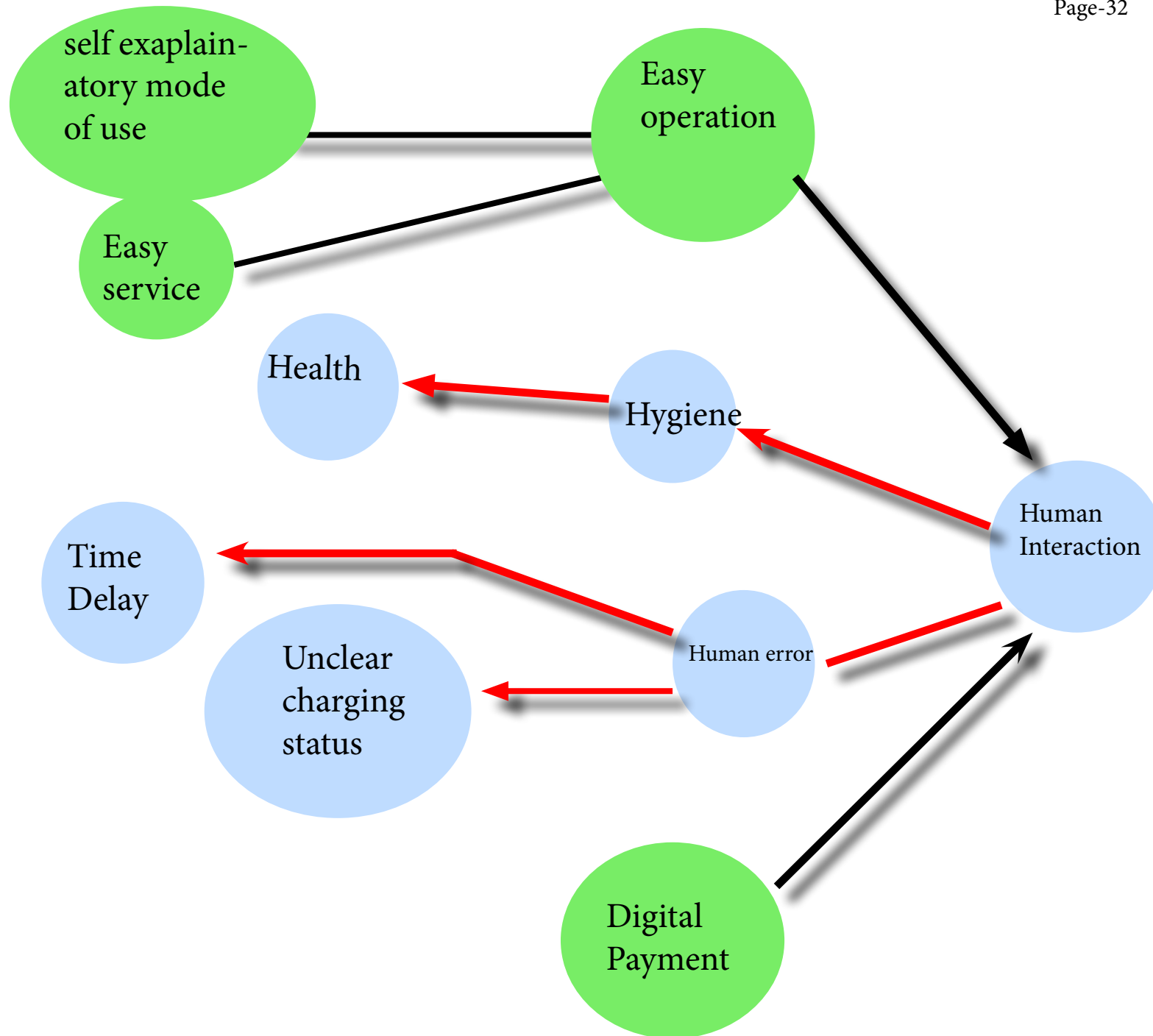
## ELEMINATION OF THE DEFENDER



HOW TO USE THIS CARD:
1. try to find out the main issue to be eleminated.
2. how it is connected to the product, it uses or its manufacturing.
3. check all the connection behind the trouble,
4. deep dive in to it asking for reason(5y method)
5. Hit the original source of the problem by your design

Hyundai Motor Group is preparing for a new era of human-centered mobility. Hyundai Design Center has developed the E-PIT ultra-fast charger which greatly improves user experience, by solving six problems typically found in current EV chargers: 1) bulky cables; 2) complicated operation and service use; 3) unclear charging status; 5) hygiene (especially important in the context of a pandemic); and 6) production and maintenance.

Taking cues from a traditional petrol station, this charging station puts the needs of the user first with easy operation and personalized interaction. Beneath the striking silhouette, all details are addressed from maintenance to hygiene. The designers have considered the entire experience and developed a solution that is simple, strong and approachable.

## 6.5  Simplification of chess and design correlation

In Design who is the player, who is playing against? what are the pieces signify? What does the chess board mean? All these things need to be clarified before going to discuss chess tactics cards. So here it is a simplification of the chess metaphors.



- •        The chessboard: The Design place for the product feature and the    influcing factor.
- •        The moving piece:  The designed features of the product, may be a part of the product. the Shape, Material, Color, Texture and weight etc, all of the factor which are going to be changed.
- •        The opponent piece- the influencing factor that the designer cannot control directly.
- •        The attacked piece:  The objective problem which going to solve.
- •        King of opposition:  The emotion center of the customer.
- •        Point of the piece:   The economic cost of the feature.
- •        Positional Advantage + point :  The value of the product or feature.
- •        Move of the Piece:  The design of the product or the change of the design of the product.
- •        Desired response:   Finally capture or eliminate or create compulsion
- •        The Active path of the piece:  The functionality of the product.

# 7. What are some popular Chess Tactics?

## 1. Attraction-

Attraction tactics occur when you lure (or force) an enemy piece onto a square where it will become vulnerable to another tactical ideas:

Diagram below: 1.Rxf6 attracts the black king to the f6-square.
The point is that after 1… Kxf6, white will play 2.Bc3+, a
skewer that wins the black rook on h8.
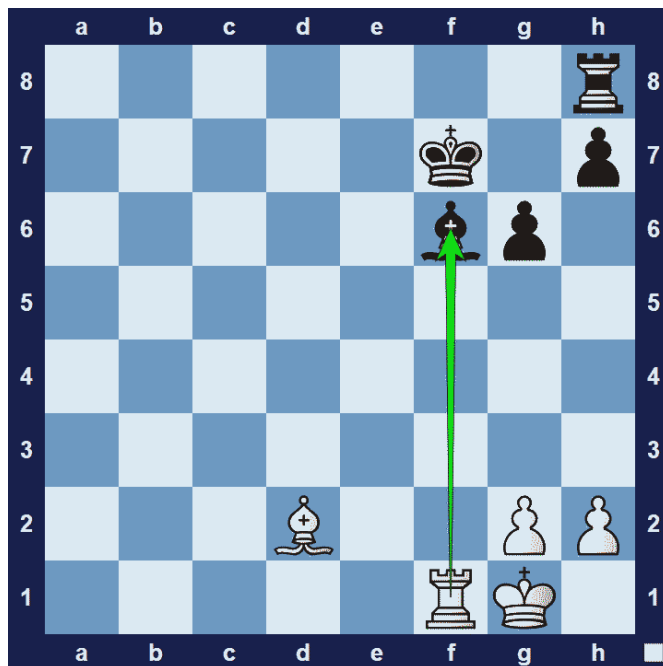


In design also this type of trick can be very useful for product design. For example- when the product is trying to attract the customer mind it can offer something new of small value. These small values are something that actually creates a huge attractive force to the product. Then, if the customer mind or specially if we say the users mind is attracted to the small offering by the product lot of times, then the product can create an habit for the human mind.

In chess if there is a free piece easily offered to opponent. People often looks at it with suspicion and does not take that piece, but if the piece has to be earned, they go for it. Actually, there joy the human mind gets from the acceptance of the challenge becomes an habit. There are two three chess tricks combined ly makes such type of trap.

Attraction, then a trap and kill makes a perfect trap.

## 2.Pin(absolute pin, cross pin and situational pin)-

Pin tactics occur when an attacked piece cannot move without exposing an even more valuable piece (or target)
behind it. Pins can take on various forms:

Diagram below: Black plays 1… Bf6 and pins the white
knight on c3. It is a relative pin because moving the
knight would expose the higher-valued rook on a1.



 In chess Pin is a very lethal tactics to hit the opponents one piece behind another.
Mostly when King is just behid another piece.And you attack the forward piece .
The forward piece cannot move because if it moves away the King will directly get a
check. Which is legally impossible. For that reason the forward piece cannot move.
And it mostly get killed by the attacker.

In product design we can use this Tricks analogy to attack the coustomer mind. In this
case the Feature soling the problem and the customer mind should be co linear- what
does it mean. It means that when a feature directly connected to the opperation the
mind cannot avoid to think about the same thing. So basically the piece is actually
attacking the function, in absence of which the mind is get affected.And no ther thing
is therre to stop that.

For exaple we can take about Xerox or google, the fotocopy is synonnymous to the
xerox . Internet searching is synonymous to the word the word google. The experi-
ence of this products make the direct relation with the product, lets take an example
of a motorbike called royal enfield, the sliencer of the motorbike is actually an expe-
rience that attaches the user mind with that product. You remove this sliencers sound
the customer satisfaction can be destroyed. So this pin is needed.

This can be multplied by from different perspective. From example one can be the
user experience. Another can be an legal Safety. If you make products feature iconic
, you can patent it which will be obstructing the opponent to copy that, Mostly this is
used to create a brand identity. When one of this users experience created by a prod-
uct, it becomes a signature or a trademark for that product.

**3Advanced Pawn**-If a pawn paases through a clear file where the oopponent does not have anything to stop the piece, then this piece is called a advanced pawn.

An advanceed pawn is a very powerful piece as the game forwards. In a product small innovation goes inruptedly in a direction for several times, it makes the product unique and it can be really pwerful innovation.

Diagram below: 1… Rd1! 2.Kxd1 h2! is a interference tactic that prevents the white rook from stopping black's advanced pawn on the h-file.



For example- The revolutionary design of Kimera's ventilation system guarantees excellent adjustable airflow, together with a separate port for goggle anti-fog and a separate port for hot air outflow. The combination of a ventilation system and quick-dry fabric liner allows for greater comfort even in the most demanding conditions. The liner can be easily removed and washed thanks to the proprietary click-in system. It also features the patented Fit-System, a self-adjusting element that ensures maximum stability.

So basically all are going in the same direction of innovation and that is comfort of the user. the difference from the FORK or Double attack is it is not solving multiple problems.It is bettering the existing components-
1) anti fog googles
2) air passage
3) better Fitment
4) self adjustment etc.

**4. Alkhines gun or battery**-In chess, a battery refers to lining up two or more pieces on the same diagonal, rank or file. Only queens, rooks and bishops can form a battery. The rooks can form a battery on a rank or file whilst the bishops can be part of a battery on a diagonal. The queen, of course, can be part of a battery on a rank, file or diagonal.

Diagram below: 1.Rd8+ Rxd8 2.Rxd8# The back-up provided by the second rook delivers the checkmate.
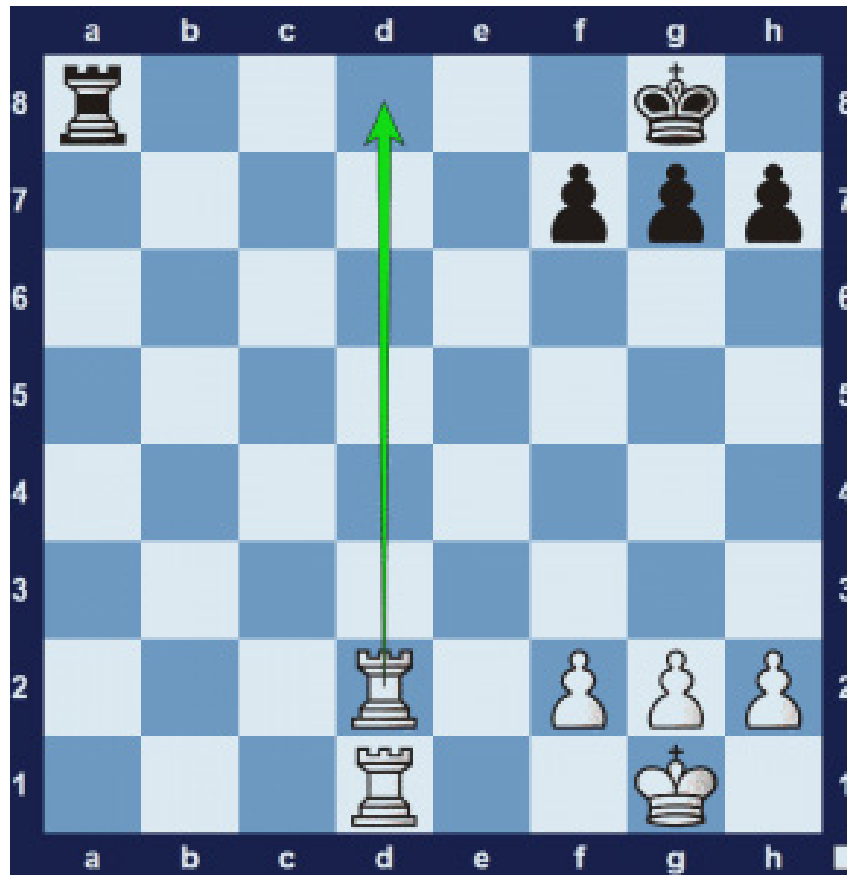


When the rooks and aqueen pilled up for a single piece or a single coloumn , the attack becomes letheal and the technique is known as alkhines gun. For this kind of strategy can be used in product design where in multiple layers , multiple feature are used to solve one problem. For example if there are multiple options of making a payment- like digital medium, cash and coin or qr code scannning. So if one machine can can take care of all the ways possible to transfer of the money it can be a great option to install.

Designa's automatic pay stations are designed to handle all kinds of payment processes with the highest requirement for reliable outdoor electronic equipment. The client can choose a pay station that best matches their parking management system. This includes which payment options to offer the end customers (cashless, coinless or accepting all forms are possible). The terminal ensures smooth payment and information processes combined with modern design. Highlights include the intuitive user interface, barrier-free layout of the operating elements, software-based solutions, and integrated TFT color display.

**5. Remove the Defender-** In  this process  if a piece is supported by another piece,  the defending piece needs to be killed first to make the  piece which was previous a protected piece to  make a free piece or unguarded piece .

In product design, if we find a problem in the network of the operation and its eco system. We need to find out, what can be the main issue from wjere the problem has arised, And try to eliminate the most original  or the primitive stage of the problem so that the root of the problem should go away.

When a chess piece performs an important defensive task we refer to that piece as a defender. Since that piece serves important an important role, the piece itself becomes vulnerable to tactical ideas.

There are 2 logical ways to exploit an important defender:

Capture or
Overload
Capture the Defender



Diagram above: 1.Bxc6+ removes the defender of black's queen by capturing it. Since black must deal with the check first, white will

Overload the Defender
The other logical way to remove a defender is to overload it (sometimes referred to as a deflection tactic).

In the diagram below, black's rook defends the bishop on b4. However, this rook also defends against a Back Rank Mate, else white could play Re8#. This gives white an opportunity to overload the defender:
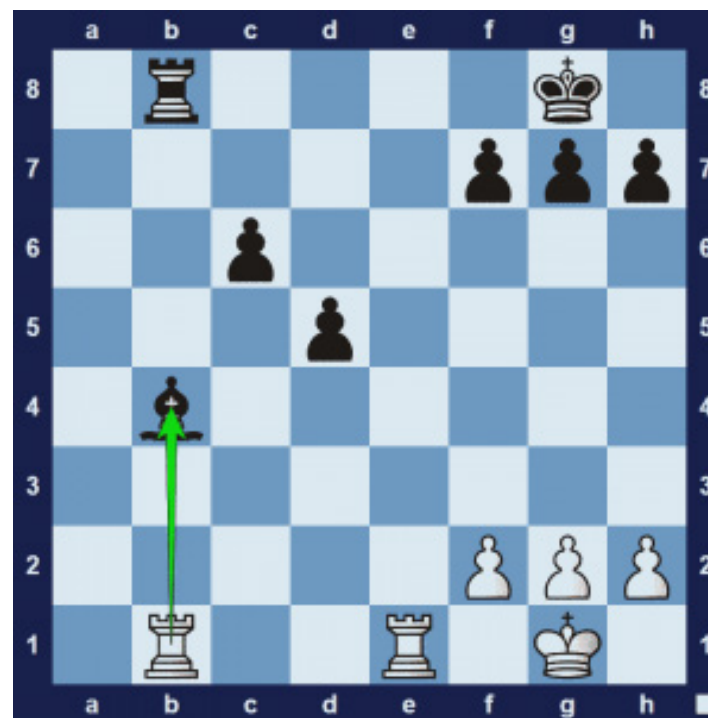


Diagram above: 1.Rxb4 wins the bishop because black's rook on b8 is overloaded.

**6.Clearance-** Clearance is very simple thing, its a tactice to capture a total file unobstracted by the opponent.

In a field completely unexplored the first product goes to market can get an huge advantage. The stategy is very simple and it can be mostly used in new domains.

Diagram below: 1… Rh1+ clears the h8-square for the queen.　　　Example NOT FOUND.
The point is 2.Kxh1 Qh8+ 3.Kg1 Qh2#
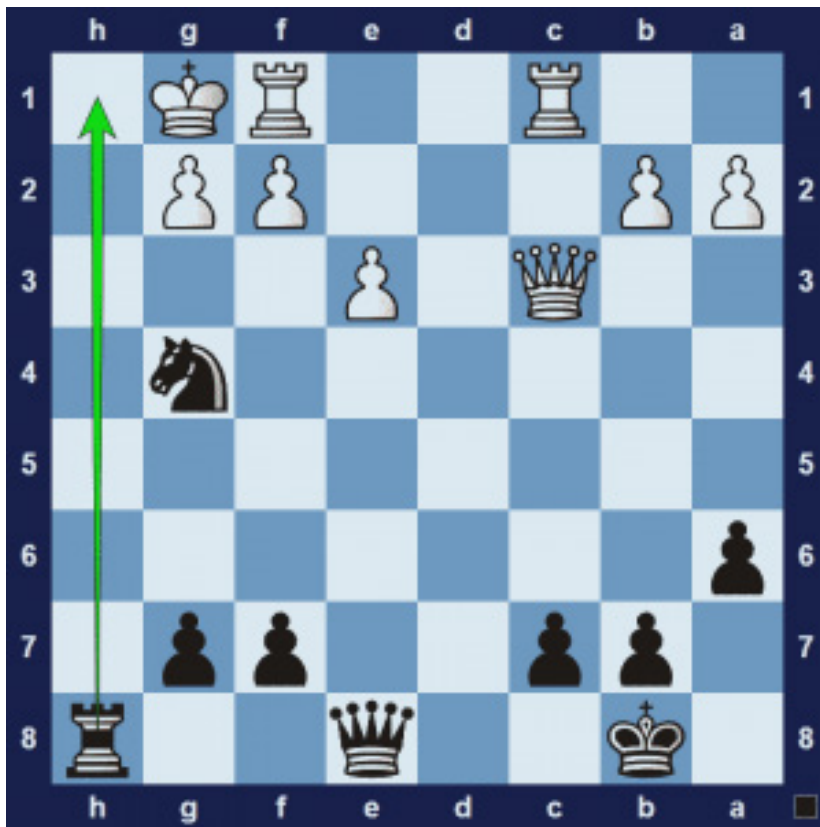
# 7.Counter threat/zwisangsug -

A zwichenzug or "in-between-move" tactic, refers to the effective use of an intermediate move (usually a check, threat or capture) to gain a tempo. The idea is best explained by means of an example:

In counter threat player does not response to the threat with a defensive approach,actually the player creats a new attack which can solve this problem as well as keep busy the opponent to move other product. Its a kind of double attack where as the one the attack is launched on the active threat. And another is a check or a threat to queen .

In product design, if there is an active threat in the product ecosystem so that it requires a chance to counter that. But the designer did not go in the orthodox method. He created something that attacks another magor problem and also solve the threat, then this tecnique is called as counter threat.

Diagram above: White just played 1.Bb4, threatening to capture the rook on f1. Instead of moving the rook, black finds a counter-threat, 1… Qd4+, followed by Qxb4.

**For example-**
**Urban Smart Fiber Soil-**

Fiber Soil is a planting base made from the inseparable materials in recycling clothing, a mixture of cotton and polyester. Thanks to its soft texture and modular skeleton, it can be easily assembled to create large-scale green walls and floors, whether flat or curved. It also incorporates technology for automatically regulating water retention. This is a brilliant green solution that combines the ecological precepts of recycling and reuse to create something new and truly beautiful.
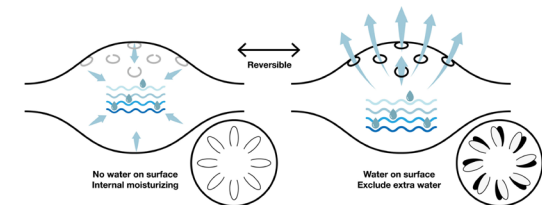
## 8. **Hit and Run-**

It is a process where one piece which is under threat directly goes to attack another thing. One side it defends and in another place it attacks.

In design if a products output or by product which creats a problem for the product can be used to develop a new feature coherent to the product , it can considered as a hit and run.
Basically this is also the same type of operation as the previous and the privios example for works for it.

## 9.Interference-

Interference is when you obstruct the connection between two enemy piece and in effect cut of a defender.
Diagram below: 1.b4 cxb5 2.Qxd3 illustrates how black pawn on b5 now interferes with the black rook's support from the bishop on a5.



The AX System is an innovative AI-based, preventive traffic-light style system that monitors dangerous crossroads and sections in warehouses and industrial facilities. With the power of artificial intelligence, the AX System predicts dangerous situations or potential accidents and emits a distinct warning. The signaling system enables a more seamless operation of forklifts, speeding up workflow while reducing risk to human life.
 Here the two vehicles coming in perpendicular direction can create an accident . in between these two putting this AX system creates a interference to avoid the accident.
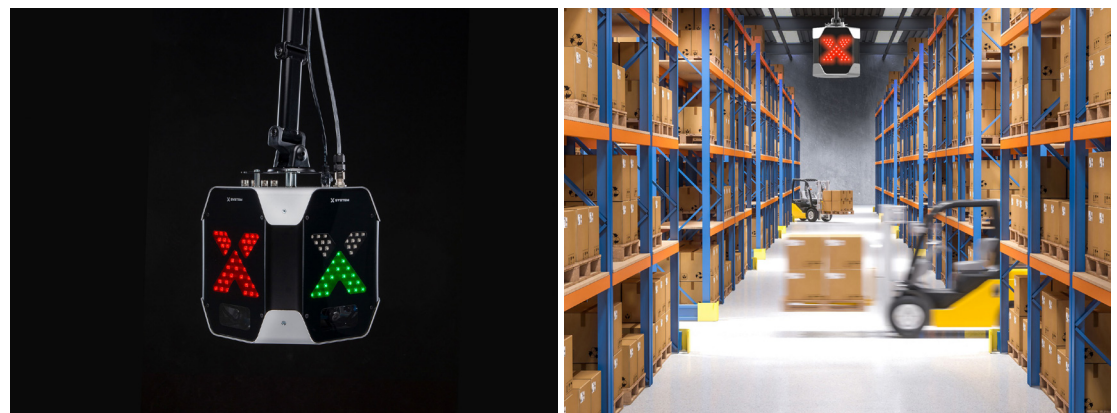
# 10.Demolition of Pawn structure-

Demolition of Pawn Structure refers to removing the defenders (pawns) in front of castled king, usually at the cost of a sacrifice. The Greek Gift Sacrifice is an example of this tactical idea. (The attacking player will sacrifice a bishop to demolish the pawn-barrier in front of the enemy king).

If there are lot of clustered problem, just break the link in betwween them to make the other problems much easy to solve.

Diagram Below: Black played 13… Bxa3, demolishing the pawn structure that defend the white king. If white accepts the sacrifice then 14.bxa3 Qxa3+ 15.Kb1 Nb4 and there is not much white can do about the threat of 16… Ba2+ 17.Nxa2 Qxa2+ 18.Kc1 Qxc2#

Ity is almost like a elemination of a defender but with a major sacrifice with a big piece.

https://www.lightshopping.com/en/linea-light

To solve a cluster of problems linea light system actually sacrificed the cost factor for the upliftment of technology.

INK is the solution to overcome the problems caused by pre-existing incomplete electrical systems or environmental limitations: a patented LED lighting system that includes multiple items working from the same concept. The flexible cable can be mounted as stretched system to enlight arches, beamed and ceilings of value, or can be inserted inside ceiling/wall modular extrudes to create a branched path on the surface. The cable acts as a conductor on which it is possible to hook the various compatible devices, allowing the adoption of various lighting solutions, even in places where it is not possible to install light sources on the ceiling.

**11.Desparado** - Desparado is a combination of sacrifice and zwischenzug. Here it is gaining tempo and a sacrifice in chess. In design field, it is same with Zwischenzug . No major difference found.

**12.Sacrifice-** almost like lure or attraction, but here the player offer a bigger thing. This is done to make a statement. It design , this is a huge bold move from the designer side , for example if the designer is taken the challenge to make his products completely ecofriendly, he some times throws away the obivious choices of the materials like plastics and goes for a costly ecofriendly product, which is sacrifice of the pov of cost.

Diagram above: White wants to play Rxb7 but black will then play Rxe7, resulting in an equal exchange of the queens. Instead, white uses a despera- do to "get something for his queen" before playing Rxb7.

1.Rxc6+ Kxf6 2.Bc3+ Kf7 3.Bxh8. White temporarily sacrifices material but wins it back, with interest, on the following moves
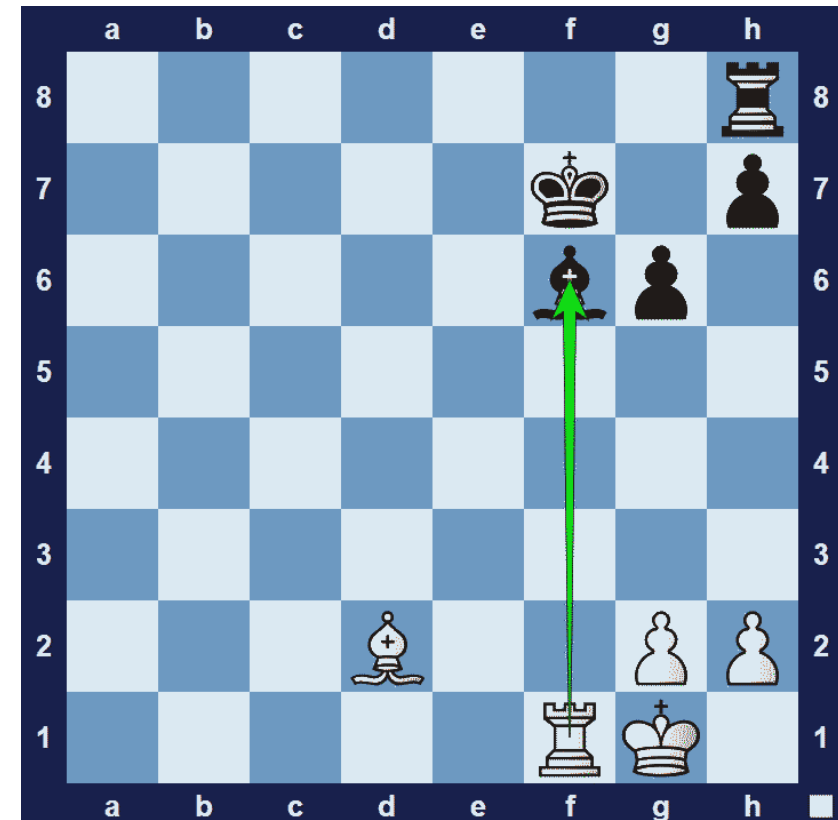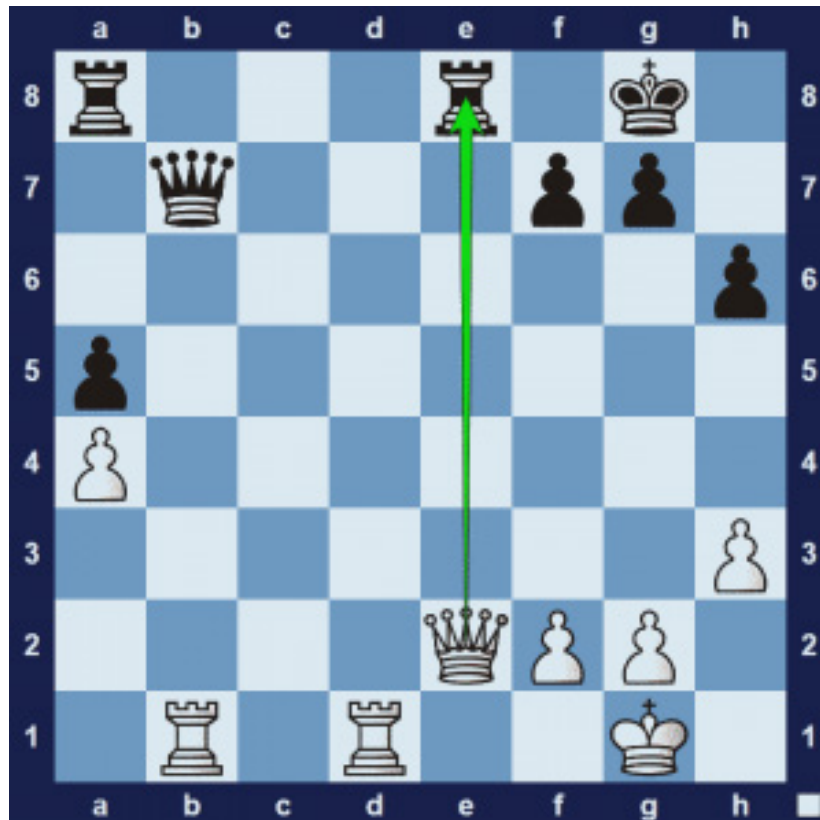
## 13.Simplification-

Simplification actually refers to a strategic idea where the player with a material advantage wants to simplify the situation by exchanging as many pieces as possible. The goal is to achieve a relatively risk-free endgame situation.

In the example below white has a clear advantage, thanks to the extra unopposed pawn on the a-file. But things aren't over yet–one mistake can still ruin the game for white! White finds a way to simplify the situation by exchanging all the remaining pieces and achieves a risk-free winning position.

Diagram above: White plays 1.Rxe7 Qxe7 2.Qc8+ Qf8 3.Qxf8+ Kxf8
4.Nxd4 cxd4 5.a5 1-0

14. **Discovered attack**-Discovered attack is one of the finest strategies that is used in chess. Here on piece is moved from the front and another pieces file goes open by the movement of the first piece. Precisely if we consider there are two pieces , one is the active piece and the second one is the passive or hidden piece. Hidden piece (Bishop) active path is getting obstructed by another piece (Knight). Now if the knight moves to attack or kill a piece of the opponent , The file for Bishop will be open. If there is a piece like king or queen present in the file, it is actually in the range of the bishop. The piece moved, knight is attacking another piece. So the opponent who is going to play the next move, cannot protect both of the pieces, most likely he is going to lose one.

The same thing can be imitated in design. Like one product is going to be designed have a purpose to solve. But the product can be perceived in a different way  to the customer. For example the products which comes under consumer electronics can have complete different look by having a ceramic or stone finished door and body. The design language of the product, is actually going to tell the coustomer that, it is not  a consumer electronic, mostl;y it is a furniture for the kitchen or for the drawing room . Thus  the effect  of disguised  products attracts the coustomer.

It may not be always the look , it can be another function also. For example we can take example of yankee candle. The yankee candle is not bought for the light it gives to the room . The fragrance of the candles are the highest attracting point for the customer.
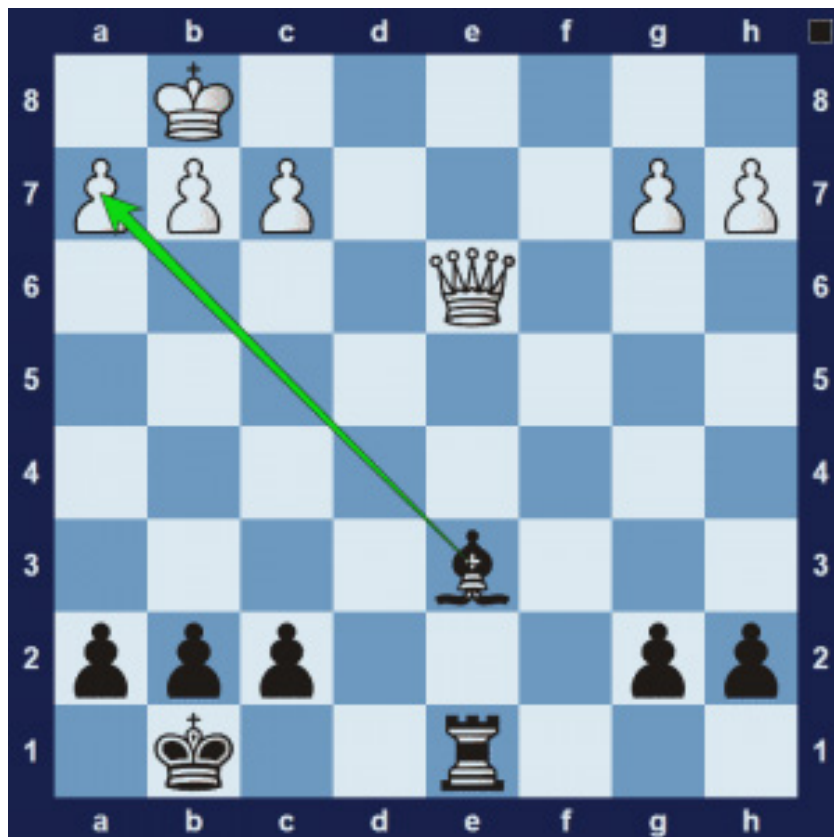


Diagram above: 1.Bf6! Qxh5 2.Rxg7+ Kh8 3.Rxf7+ Kg8. White repeats the pattern−4.Rg7+ Kh8 5. Rxb7+ Kg8 6.Rg7+ Kh8 7.Rg5+ Kh7 8.Rxh5.

Ceramic fridge
BSH Hausgeräte GmbH
This refrigerator has a monolithic appearance, interrupted only by a narrow stainless steel strip. Inspired by modern architecture, its most characteristic feature is its true-to-nature ceramic applications. The slender shape blends perfectly into contemporary kitchens. Thanks to the use of hygienic materials, the vibrantly textured, silky-matt surface is very easy to clean. Combined with the trendsetting hyperFresh Plus freshness technology for prolonged shelf life, the appliance offers an excellent user experience. Also optionally available in a white marble look.

**15.Domination-** Domination in chess is used to block a piece from all the effective squares it can go, actually it is trapped  it is safe its own position.Don but can not be active. In certain scenarios at end game a bishop can block the advance ment of  a knight or vice versa.

 In design also the this can be used to stop a  problem to propagate further. It is mostly a preventive measure to stop an problematic cause.  For design it is very similar to trap. Here the issue is not  totally resolved mostly prevented from failures. It creates a zugswang for problem. If the same condition happens for the product feature, the further design  improvements becomes very difficult. Mostly for techinical advancement for the products stops somewhere in the timeline.

 Diagram below: Black played 38… Qd3. Despite
 having 6 squares to choose from, the knight on c4
 can't escape.
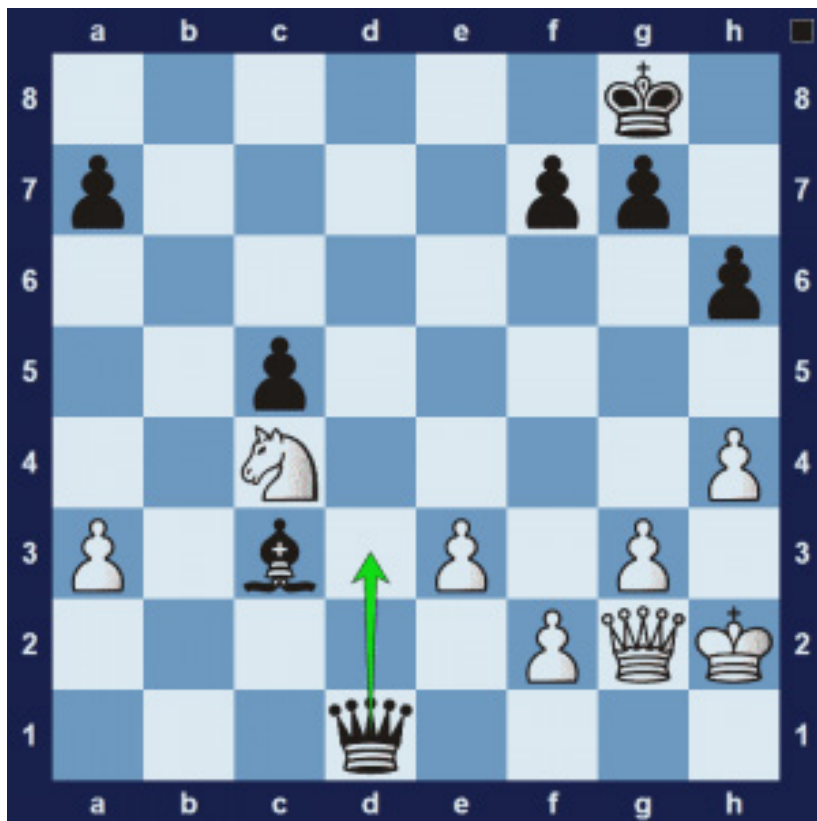
**16.Double attack/ Fork**- Double attack or Fork is a very popular chess tactics to attack multiple pieces at the same time. So it actually causes a material gain. It is much power full weapon when it is done by a knight because its path can not be obstructed and if the fork is done by a pawn then it is very useful as its point is small in comparison with other pieces.

There are multiple examples where one product is upgraded or advanced to be used as a more verstile tool or object. here the airluna is used as a air purifier and also a air purifier.

Diagram above: 1.Nf5! creates two threats at the same time. White is threatening 2.Qxg7# or 2.Ne7+, forking the black king and queen. Note that white's threats involve 2 attacking pieces, 1) the queen and 2) the knight. Therefore its a double attack rather than a fork.
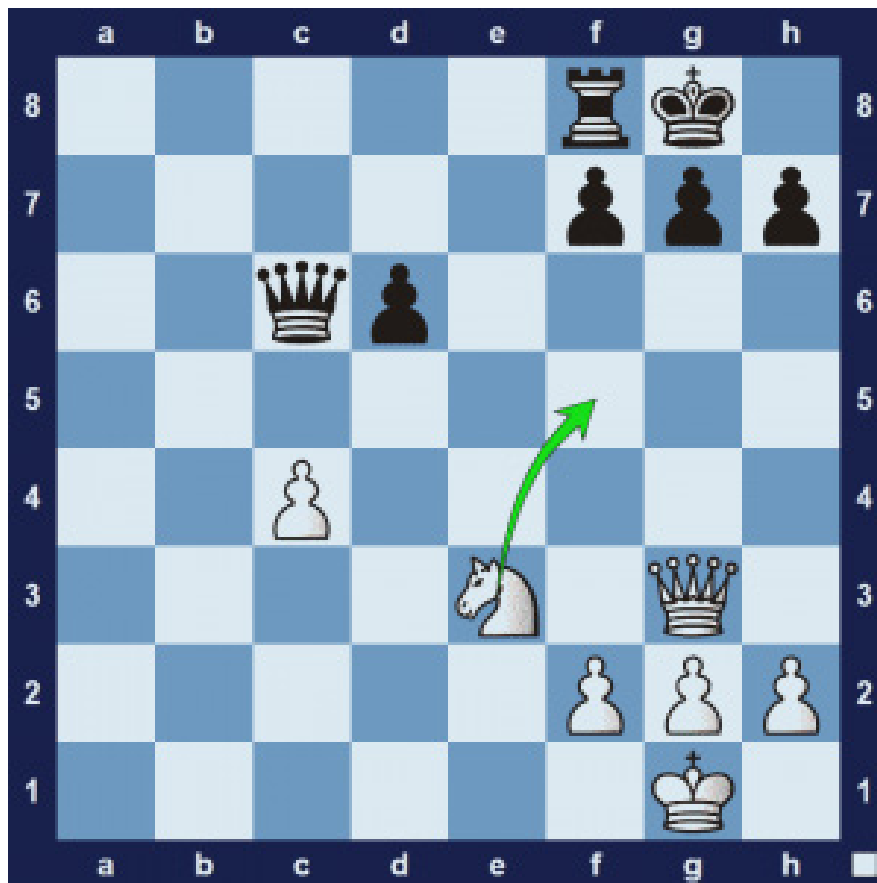
there are lot of Examples where one product got somew additional feature to solve some more problems. So this is one of the most used Airluna is the world's first air purifying lamp. Equipped with patented PACO nanotechnology, Airluna can destroy 99.9% of viruses, including microbes even tinier than COVID-19. The device also breaks down the molecules of harmful chemicals and odors into harmless elements. PACO technology can last up to 10 years, greatly reducing replacement filter costs and the device's environmental footprint. The Airluna app lets users can remotely control and monitor indoor air quality. Other benefits include Airluna's space-saving design and contemporary form factor, plus its ingenious use of airflow to lower the heat of the LED, effectively prolonging its lifespan.

## 17-Triangulation

If a king does not have more places to go, and to protect a pawn or a piece, mostly it switches between two squares and there it creates a problem if the moves are repeatative from the opponents side also it will be a draw match by repeatation. To make the game alive and avoid to draw scenarios.

In Design, to remove boredom, designer can introduce some variation in the Experience of the product to make it unorthodox in from the point of view of user.In some special cigrattes comes with switch option.
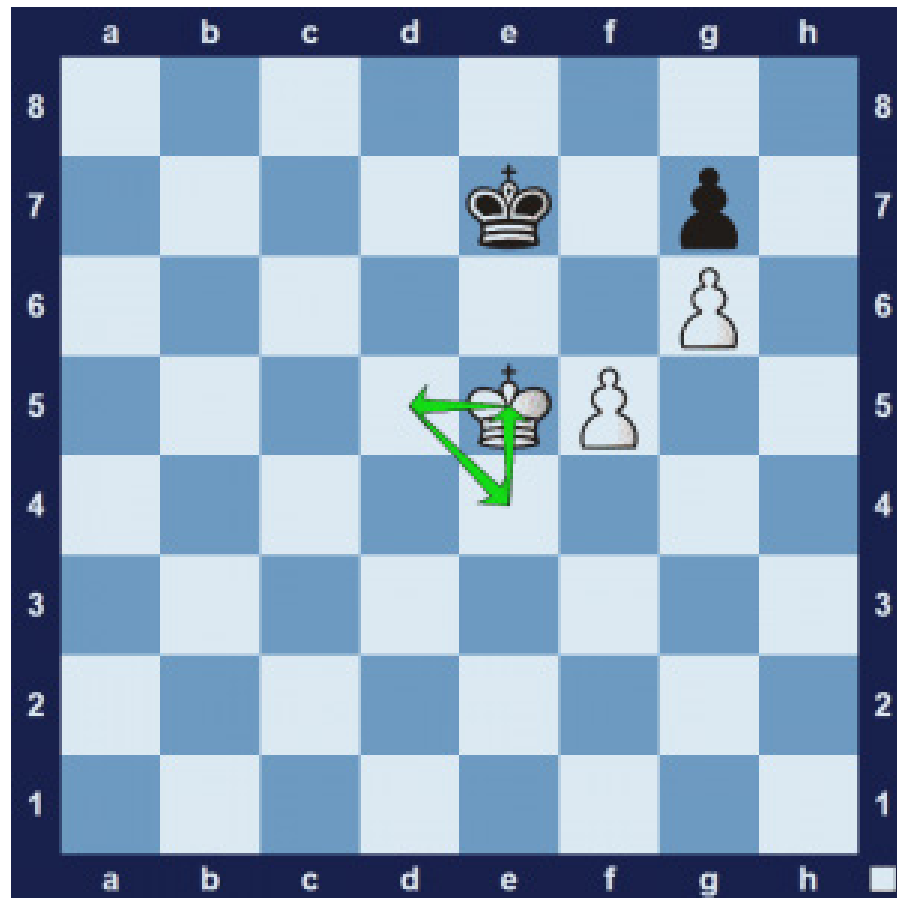
**18. Weak back rank-** Back rank mate is one of the simplest methods to mate. In this case the king's front row is completely blocked by his own pawns. So, the opponent rook comes to the same row of the king. The king does not have a place to go outside. So, it is a checkmate. Now weak back rank is when the king has a rook, or a bishop or any piece for which the back rack is not possible. That time a lure is offered to the piece, and if it goes away to kill that piece. Then rook comes into the row of the king. Now if the piece comes back. The rook will kill it in the next move, and it is a check mate.

Weak Back rank in design can be a useful trick. In some cases where a new product is launched. Sometimes their interface looks completely alien to the user. Now the user is afraid to use this new experience. But if the interface is introduced in such a way that after these two steps its same as your previous device. This is a fundamental principle to create a familiar user experience. Especially when a user actually self-mental block for technology, this is great solution to reach that person.

Diagram above: Black plays 1… Ne2+, forking white's king and queen. If white captures the knight, 2.Rxe2, then black can exploit the weak back-rank by playing 2… Qb1+ 3.Re1 Qxe1#
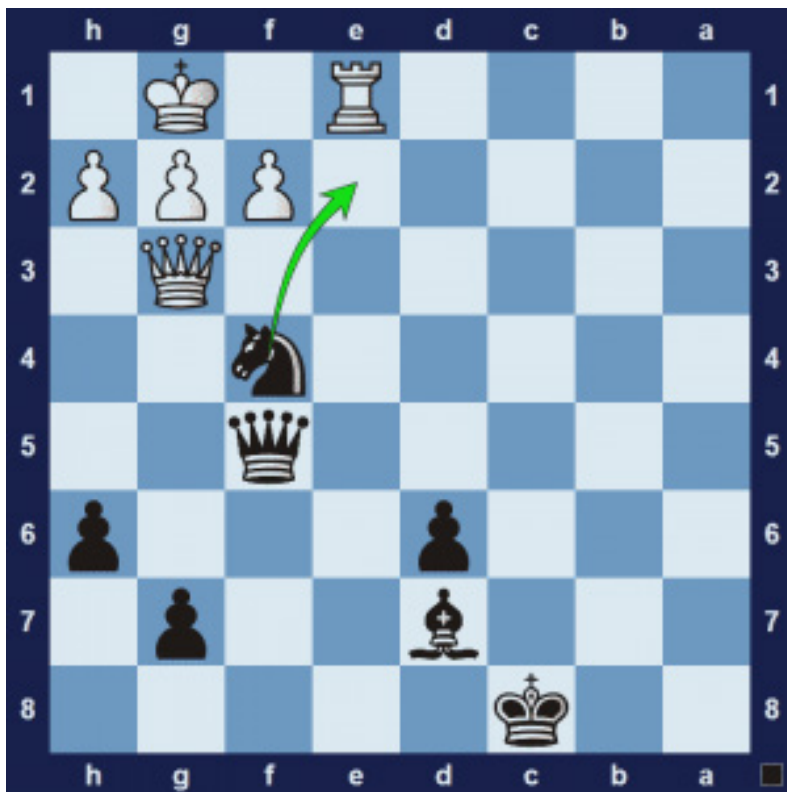
**19-Xray attack-** Xray attack is when one peice defends through a piece of opponent. For example  queen is in the line of a bishop and queen battery of the opponent. In that case the opponent queen can not kill the battery queen because the queen is actually under the indirect defense of the bishop.

Not any significant design example found.

In the diagram below black just played 1… Qd1+, hoping for 2.Rxd1
Rxd1+ 3.Qe1 Rxe1# However, white can defend with the help of an
X-Ray Defense.
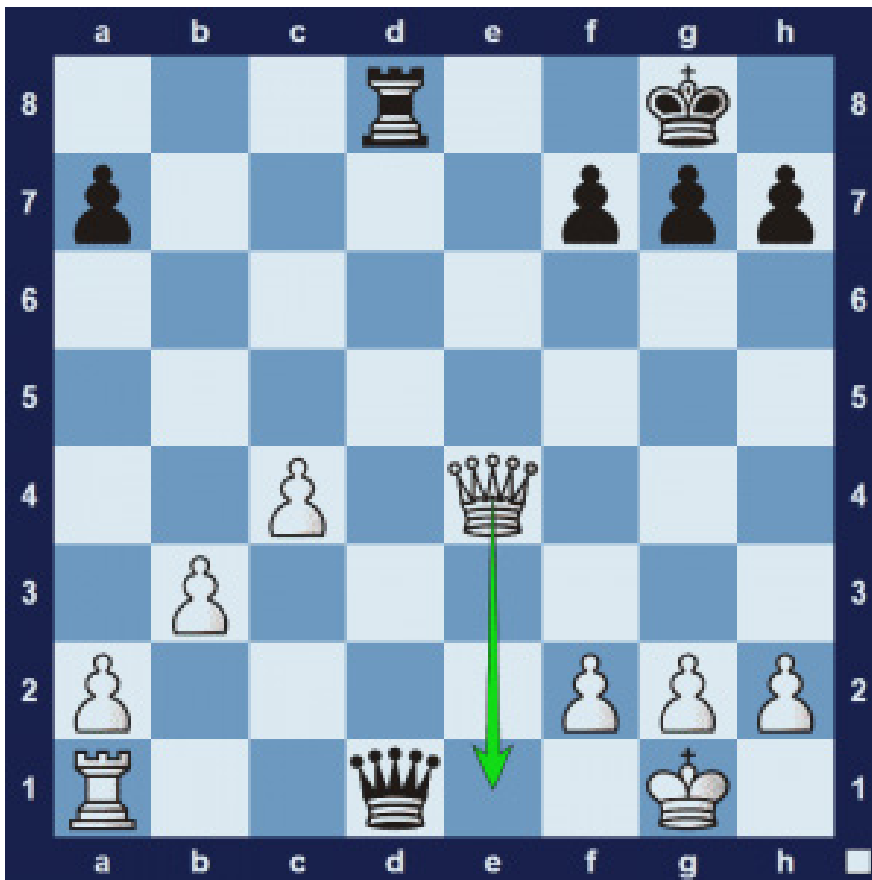
**20.Underpromotion.**- Under promotion is a very peculiar pawn tactics. pawns can advance one square in every move but if it reaches to the final square, it can be promotated to any other piece other than king, means queen, rook, bishop, or knight. but mostly people choose only Queen it has maximum power. But sometimes according to the need of the game, sometimes the pawn is underpromotaed to a knight or bishop or rook.

Diagram above: 1.g8(R) under-promoting to a rook is the only way to avoid a draw in this game. Even if white knew how to checkmate with a knight + bishop vs king, this would not be the time to try it because 1.g8(N)+ Kg7 2.Ne7 Kf8 forks the white knight and bishop. Draw.
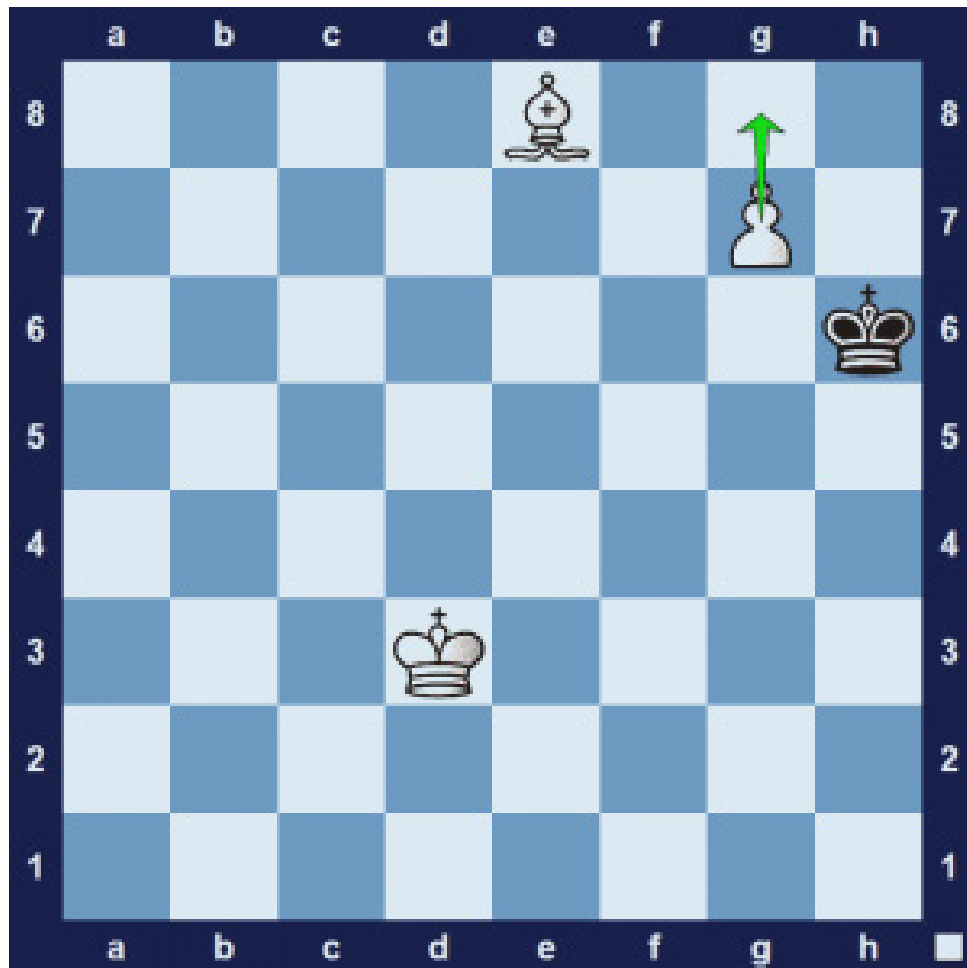


Plato, the new chair from designer Jasper Morrison is a rigorous, minimalist piece that is both versatile and sturdy, and well-suited for both indoor and outdoor settings. Understated and with a neoclassical inspiration, hence the name that references one of the fathers of classical philosophy, the Plato chair represents a harmonization of different spatial spheres.

# 8.How to validate The Idea?

Now It is the time to look at if this cards can demonstrate Some examples that is already got apprisiation from a reknowned patform. to find out this type of platfrom. i looked into the Design award winners and the entries. Because this actually makes the things more uniform and the examples will have some simililarities. There are lot of Design Award competyetions, As a designer I am fond of them. I choose IF DESIGN AWARD.
What is if Design?
Founded in 1953 as Die Gute Industrieform e.V., iF Design and the iF DESIGN AWARD have been a symbol of excellent design around the world ever since. Every year, an international jury panel of 100 independent experts honors achievements in product, packaging, communication and service design, architecture and interior architecture as well as professional concept, UX and UI.

iF Design also contributes to the international design community by organizing the iF DESIGN TALENT AWARD for young designers and the iF SOCIAL IMPACT PRIZE for social projects..
in the year 2021, the product design award winners i choose as my sample set

## 8.1Example 1.

Smart Steam
Cookware set
Controlled evaporation: New technologies require innovation. For state-of-the-art stoves with cooktop extractor fans, Smart Steam is the best match. Strategically placed lid openings and a clever indent in the rim of the pot ensure that the steam comes out on the side and goes directly into the extractor fan. Evaporation can be managed by slightly turning the lid. The grey silicone ring ensures a great fit so that unpleasant food odors are kept at bay.
here we can see there are two main things are done,
One is the energy consumption that has been minimalized by lot Different aspects. and the second most beautiful aspect is the bad odor. So the bad odor is not coming to the cook or the visitor to the kitchen. here the odor is not eleminated. they have just made a smart way to deflect the odor with the clever indent in the ream of the pot.


Mal odor during cooking


Smart Elo cooking with extractor fan

Controlled evaporation
New technologies require innovation. For state-of-the-art stoves with cooktop extractor fans, Smart Steam is the best match. Strategically placed lid openings and a clever indent in the rim of the pot ensure that the steam comes out on the side and goes directly into the extractor fan. Evaporation can be managed by slightly turning the lid. The grey silicone ring ensures a great fit so that unpleasant food odours are kept at bay.

Stainless-steel 18/10
Integrated oil dosing system (Oil Optimizer)
Energy-saving capsulated bottom
Measuring scale
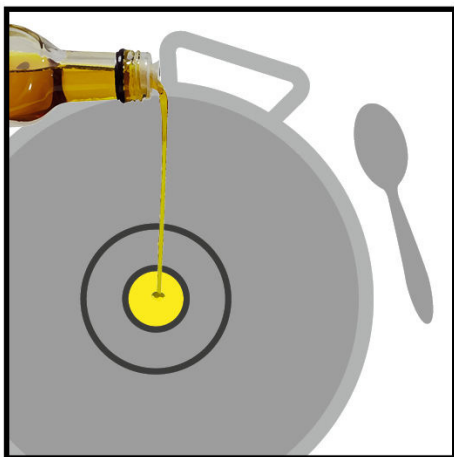Optimal for vitamin saving cooking with less water
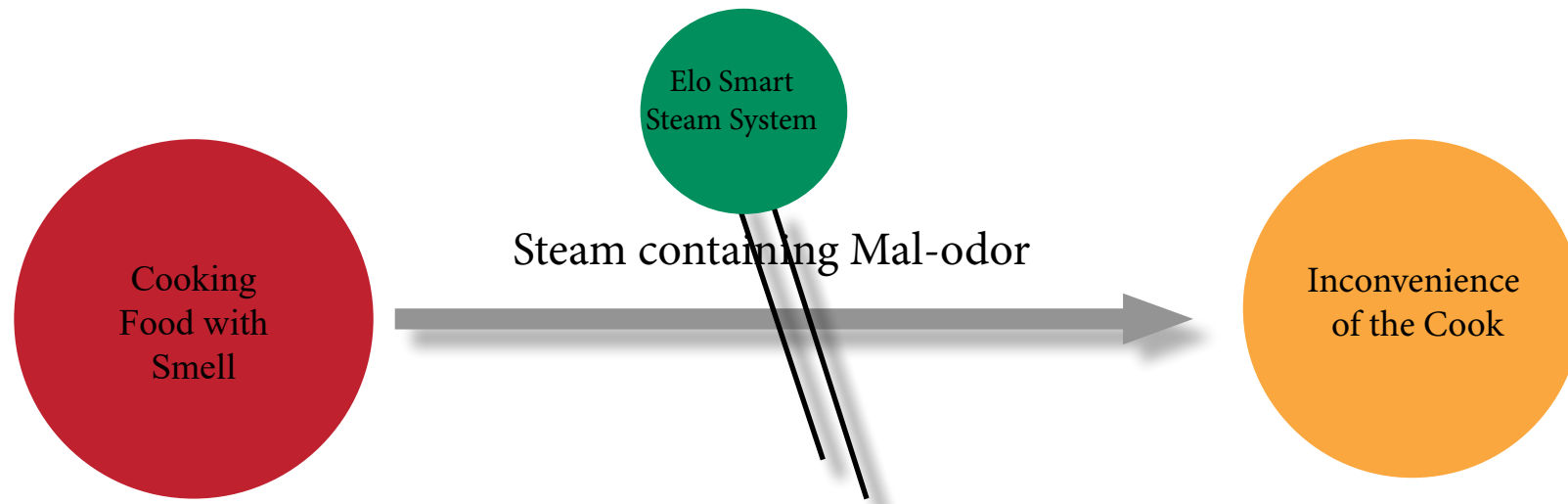Shock resistant glass lid
Dishwashersafe
Heat-resistant up to 240 °C
(with glass lid up to 180 °C)
Suitable for all types of hobs

# ◉IL OPTIMIZER

Elo Smart
Steam System

Cooking
Food with
Smell

Steam containing Mal-odor

Inconvenience
of the Cook

Basically in this part the intersect strategy is used to avoid the smeell. Cooking process is not same for all the foods, and its really difficult to nullify the smell of the food or to eleminate the agents which causes mal-odor, So basically here to avoid the smell a intersect or a deflecter came to stop the inconvenient smell.

OIL OPTIMIZER

Energy-saving capsulated
bottom
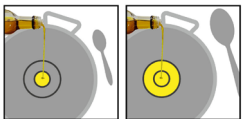
Controlled Evaporation
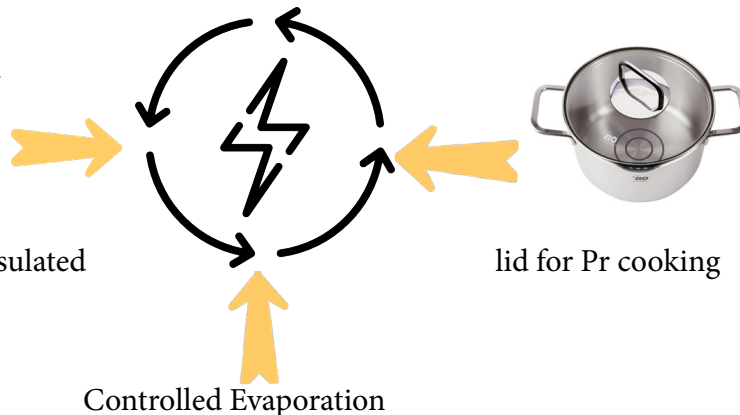
lid for Pr cooking

on the other hand to do energy conservation, energy saving capsulated bottom , lid for pressure cooking and controlled evaporation all are trying to contribute achieve one goal .
So basically this is more likely a synchorized attack technique of chess or can be particularlly said as battery.

## 8.2 Example-2

Horizon Sideboard

Sideboard

The Horizon sideboard was inspired by rectilinear motion, a rhythmic act. The piece portrays the strength gained from a set of repetitions transformed into a single homogenous block. The rectilinear motion, alongside the trianglular form, allows the drawers to be opened through subtle cuts in the wood, hidden from the eye, that call for intuitive human movement. To accommodate multiple settings, the sideboard was designed and is manufactured to be suspended from the wall or with legs for support.





the product have the  a simplicity in it. all the signifiers are into the hidden affordance. which actually a bold move by the designer. Here the product is actually not sold to the customer with a different communication where the furniture doesnot talk about an utility its more  likely painting on the wall or may be a showpiece in the room.

So I think the product uses a technique which has resemblence with discovered attack.

The details of the Products says how everything is hidden with a sense of beauty. the wooden joints Lapped machine cut Dovetail joint. which eleminates the purpose of of screws, or nails to join two parts. this actually helps the clean look.

Thus it enhances the rhythmic  Sense of the product.

The repetation of pattern is resonating the Meaning of the art.

Now just focus on the  external Form given to the wood,

1. This has nothing to increase  the volume of the available space.
2. The cost of the Machining is certainingly lot higher than normal shelf
3. The ease of use not enhanced.
4. Maintance during shipment and packaging  is higher.

So, it is an sacrifice and attraction techniques  to the audience.

**8.3Example3**- Blanco Evol Pro Soda & amp.

With the Blanco Evol-S Pro Soda &amp; Filter users can get chilled, filtered, and still or sparkling water directly from the tap. In fact, it's an all-embracing 5-in-1 drinking water system. This is because the Evol-S Soda &amp; Filter soda tap has two functions. Standard cold to warm tap water is dispensed using a mixer lever on the right-hand side, while the control on the left-hand side activated chilled, filtered water in three option – still, medium or sparkling – exactly to taste. In addition to that – and this is an absolute first for such drinking water systems – the volume of water can be pre-set using the measuring cup function.

This is actually a perfect example of the Multi functionality device. This i will discuss When I am going to describe the Fork Card Totally. In general the affordance and signifiers  are going su[pporting the technical advancement of the product.

The  affordance to  set the temperature                                              the faucet and Nozzle  Controling the speed of water Sprinkling

## 8.4 Example 4-

INK is the solution to overcome the problems caused by pre-existing incomplete electrical systems or environmental limitations: a patented LED lighting system that includes multiple items working from the same concept. The flexible cable can be mounted as stretched system to enlight arches, beamed and ceilings of value, or can be inserted inside ceiling/wall modular extrudes to create a branched path on the surface. The cable acts as a conductor on which it is possible to hook the various compatible devices, allowing the adoption of various lighting solutions, even in places where it is not possible to install light sources on the ceiling.

The main problems are not seperated or completely distinct. they are all connected to each other.
Problems were-
Obstacle in Connectivity-
Mess of wires
Bad aesthetics
Time of installastion.
So, to solve alll the problems Ink provides only unique solution of adding gadgets directly to the given simplistic Black frame.





the chess tactics here used is basically an elemination of defender. The more conveninent specific examples can be the demolition of pawn structure. in the next page i am going to sdescribe how it can be express by chess tactics.
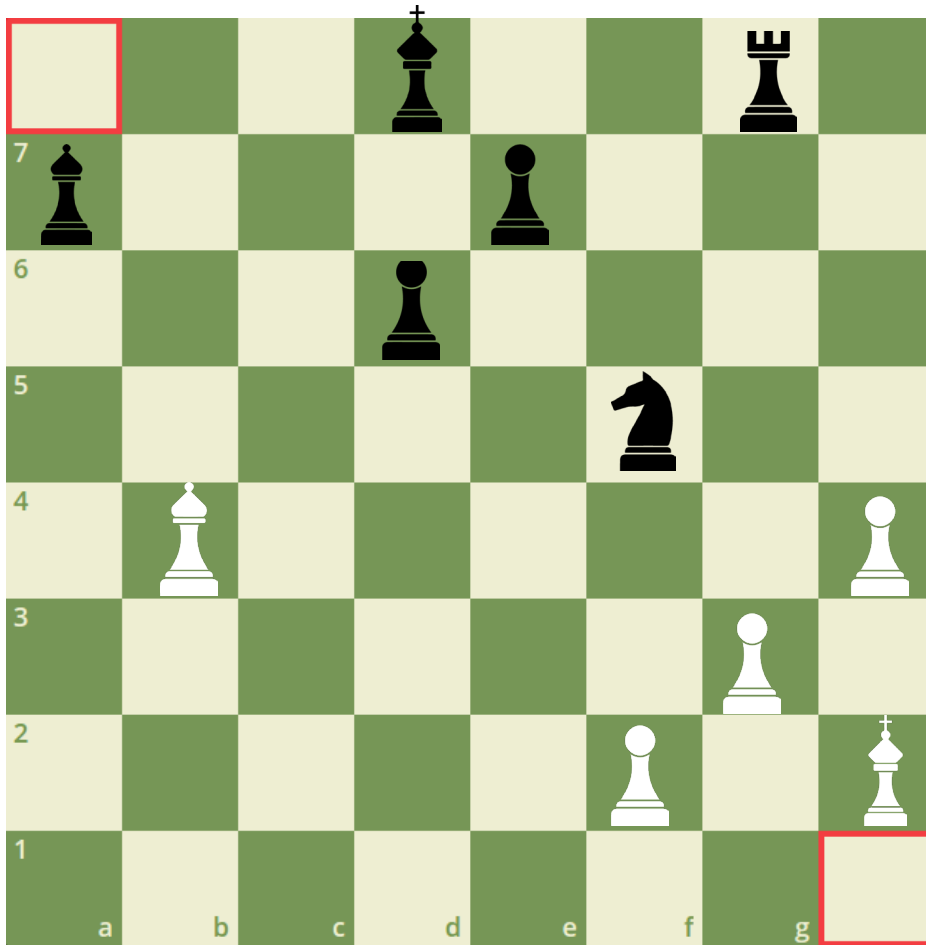
There is a pawn structure f2-g3-h4 is a strong unit to capture.
Black has multiple options to attack
No1.Nxh4 , No2 Nxg3 or Rxg3 Or No3 Bxf2.
In these 4 options, if any how g2 or h4 pawns attacked the attacking pieces are doomed, so best option is to attack f2 by the bishop, then automatically g2 and h4 are free pieces to kill.
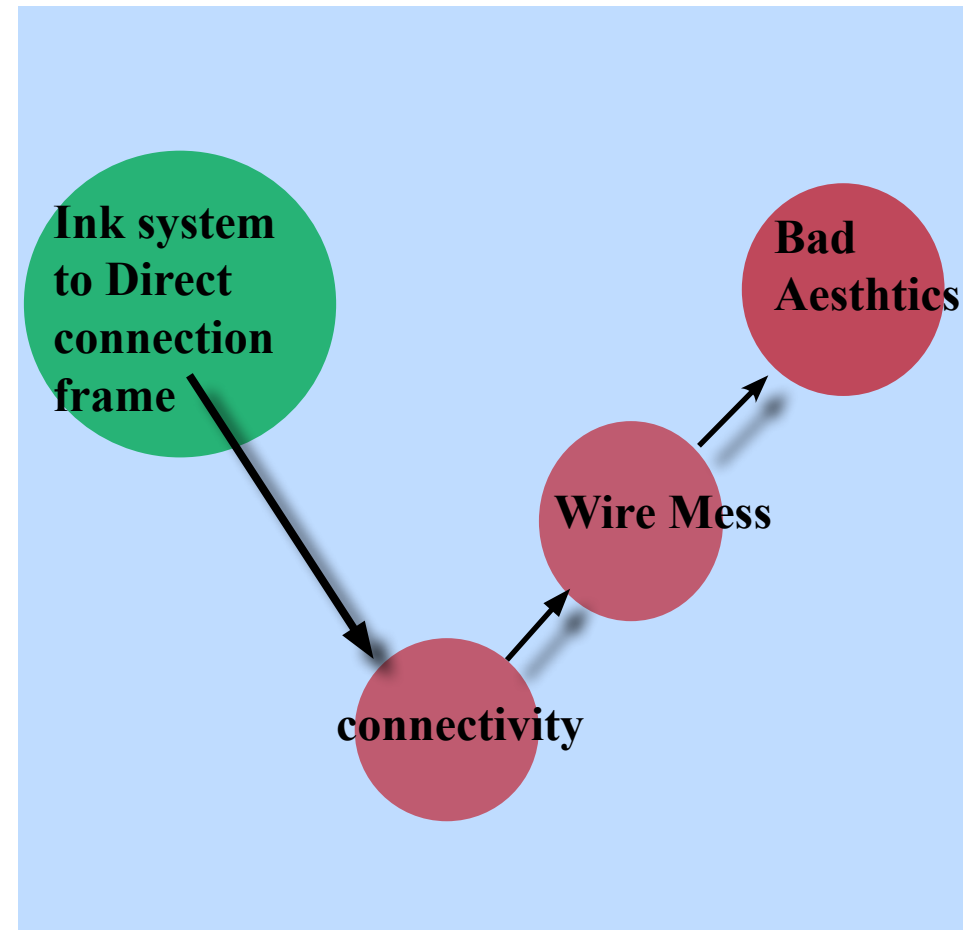
the same thing happens for the electrical connection extensions. what ever a person can do without solving the wire mess and connectivity problem, the problem can not be permanently solved. So better to solve the main connectivity problem.
 so I think INK is a perfect example for eleminastion of the defender.

## 8.5Example -5

Toio- robot toy

Toio is a "hands-on toy platform" designed to foster children's natural ingenuity and playfulness. They can place blocks or other toys onto simple cube-shaped robots and move them about. This unique concept offers various forms of play, such as battle, racing, sports, art, and programming, selectable just by changing the cartridge. Thanks to its simple visual presentation, the design focuses children's attention on discovering more ways to play and have fun with their toys.

This Toy is a competetor against digital medium games. The digital mediums Games give a small challege and then the user gets joys simply solving that challenge.  so every time  the user finds some thing new to create with Toio , Toio actually upgrades its level.



So it has atleast  two types of chess tactics which are  used for this toy.  The toy has enormopus scope to learn so  it can be a nice example of skewer tactics where if the user does not use the object to its full potential, still its a good to buy for a teenager or a child . If They can learn atleast 20 percent of the products total capacity. then also they will  be benefited.

The product can be compared as digital lego tool, which gives the push to the user to build up new habits. this product mostly builds up challeges with new sensors and new programs. So the product makes the "Elephant Eating"- if you need to eat the elephant, elephant needs to cut into small pieces.   we will discuss this product  vividly while we make the cards.

the other examples I dont describe much just putting  results  of the Analysis-
6.Stacking Shadow – choppping board
This chopping board set is a kitchen helper. The three boards have different functions: the first is designed with a groove to gather the dregs of cooked food; the outer circumference of the second cutting board is raised to pre-vent the juice of fruits and vegetables from overflowing; and the third cut-ting board is for fish and meat, with an anti-slip particle strip in the center to increase the resistance of the ingredients and the cutting board.

The techniques  which relevant for this product are the
1.Fork- multiple action it is doing.
2. Synchronized Attack- the cutting experience  increased with hardness

 7. Electric water heater
Problems of water quality in many areas lead to the buildup of limescale in water heaters. This, in turn, leads to performance degradation, a slowdown in heating speed and an increase in power consumption. In order to solve this problem, the VIOMI electric water heater uses replaceable electronic magnesium rods to absorb and remove the limescale. The heater is compact and attractive in design, and very easy to operate.
Fork-  magnesium ion  rod- solves two problem.
8. 3M secure fit- security helmet

9.The 3M SecureFit™ safety helmet is designed for use in construction, oil, gas, utilities, forestry and manufacturing. It can be tailored to multiple different applications and used with a range of hearing, eye and face protection products. Ergonomics show in its light weight, improved protection, and a shorter brim for better visibility. It provides excellent ventilation, fit and stability due to an innovative suspension system. The form language is inspired by sports. The geometry consists of a rigid reassuring structure, signaling safety. Minimal material use and easily separable parts make recycling easy.

10.The Lockin camera is a wireless HD security camera. By connecting the camera to the base station using Wi-Fi, the user can monitor their home from anywhere via the Lockin app. The magnetic joint of body and base allows the user to adjust the camera angle easily. The 1080HD image supports zoom, while wide viewing angle deliver better night vision. Advanced noise-reducing technology can minimize background noise, achieving clear two-way communica-tion.
Technological advancement plus synchronized attack.
11.Discovery ii- all new fine pitch tv- led tv

The Discovery II fine-pitch LED TV, with high-definition and an ultra-wide viewing angle, is designed for indoor close-up viewing, such as in business meet-ing rooms, conference presentations, home theaters, etc. Compared to projectors, Discovery II LED TVs not only prevent any shadows from being projected onto the screen, they also provide a better viewing experience in terms of brightness, color saturation and signal stability. The pixels can be up to 4k after the screen is assembled. The integrated bracket makes LED TV possible.

12.spider smart Led screen with stage art-

The Spider Smart stage-art LED screen is the leading product in the rental activity business. It cleverly integrates a "ladder" function on the handle, allowing maintenance personnel to climb up and down the back of the screen with ease, for quick and easy maintenance. It can be installed as a flat or a curved screen with ±3°and ±6°. You can create many creative shapes for rental activities, such as large shows, live events, and music festivals.

13. MINI pneumatic Air hoist-

Pneumatic air hoists are often utilized in areas where there is a risk of explosion but have also a much higher power-weight ratio than electrical ones. The MINI 500 is more compact but has a higher lifting speed and 24/7 steady-state performance in assembly lines. The convex surfaces are synonymous with the power of compressed air. The combination of aluminum with reinforced plastics keeps the weight at 20 kg, essential for mobile one-man operation. An ergonomically optimized control ensures highly sensitive maneuvering procedures up to 500 kg. Via NFC chip the service and maintenance manuals are always available.

Chess tactics not applicable.

14. Multi slices digital tomography- CT scanner.

A unique optimized operation flow, convenient maintenance, ultra-high definition image, and reliable application are the main features of the ANKE CT Scanner. It can be used to scan the full body or just the heart. With the lastest robust image reconstruction system, it displays the optimal image after balancing image quality with X-ray dose. The scanner aperture has a convex shape to reduce the sense of claustrophobia among patients. This patient-friendly design is a part of the ANKE care philosophy.

15.Plato- Chair.-

Plato, the new chair from designer Jasper Morrison is a rigorous, minimalist piece that is both versatile and sturdy, and well-suited for both indoor and outdoor settings. Understated and with a neoclassical inspiration, hence the name that references one of the fathers of classical philosophy, the Plato chair represents a harmonization of different spatial spheres.

15. LIFETREE high power laser laser theory system.

As a non-pharmaceutical, high-efficiency and easy-to-operate rehabilitation device, the high-energy laser physiotherapy system can make full use of the bio-stimulation effect produced by the beam, deeply penetrating to the soft tissue under the skin and the inside of the joint, so that the tissue can better absorb the light energy. Increased red blood cells and hemoglobin promote blood vessel growth, accelerate tissue repair, and reduce or eliminate pain. It is safe, reliable, painless, and has a fast-acting effect. The software enhances the management function of the treatment data, making the data clear and easy to trace.

https://ifdesign.com/en/winner-ranking/project/lifetree-high-power-laser-therapy-system/282730

16. Lenovo smart clock-

Lenovo

The Lenovo Smart Clock with Google Assistant brings you the best of Google all in one place. Featuring a beautiful 4-inch display and hands-free functionality, the Lenovo Smart Clock is the smallest Google Assistant device of its kind. The modern design will complement any bedroom perfectly, offering users a convenient way to control their smart home, set alarms, check the weather, and get a heads up on traffic, all without needing to get out of bed or pick up their smartphone. The Lenovo Smart Clock seamlessly integrates the most essential information needed to start or end any day with just a simple voice command. Trap & Attraction.

17. Logitech Tap is a touch control display that makes video collaboration easier. Featuring a 10.1-inch touchscreen, HDMI input for content sharing, and robust cable retention, Logitech Tap is designed and engineered for reliable convenience in the meeting room. Tap is part of pre-configured room solutions for major collaboration platform providers such as Google Hangouts, Meet Hardware, Microsoft Teams Rooms (formerly Skype Room Systems), and Zoom Rooms. Like other Logitech conferencing equipment, Tap is built on open standards, enabling a broader set of integrations.
Habit Builder + Clearance

18.  Singles Slow Brewer Thermo Jug-

Thermo Jug

The new SINGLES thermos jug from Danish manufacturer Zone does what all thermos jugs do – it keeps hot drinks hot. But, with its ultra-simple lines and four appealing colors, SINGLES does it a little more beautiful than its competitors. Also, by adding the matching filter, you get a lovely slow coffee brewer, which may be the best thing about this thermos jug. The filter is made from the same materials and with the same design as the jug. In perfect union, they become your new slow coffee brewer, which frees up space in the kitchen cupboard as well as giving you a seriously good cup. A matching tea filter is also available.
 Synchronize Attack+ castling
 19. The very small yet powerful PCs of the C60XX series are a good example of the computing 'brains' behind the "Internet of Things". As a gateway to the Cloud, they collect and process large amounts of data. The high quality of the design communicates the technical innovation of the product. The sleek graphic design of the cooling fins and the ventilation lines in the housing give the product a unique look and richly earned it an iF gold award!
Not applicable..

20.\Docol Play shower Sprout

With Docol's new Play shower spout, users have one shower with two usage options. The upper spout concentrates the water, channeling it to a high-tech flow direction controller, which produces a single jet that wraps around the body without splashing. The low spout is designed to let you keep your head and upper body out of water, allowing for a lower-body shower.

Synchronized attack.

21. Click Bracelet – bracelet

This stylish but ingeniously simple bracelet is a circular tube of gold with a hoop on the end that hugs a diamond to fasten. There's a satisfying click when the hoop slots over the diamond. Thus, the designers have dispensed with the fiddly bracelet clasp, and created a piece of jewelry that is both intriguing and alluring.

Casteling + fork

22. The HP Envy 13" unites the attractive natural traits of wood with an exceptional business laptop. The palmrest and trackpad surface are made from wood veneer, either birch or walnut, which provides a warm and natural surface with uninterrupted woodgrain. HP could have stamped or etched metal with a woodgrain pattern, but they knew this wouldn't be good enough. Their designers made sure that the surface was not just attractive to the eye but also pleasant to touch, provides a good navigation experience, and maintains the texture of wood. It was a challenge to make sure that the wood surface withstands environmental testing for humidity, sweat, etc. so that it maintains its form and feel over time. This is how a premium laptop should feel.

Discovered attack

23. Sinonimo Essential is a set of tools for making espresso coffee in modern homes, offices, and studios. Most currently available home espresso tools are fragmented and incoherent for users due to legacy design for commercial settings such as cafés. Essentials is the first tool of its kind designed specifically for the growing home espresso market. The finish is both tasteful and durable thanks to the use of high-quality materials such as hybrid coated die-cast aluminum and hydrophobic coated oak.

Discover attack+ castling

24. Ceiling Mounted Temptetrature sensor-

Azbil's ultra-slim (just 40 millimeters high) ceiling-mounted temperature sensor is an ingenious piece of building technology. The smooth surface, the minimalist design form, and very easy installation turns a fixture into a feature. Its ultra-thin profile means that numerous sensors can be installed without disturbing the aesthetics of a room. The Flow Path structural design achieves high accuracy and responsiveness despite the compact size. Furthermore, the one-touch installation greatly reduces setup time.

25. Clinical design urine testing system.

Urine Testing System™ is a multi-award winning system for digital point-of-care urine testing. Healthcare professionals connect the patented UTS-10 Cap™ to a UTS Tube™ – exposing the reagent pads to the urine sample – and load the module into the UTS Digital Analyser™. Standardized digital results can be viewed and saved into the patient's electronic health record. Traditional dipstick methods have remained unchanged for decades and results are prone to variation with risks of spillage and contamination. Urine Testing System™ is easy-to-use and a more accurate and hygienic method of urine testing

Analysis and a small list of the tactics found in the products.As i have mentioned that all products are taken from If Design award. the products are widely varied from different types of fields, like kitchen gadgets, electronics, office utensil, Bathware, sportsware, gaming, Medical device  etc, this makes the distribution more un biased and vaired.

All products are analysed from the descrip available in if design award site, you tube videos available and the manufacturers website. all the products link is given in the web site. Instead of putting all the photos and product description I am putting the Excel Documents of my analysis. Because same card analysis will be a repetetion of the previous work.

| Product | Type of the product | Type of tactics used | Type of Field | Explanation Status |
|---|---|---|---|---|
| Stacking Shadow | Kitchen | **Synchronized Attack** | Grip, Collection of dreg, better cutting experience | Explainable |
|  |  | Fork | Vegetables, fruits, meat and Fish |  |
| Electric water heater | Home Appliance | Fork/ double attack | Magnesium rod used also as scale remover | Explainable |
|  |  | Undercover | Simple look , easy to operate |  |
| Dragonfly- Infrared Thermometer | Medical | Discover Attack | It  looks like a dragon Fly light weight, ergonomics. | Explainble |
| Security fit -helmet | Sportsware | Synchrionized work | using with a long range of hearing | Explainable |
|  |  |  | Minimal material use and easily separable parts make recycling eas |  |
| Discovery ii- all new fine pitch tv- led tv | Electronics | Synchronized Attack | color stability,   4k screen resoultion, integrated bracket | technological advancement not explainable |
| Looking Camera | Electronics | Synchronized attack | zoom, wide angle , noise cancellation | technological advancement not explainable |
| Mini Pneumatic Air hoist | Industrial | not applicable | Not applicable | not applicable |
| Digital Tomography-CT Scanner | Medical | not applicable | Not applicable | not applicable |
| Plato -Chair | Furniture | UnderPromotion | Simplistic design, minimalistic, varsetile, Sturdy | NOT sufficiently Explained |
| Lenovo smart clock- | Electronics | Trap, attraction | Easy to operate, voice assistant | explainable |
|  |  | Synchronized attack |  to make smart home |  |
| Robin C DSA | Medical | better exchange | improved the Preformance to price | Not explainable |

Some of the examples are highly technology oriented and that can not be simply described with the cards. Some examples are highly complex in funtionality which can not be described or analyzed with the specific knowledge of that domain. So those type of examples are mentioned as not applicable or not explainable catagory though, I think better knowledge from the field will help to understand   the design choices of those products.

| Product | Type of the product | Type of tactics used | Type of Field | Explanation Status |
|---|---|---|---|---|
| Thermo jug | personal utensil | Simplification | homogynization of all parts | Explaniable |
| C0615 Industrial Computer | Electronics | not applicable | Not applicable | Not explainable |
| Click Bracelet – bracelet | jewellery | Fork | dual purpose of stone + lock | Explainable |
| | | castling+ hidding | lock is subtlly placed | |
| HP ENVY laptop | Electronics | Discovered attack | wooden framing | Explainable |
| Espresso Making Tools- | Kitchen gadget | Discovered attack | different material - hydrophobic oak | Explainable |
| | | | & die cast aluminium | |
| Kimera headgear | Sportsware | Advanced pawn ment in ergonomics, and weight reduction, best fitting | | Explainable |
| Ink lighting System | Interior Electrical System | Demolition of pawn, o connection regarded problem, better interior design | | Explainable |
| | | Elemination of defender | | |
| Air luna | interior electrical System | Synchronized Attack | dual functionality | Explainable |
| Siemrens ceramic refrigerator | Consumer electronics | Discovred attack | Furniture look | Explainable |
| Elo smart Steam | Kitchen gadget | Synchrionized attack, interference | sustainable cooking,  divertion of malodor | Explainble |
| blanco kitchen faucet | kitchen gadget | Double attack , synchronized attack | all 5 use of water in one | Explainable |
| Toio game | Gigital and Gaming | Trap attraction | Small challenges , atraction , step by step rewarding | Explainable |
| sero lifestyle Tv | electronic Entertaiment | Discover attack | | Explainable |
| Kare- medical unit | medical compartment | interference | nlo contact with the patient | Explainable. |
| Suspension drain System | drainage | castling+ hidding | working but smooth look | Explainable |
| Geometry gaming console | Gaming | Discover attack | giving retrolook of a video game | Explainable |

Among all the examples some of the cards have been used multiple times and very evidently, in some examples multiple cars have been used simultaneously. Over total 48 examples in total I took as the domain of my observation 42 has been explained by the cards. so almost 87.5% examples are explainable with the cards.

Mostly the technologically upgraded cards are much difficult to analyse. among this all cards, as we frequency wise the top 8 cards we describe and build with some set of instruction to the designers.

| CARDS | No of Examples |
|---|---|
| Fork or Double Attack | 5 |
| Synchronized attack | 7 |
| Discovered Attack | 4 |
| Trap + attraction | 4 |
| Elimination of Defender | 3 |
| Interference | 2 |
| Zwischenzug or reuse | 3 |
| Castling | 3 |
| Simplification | 2 |
| Under promotion | 1 |
| others | 5 |

# 9.What are the cards important and how they took the Shape?

looking at this scenario of the useage of the cards i tried to figure out what can be the mostly used Tactics and among them which combinations are going to be most useful.

According to me, the most used cards are

1. Double Attack or fork.
2. Synchronized attack or battery
3. Elemination of The Defender
4. Zwischenzug
5. Discovered Check
6. Sacrifice or Lure Along With Trap
7. Castling
8. Interference

all this tactics has been discussed before but Now i want to ellaborate That how we can the process of use in chess can guide it into chess also.. firstly I go

## 9.1 Fork- All Rounder

Steps in Chess-

1. Check If two of the pieces are at the same time in the radar of a piece, like if my knight can can attack queen and bishop at the same time.
2. if they are not actually in place, try to lure them to come to a place where it can be attacked or support your attacking piece so that it cannot be killed by the opponent.
3. if one piece moves and that can support the other piece it is difficult to kill the other piece.
4. safe retraction of the piece.

steps in design

1. Designed product can simultaneously solve two problems. for examplett

Airluna- what are the possibilities that can serve more problems other than lighting in the room. so to question what are basic electrical thing operating during a corporate meeting. ( screen, Air conditioner, microphones, cctv). Among.

2. selecting the two operation (Here air purifier and lighting) make it capable of solving both of the operations. here the light has been increased in volume to accomodate all the features for air purification.
3. The One operation can not effect the other operation.
4. With both operation , it should not affect the longivity of the product. For example If the light is on , the heating effect of the lighting should not make the air quality bad.

5. Some tactics And Inspired cards.
**Card 1** based from double attack or fork tactics of chess.`
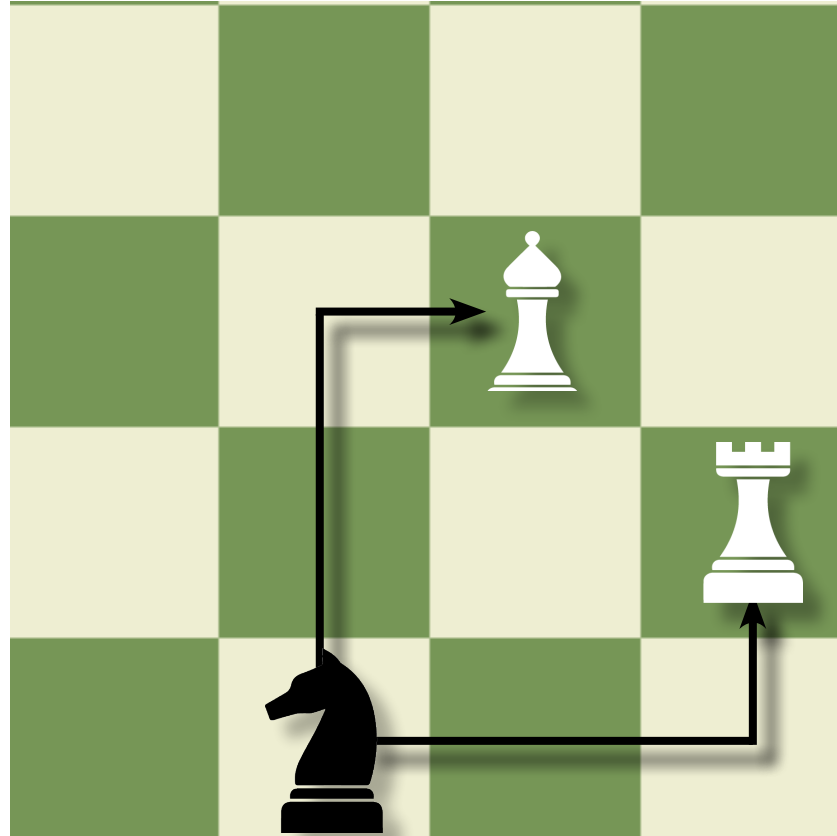


## Fork or Double Attack;

Basically in this procedure on feature can serve two utilities, or function.
Increases the versatility of the product.
what are purpose it can solve
 1. Space reduction / less carbon footprint
 2. Cost effectiveness
 3. Ease of operation.
 4. Less Time requiremen to do the problem
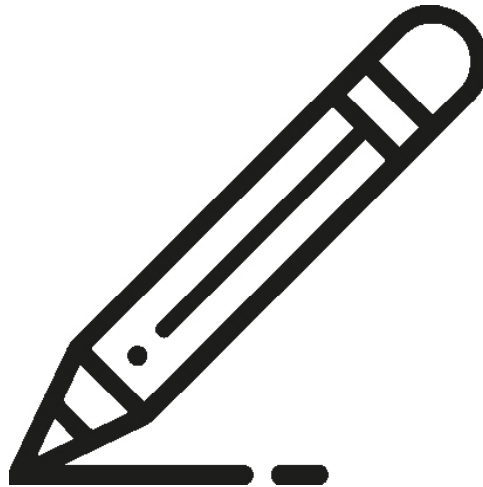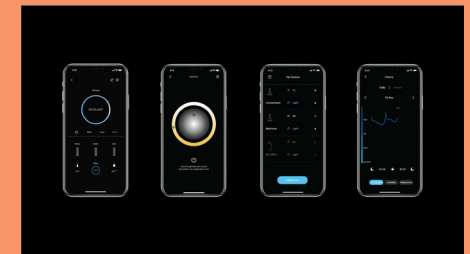 5. Make a co relation of the components or functions.

## How to Use this Technique

 1. main objective of the product
 2. List down tyhe functions desired to be multi tasked.(According to occurance, timing, field of use) for example- if its kitchen product what can be the similar operations at that time in kitchen. if its a knife , what are the other operation can be done with a metal blade. during cutting and cooking what are  other things need.
3.Check the occurance, co-relation, and signifance for the closesty operation
4. check the features needed to add in the product
5. Put recognigable signifier or affordance
6.check the time of retract
7. Similar experience or easier experience or not.

# All -Rounder

This card is used to add more functionality to the product or it's components more coherently, to make it more versatile.

## Benefits

1. Space reduction / less carbon footprint
2. Cost effectiveness
3. Ease of operation.
4. Less Time requiremen to do the problem
5. Make a co relation of the compo-nents or functions.

## How to Use this Technique

1. Main objective of the product
2. List down tyhe functions desired to be multi tasked.(According to occurance, timing, field of use) for example- if its kitchen product what can be the similar operations at that time in kitchen. if its a knife , what are the other operation can be done with a metal blade. during cutting and cooking what are  other things need.
3. Check the occurance, co-relation, and signifance for the closes operation
4. Check the features needed to add in the product
5. Put recognigable signifier or affordance
6. Check the time of retract
7. Similar experience or easier experience or not.

AIR PURIFICATION
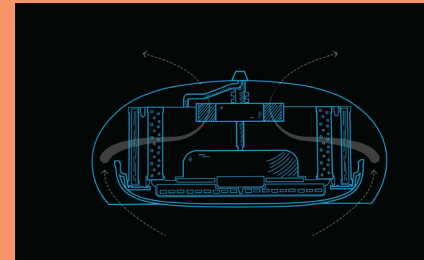
LIGHTING
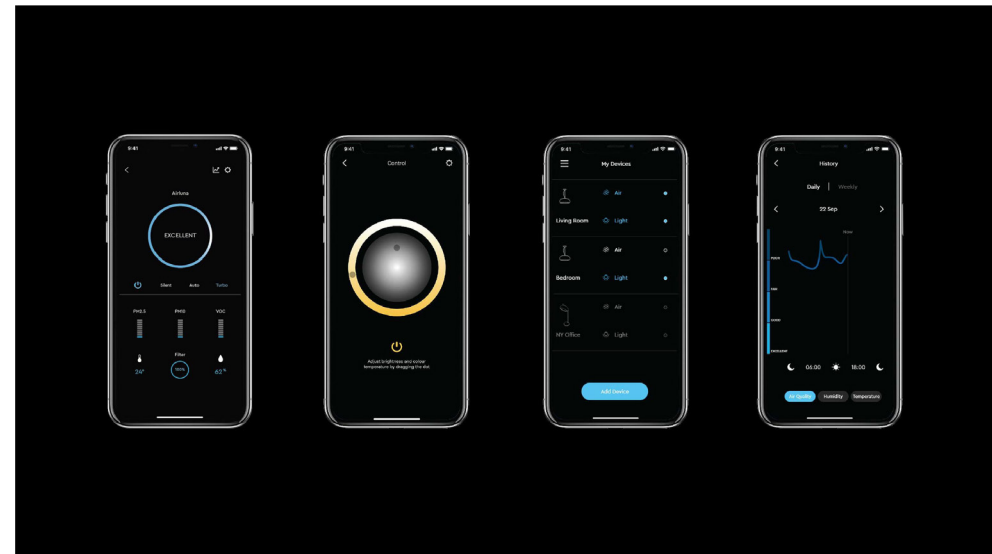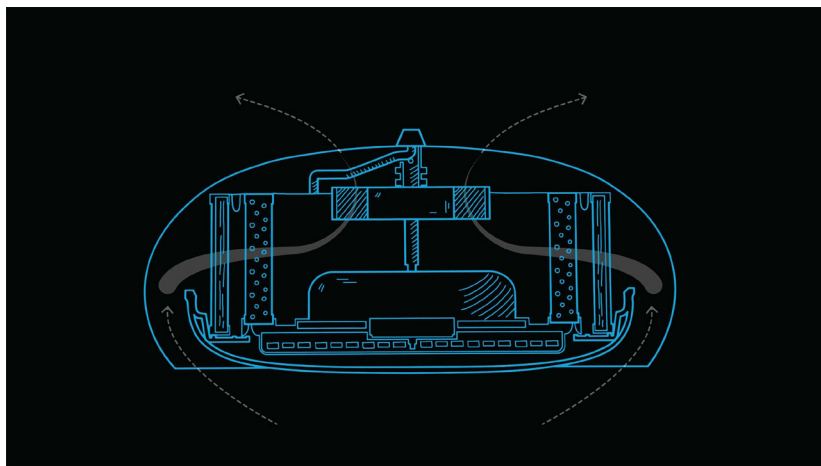
AIRLUNA- Air purifying  lamp-
ASA Innovation & Technology Limited
Airluna is the world's first air purifying lamp. Equipped with patented PACO nanotechnology, Airluna can destroy 99.9% of viruses, including microbes even tinier than COVID-19. The device also breaks down the molecules of harmful chemicals and odors into harmless elements. PACO technology can last up to 10 years, greatly reducing replacement filter costs and the device's environmental footprint. The Airluna app lets users can remotely control and monitor indoor air quality. Other benefits include Airluna's space-saving design and contemporary form factor, plus its inge-nious use of airflow to lower the heat of the LED, effectively
https://ifdesign.com/en/winner-ranking/project/airluna/318217

# BLANCO EVOL-S Pro Soda & Filter
Kitchen faucet
BLANCO GmbH & Co. KG

With the Blanco Evol-S Pro Soda &amp; Filter users can get chilled, filtered, and still or sparkling water directly from the tap. In fact, it's an all-embracing 5-in-1 drinking water system. This is because the Evol-S Soda &amp; Filter soda tap has two functions. Standard cold to warm tap water is dispensed using a mixer lever on the right-hand side, while the control on the left-hand side activated chilled, filtered water in three option – still, medium or sparkling – exactly to taste. In addition to that – and this is an absolute first for such drinking water systems – the volume of water can be pre-set using the measuring cup function.

Airluna

Air purifying lamp

ASA Innovation & Technology Limited

Airluna is the world's first air purifying lamp. Equipped with patented PACO nanotechnology, Airluna can destroy 99.9% of viruses, including microbes even tinier than COVID-19. The device also breaks down the molecules of harmful chemicals and odors into harmless elements. PACO technology can last up to 10 years, greatly reducing replacement filter costs and the device's environmental footprint. The Airluna app lets users can remotely control and monitor indoor air quality. Other benefits include Airluna's space-saving design and contemporary form factor, plus its ingenious use of airflow to lower the heat of the LED, effectively

**9.3Card 2 -Synchorized Attack-** is based from the Synchronized attack in chess or sometimes its called battery.
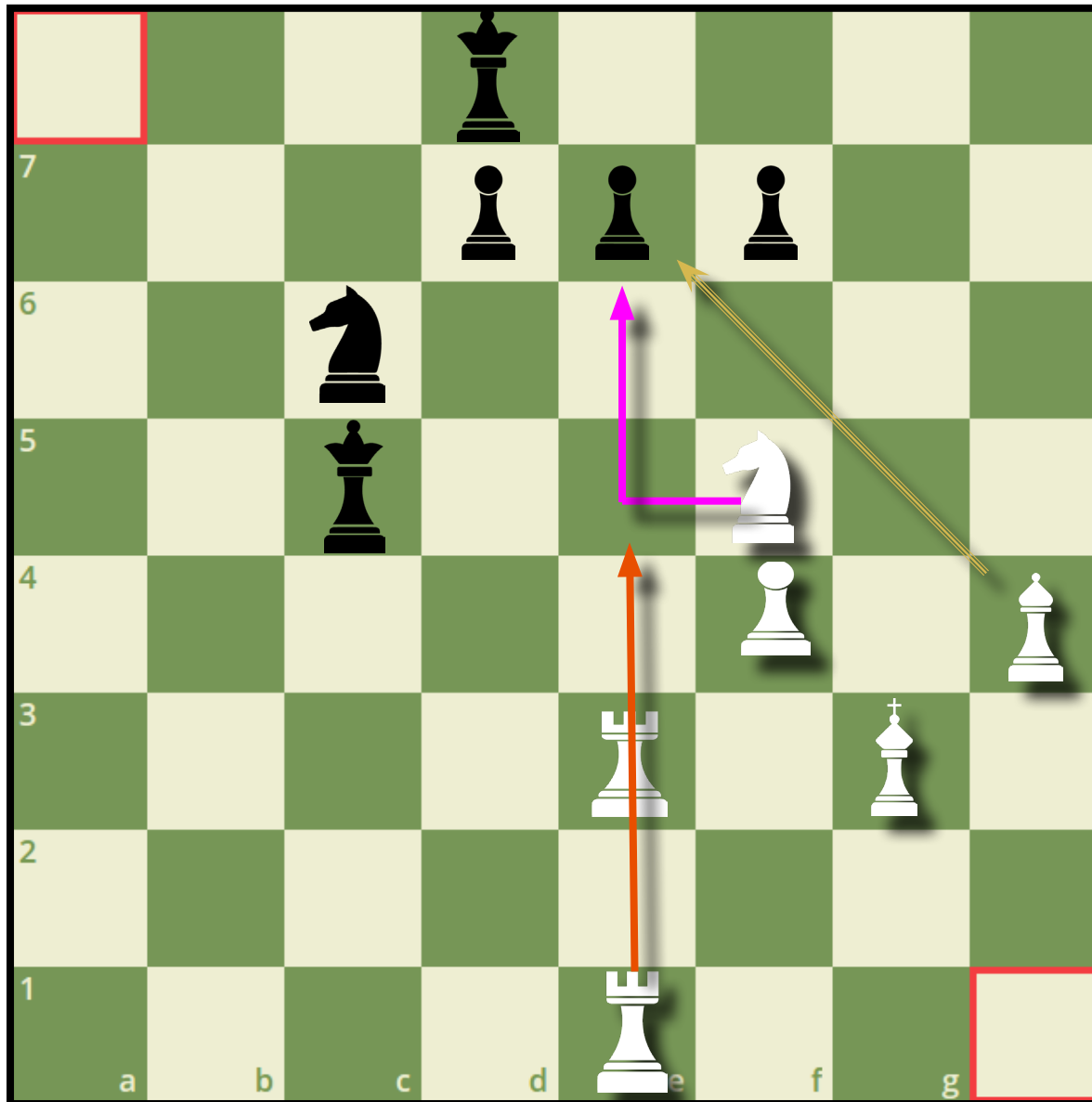
## Synchronized Attack:

In chess when a planned attack is created, multiple pieces goes in the same direction and focuses the point from different angle. IT has certain advantages in chess and more lethal than normal one piece and two piece attack.

In design also, we can take inspiration from this attack, in this case we can synchronize all the design aspects to the specific goal to achieve.

### HOW TO MAKE SYCHRONIZED DESIGN?

1. List the number of aspects that can tell the same design language.(Form, texture, Color, Mode of use, User inter face, Sound )

For cooking vessel - the material, the type of lid, Shape, volume etc

2. Try to make a familar object or experience as a strong moodboard. (look at the shape which are used for slow cooking , what type of lid used for the vessel, the other technology used)

3. try to bring most of the aspects towards that direction. (bring the possible factors inline who can be advantageous for the process the sorface can guide, how much oil or how much water needed, put possible signifier for that)

4. Bring new aspects in acount , mostly try to focus on users reflexive action during the function. make the new aspect connected to that.

5. Check if there any type of ambiguity in the action, try to avoid, may be ask a neutral person, about his view on that particular the feature.

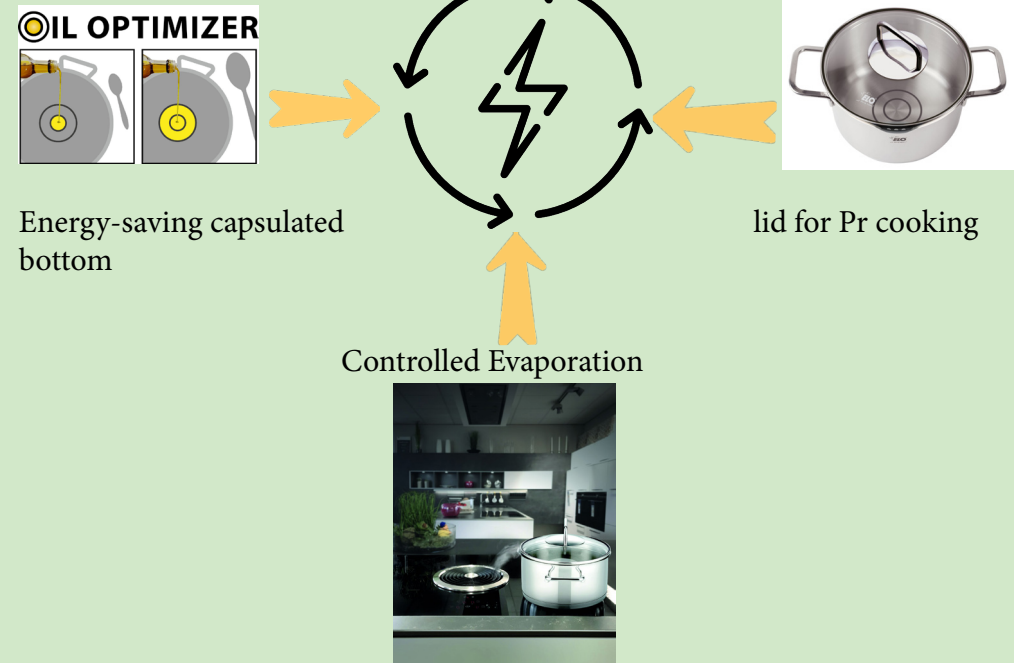## Synchronized Attack- This card basically used to achieve a goal using different components of the product.



**Benefits**
1. Increased efficiency
2. Better Design language
3. Reliability enhancement

**How to used the card-**

1.   Look at athe main objectives, Find out large objectives like- sustainability, habit buiding, consumer safety etc- which have multiple  concerns with the product
2.   Find out all related features that can help to achieve the goal.
3.   Make them alligned funcionally aligned with the goal
4.   Design their other features also coherently, like material, color
5.   Check overall interrelationship is not making any obstruction

## Example-



Energy-saving capsulated bottom

lid for Pr cooking

Controlled Evaporation



Controlled evaporation
New technologies require innovation. For state-of-the-art stoves with cooktop extractor fans, Smart Steam is the best match. Strategically placed lid openings and a clever indent in the rim of the pot ensure that the steam comes out on the side and goes directly into the extractor fan. Evaporation can be managed by slightly turning the lid. The grey silicone ring ensures a great fit so that unpleasant food odours are kept at bay.
Stainless-steel 18/10
Integrated oil dosing system (Oil Optimizer)
Energy-saving capsulated bottom
Measuring scale
Optimal for vitamin saving cooking with less water
Shock resistant glass lid
Dishwashersafe
Heat-resistant up to 240 °C
(with glass lid up to 180 °C)
Suitable for all types of hobs

**9.3 Card 3-Elemination of defender-** This is basically used for problem solving and this particullar example has been discussed before also.
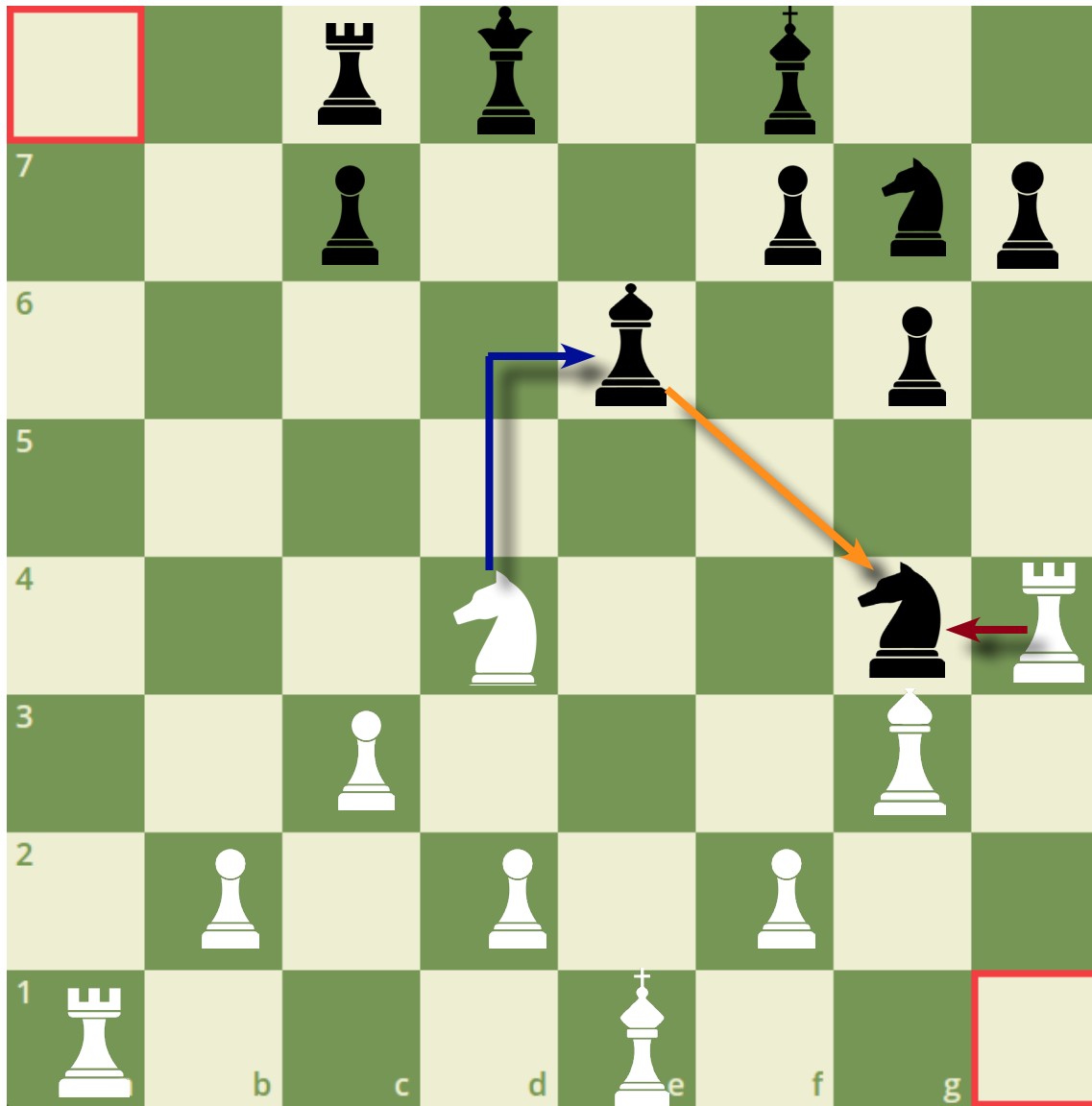


## Elemination Of Defender

In this process if a piece is supported by another piece, the defending piece needs to be killed first to make the piece which was previous a protected piece to make a free piece or unguarded piece .
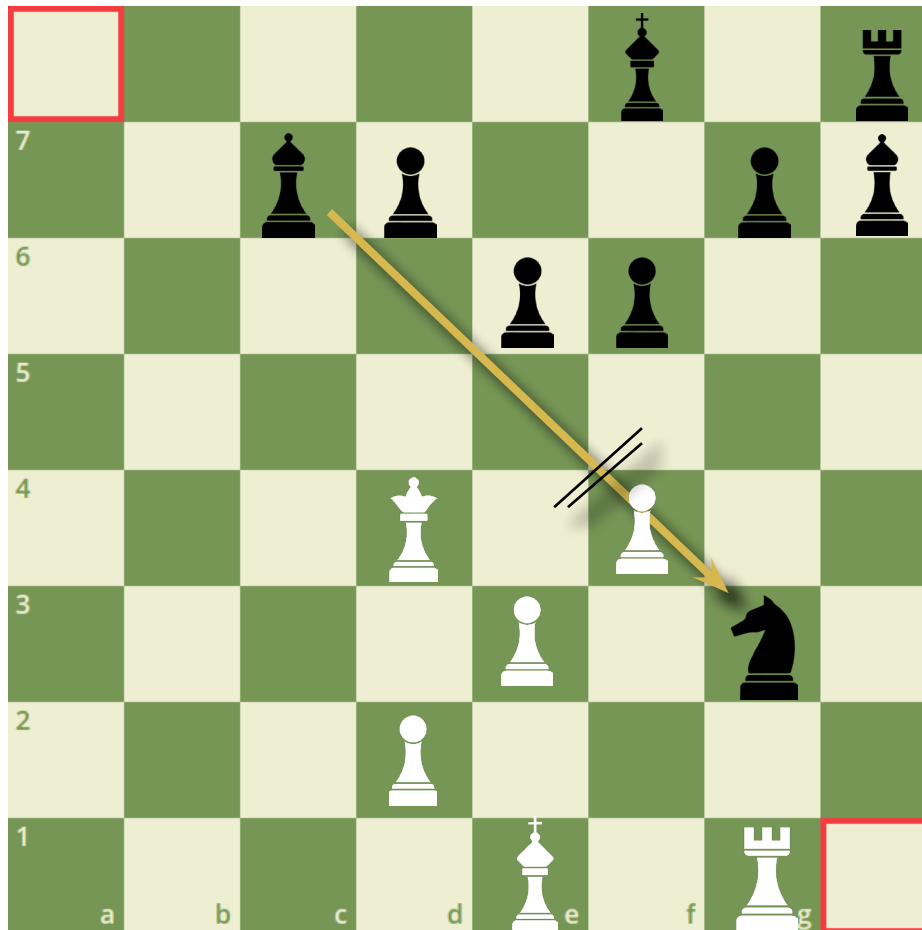
HOW TO USE THIS CARD:
1. try to find out the main issue to be eleminated.
2. how it is connected to the product, it uses or its manufacturing.
3. check all the connection behind the trouble,
4. deep dive in to it asking for reason(5y method)
5. Hit the original source of the problem by your design

EV CHARGING STATION

Hyundai Motor Group is preparing for a new era of human-centered mobility. Hyundai Design Center has developed the E-PIT ultra-fast charger which greatly improves user experience, by solving six problems typically found in current EV chargers: 1) bulky cables; 2) complicated operation and service use; 3) unclear charging status; 5) hygiene (especially important in the context of a pandemic); and 6) production and maintenance.



Taking cues from a traditional petrol station, this charging station puts the needs of the user first with easy operation and personalized interaction. Beneath the striking silhouette, all details are addressed from maintenance to hygiene. The designers have considered the entire experience and developed a solution that is simple, strong and approachable.

ELEMINATION OF THE DEFENDER- this card is basically used tr problem solving approach by eliminating , a particular process, a particular object .

HOW TO USE THIS CARD:
1. try to find out the main issue to be eleminated.
2. how it is connected to the product, it uses or  its manufacturing.
3. check all the connection behind the trouble,
4. deep dive in to it asking for reason(5y method)
5. Hit the original source of the problem by your design

Hyundai Motor Group is preparing for a new era of human-centered mobility. Hyundai Design Center has developed the E-PIT ultra-fast charger which greatly improves user experience, by solving six problems typically found in current EV chargers: 1) bulky cables; 2) complicated operation and service use; 3) unclear charging status; 5) hygiene (especially important in the context of a pandemic); and 6) production and maintenance.

Taking cues from a traditional petrol station, this charging station puts the needs of the user first with easy operation and personalized interaction. Beneath the striking silhouette, all details are addressed from maintenance to hygiene. The designers have considered the entire experience and developed a solution that is simple, strong and approachable.

**9.4 Card 4**-Blocker Another type of card which can be very useful forproblem solving.  the last card and  this one have lot of simillarity in their  application
the process of use is demonstrated very shortly here.

# Intersect.

In this Case  one of the chess piece is directly supported by another piece. in thier conection line if the opponent makes an obstruction with a less value-able piece then the piece standing ahead becomes un defended.
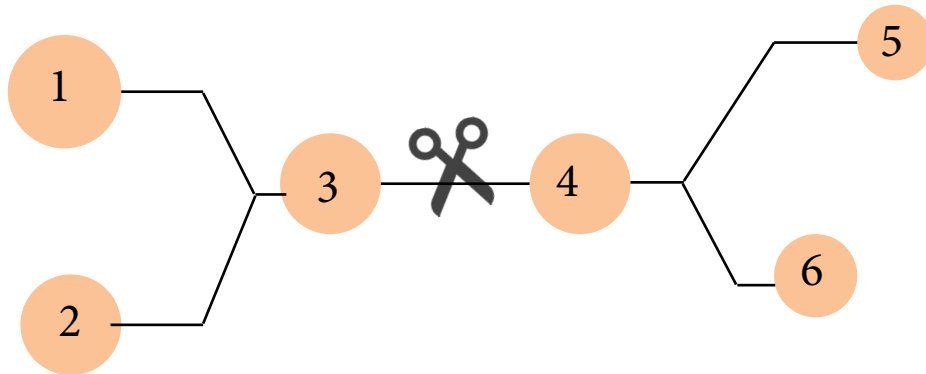
How to use the card
It is very similar to the previous card.
1. firstly treat the problem we need to check what the reasons behind the problem. a chanin of operation , or lot of things are connected to a very important but single thing. in the example of Kare module, the pathologist is connected to multiple steps and processes.
2. most closely connected reason  needs to be cut down.
In example of KARE module, the connection with the patient needs to be cut down.
3. instead eliminating ot the problem make a barrier between the problem and thre reason.
(it can  be totally automated but the process may fail, because the process the human intelligence and experience, so instead of making it totally automated, the deattachment done by air negative gradient.
4. check there are any other source of it or not
5. check the intersect is a fool proof or not.
Making it air negative gradient actually makes it independent of the users intelligence or desicions.

# Blocker

This card is used to solve a problem by cutting the link of two processes.



**How to use the card**
1. Look for processes related to the concern. Find out the process flow
2. where the process is a single channel flow path, identify that.
3. instead eliminating ot the problem make a barrier between the problem and thre reason.
4. check there are any other source of it or not
5. check the intersect is a fool proof or not.

**Example-**



Module
Mobile clinic module
20PLUS Co., Ltd.
In a pandemic situation like COVID-19, the demand for negative pressure wards has dramatically increased. It is possible to rapidly build an isolation ward by combining air tents, functional panels, and a negative pressure frame. The design addresses the requirements of functionality, cost and efficiency. In addition, it supports the emotional needs of patients and medical staff. The unique airflow structure guarantees bio-safety maintaining the pressure differences among hot, warm and cold zone in the ward. With the use of air tents, the whole ward can be shipped by airplane in an emergency.

AX System – Work Safety in Logistics
Warehouse traffic light system
Flying Objects
The AX System is an innovative AI-based, preventive traffic-light style system that monitors dangerous crossroads and sections in warehouses and industrial facilities. With the power of artificial intelligence, the AX System predicts dangerous situations or potential accidents and emits a distinct warning. The signaling system enables a more seamless operation of forklifts, speeding up workflow while reducing risk to human life.
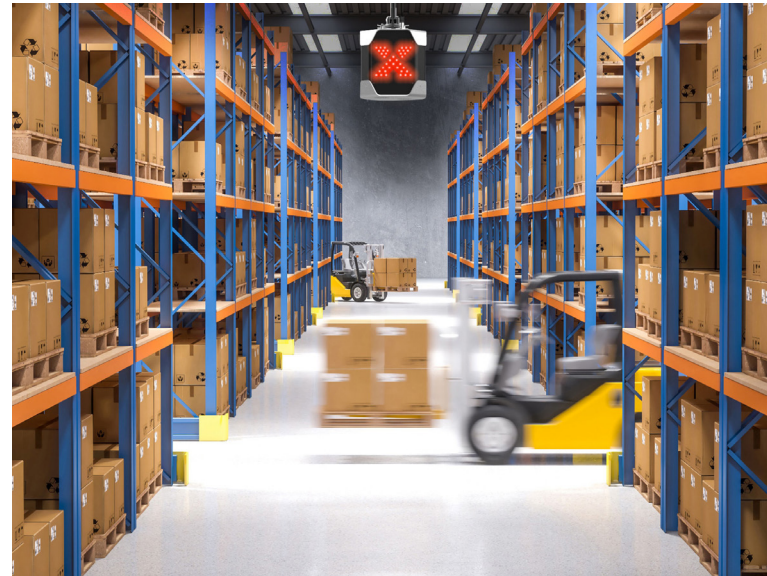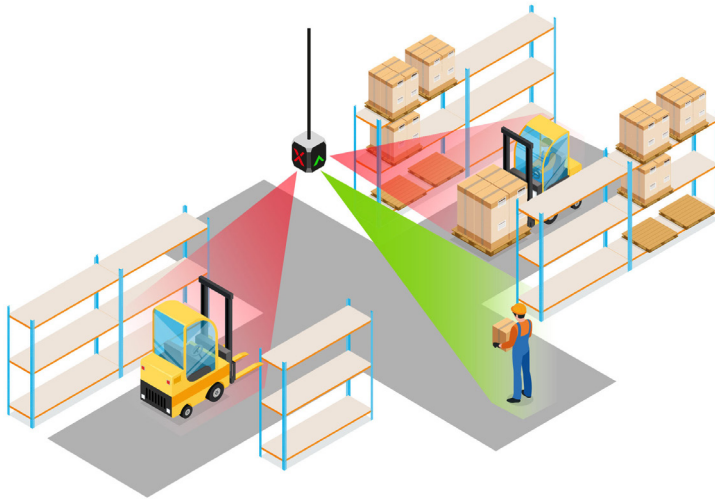
**9.5 Card-5 Habit Builder-**This can be used for Aesthictic modification or connecting user who can use it for a long duration. to insert a habit to common people this can be a great tactics inspired from chess.

TRAP-there are different type of traps used in chess to make pieces bound to a particular place. this trapping is a unique technique to first offer something as a sacrifice and when a opponent piece comes to take it, block all the passeges of its going back. it can be multi staged like give two or three sacrifice to catch a big piece.
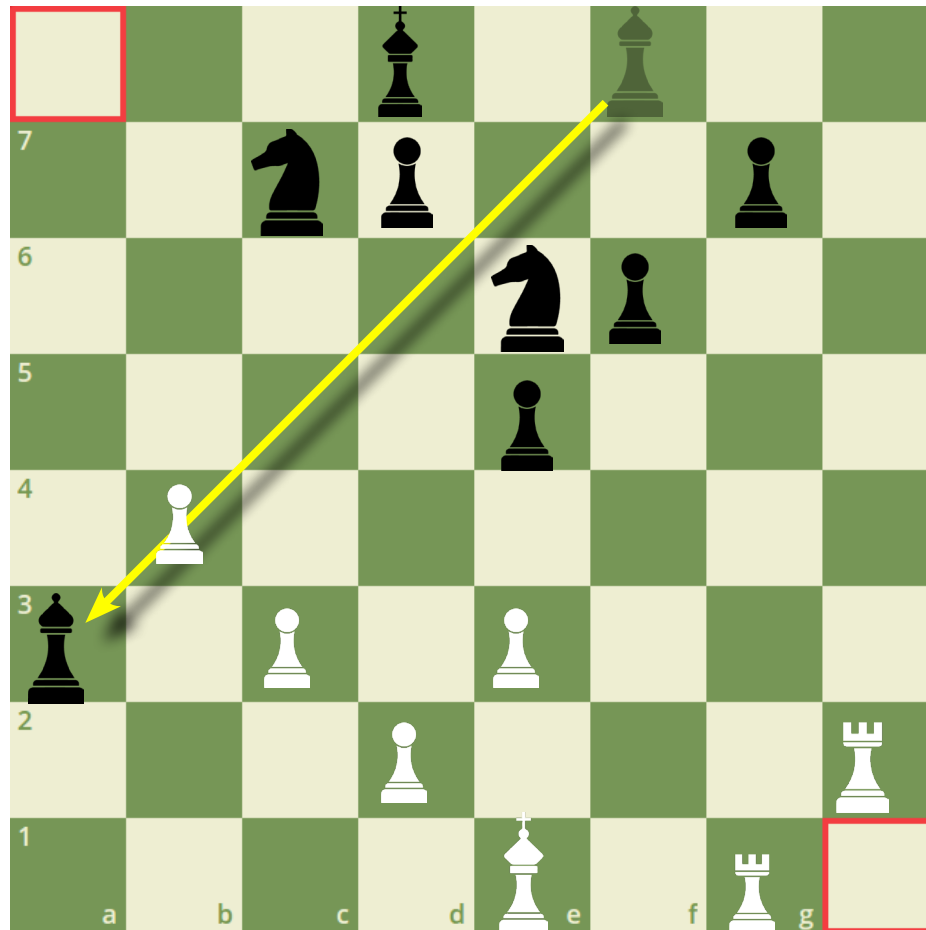


In design, this type of design is known as habit forming design. the product offers something to new to the customer to sense. either it should be so small or ignorant that the customer mind should not suspect or don't feel a big challenge and to it or take it.
then the products follow up with a new level of challenge which will again attract the user mind to do it. and these goes on and on suddenly after a period doing this thing becomes a habit for the user and the user will do it automatically. this type of product design is a parallel solution to the globally increasing digital world dependency.
the challenge what attracts the user needs to be precisely placed to create a subtle emotion in the mind of the user
let's discuss this with an example from if design award. This Example is Toio Robot toy
Toio is a "hands-on toy platform" designed to foster children's natural ingenuity and playfulness. They can place blocks or other toys onto simple cube-shaped robots and move them about. This unique concept offers various forms of play, such as battle, racing, sports, art, and programming, selectable just by changing the cartridge. Thanks to its simple visual presentation, the design focuses children's attention on discovering more ways to play and have fun with their toys.

The philosophy of Trap in design-

Toio is a preprogramed cube that can do different motions under the control of Bluetooth motion-sensing remote controller. Each cube has two wheels under it to make it moveable. Users can purchase different kits to play Toio in different modes, like the "game card" we bought for game console. Each kit has a special mat comes with the package, Toio can recognize the position on this mat by using the camera under the cube. For example, there is a kit called "Working Lives", customers can cut the paper that provided in "Working Lives" package into different shapes and attach them to the cube to create various of moveable creatures and enjoy the visual effects brought by Toio. The video below is a demo of what children can create with Toio's "Working Lives" package.
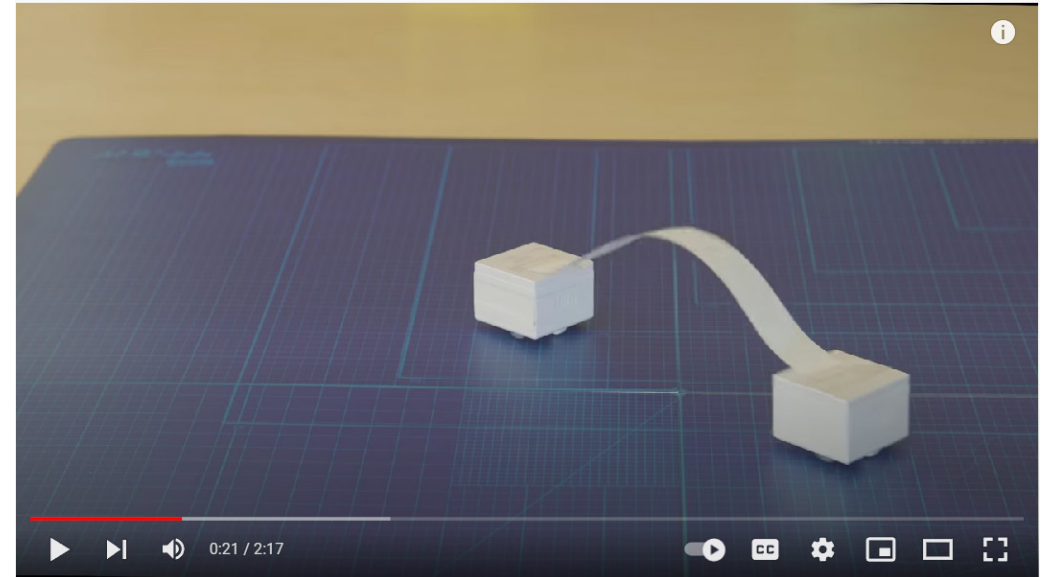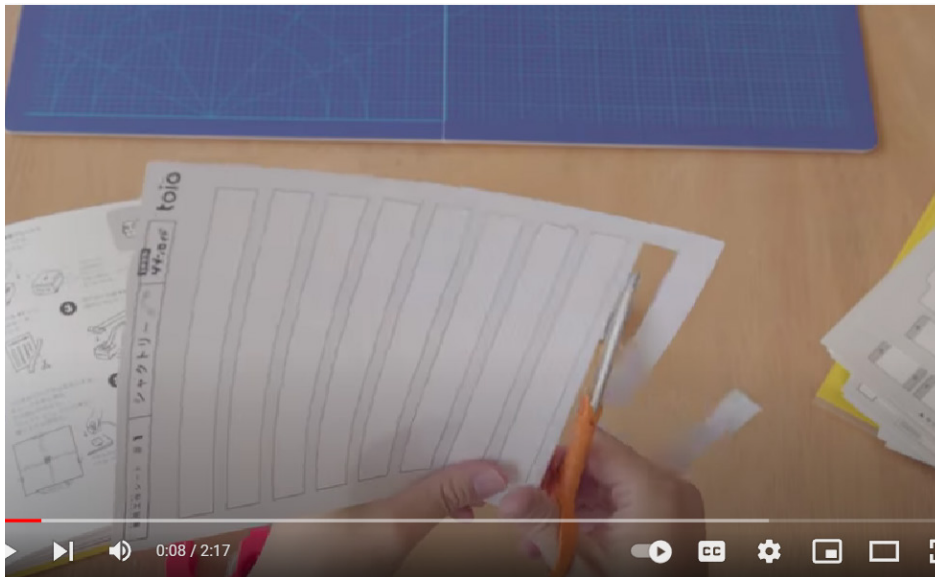


The simple way of attracting the kid or the teenager is to give a simple task.  Here He needs to do the Paper Cutting then connect the two cubes. the thing he needs to do is very simple in comparision with the products inner mechanism, actually the toy can come with the totallly connected but the designer intentionally kept the provision of the childs interacrion so he can connect the the toy. and step by step it has been increased.

Next level of challenge is to walking motion with toio , the cubes programing and complexity is completely hidden to the player or the user while, the sinplicity and versatility is infront of the user, who will be in love with the motion after watching this toy working. this attraction with the toy and eventually a world of electromechanical gaming in physical world will increase as an habit.

Now lets discuss what actually happening here,

what does the game offer- the game is offering , a very simple motion or activity, which is easy to do. and the user is interested. if it is just a play button and automatically toio walks, the user might gwet joy but not for long time. here in very step he has a small interaction and involvement, which actually gives him the joy of doing the work correctly. when he finishes one task, his mind automatically looks for the next task. in such a way the complexity increases. so

1. the game triggers the kid with the simple Action or motions demo , and invites to explore.

2. the kid starts his action which is simple less effort, but the involvment is crucial to the total result.

3. the accomplishment of the task, sometimes may be failure can occur.

4.During using the guidebook the next actions captures the mind and creats the next trigger or the motivation for the next action.

NIr Eyals book of HOOKED-A Guide to Habit forming Product actually talked about the pattern of it , with more details. In all the social media apps, Games  or Sites of mail actually follows the pattern .

The  First three phases of  Hook model is very similar to chess Model.

The trigger is the Attractive piece  or a important  square offered to the opponent which is not guarded or not defended, completely hanging, Now the users minds look for what he needs to do to take that piece.

if its a free piece, and can be easily captured,  opponent moves its  piece and takes it. the level of simplicity drives the  action.

the advantage -The opponent might Get some material advantage or may be there is a possibility to find Double attack or Fork In the next move. The probability of getting a move or the material advantage drives the opposition to bring its pices  to the trap.

the next move is a investment step to capture the piece which came to the trap.

**The Hook Model**
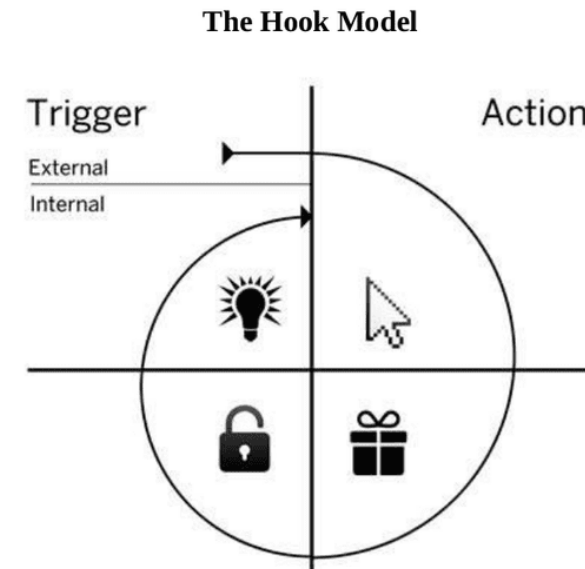


Trigger in Design- there can be alot of things that can be considered as the trigger for the user.  A kind of type of smell, a small click sound, a small sense of doing something good for society or nature, The motivation to get all these afore mentioned thing can be considered as trigger. But the important thing is to accomplish the action or activity what the user need to do.

the things user needs to do depends upon lot of things, one obiviously the trigger, while to to accomplish the action the capability of the user is important .

How difficult is the task to do, if it is very tough to do mostly people will avoid it. So for iniciation at least the task should be very small. After accomplishment of the action there comes a return. It is called as reward. the reward may not be always tangible. it can many ways Charming to the user. the Designer needs to find out what type reward attracts the user most.

After getting the reward user should not be leave alone. the next investment should come from the designer side to make the user  confined to zone where he goes for the next trigger and come into the perpetual loop of habit of using that product.
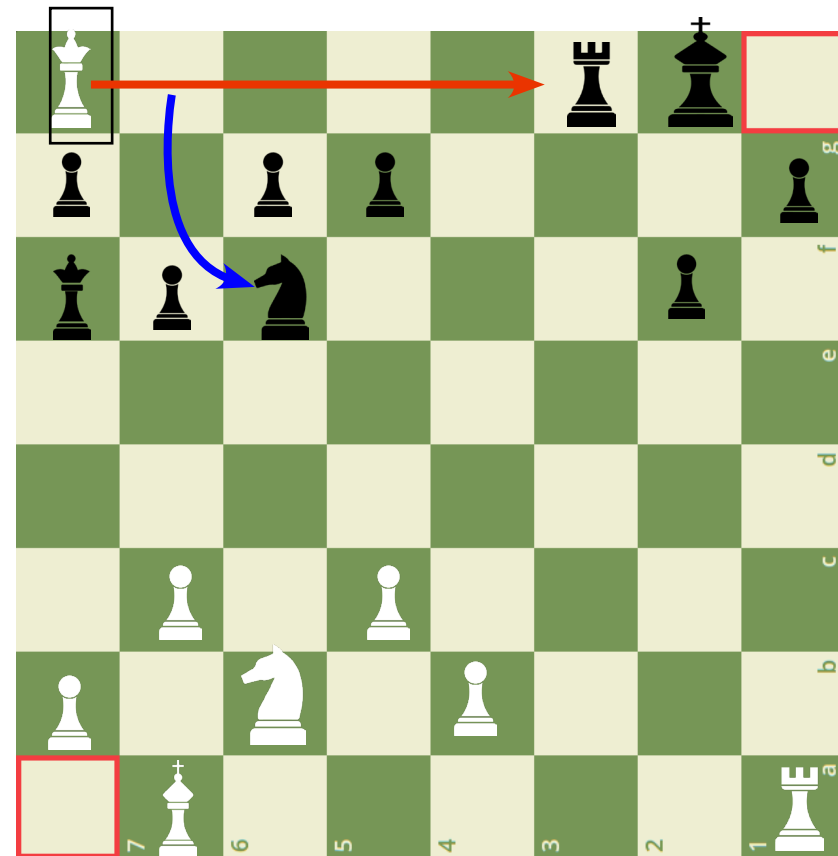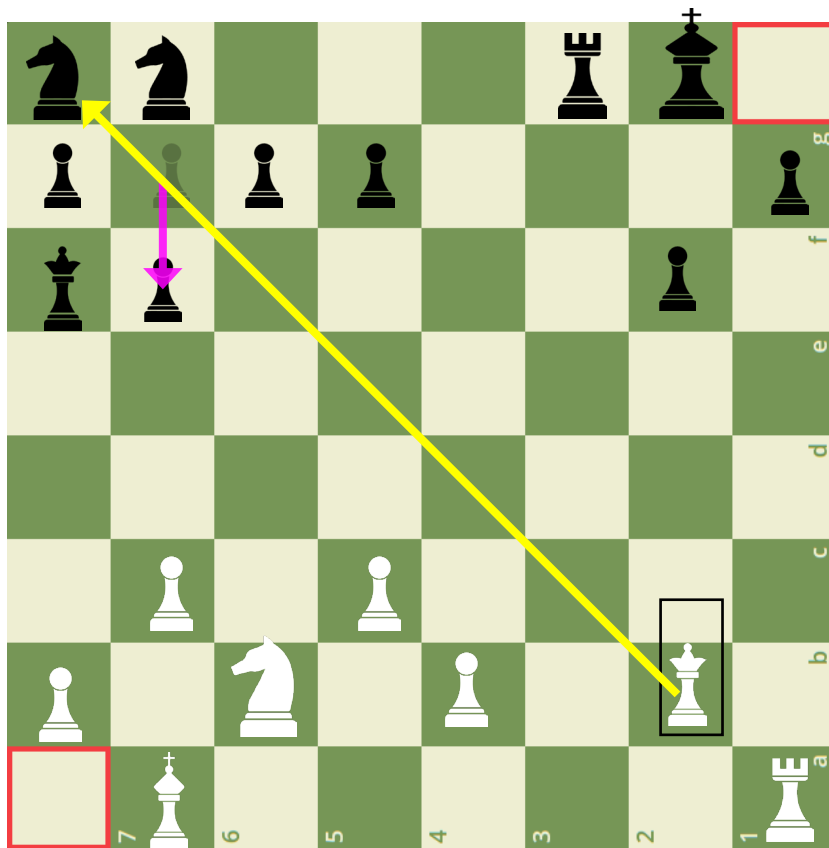
Violet line is the trigger or the invitation to the White queen to have the knight. the knight is apparently a hanging piece can be taken by the queen easily.

Yellow line is the action by the opponent to take the knight. there is no harm and consequently the reward comes to white as a material gain.

The blue line is the investment where it blocks all the way of Queen to go back, and it's doomed to be killed.

the maximum or the material gains is the capture of rook red line. So, it goes to capture the rook and king captures the free queen.

**Card 6- Under Cover-**This a very interesting tactics which can build an emotional connection to user, most likely who are not yet much attached to the product.

Discovered Check-Discovered check is a special variation of Discovered atteck, In dis covered attack one piece moves away , and by its displacement another piece gets an open file , in that open file opponent piece gets attacked . this is called Discovered attack.
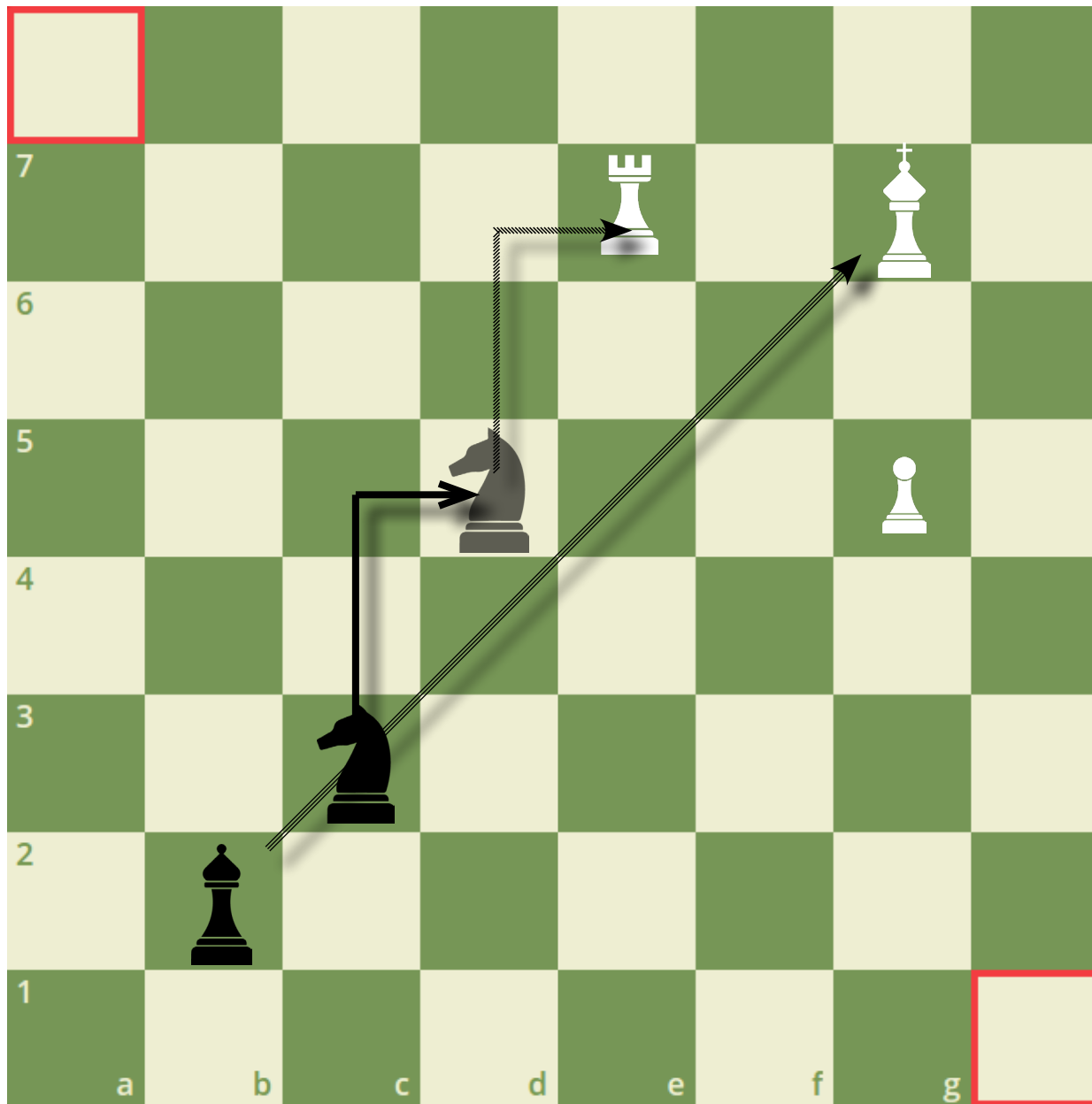


**DISCOVERED CHECK**

In discovered check there are two pieces attacking the the parts one at the present move another piece which is a subtle attacker behind the active piece gets his channel open and on this open path their is the oppponents kings so it directly gets a check. and in order to save the king it needs to changed, and the other piece which is attacked by the active piece gets captured.

**HOW TO USE .**

1. Where to use, this card? Some product are in use but particular user does not use, so target audienced to be choose.
2. Particular timing and particular space needs to be counted. Example pisa glass/ moonlight bulb.
3. The product needs to be connect with a expirence which is popular and right now not in practice with the same product.
4. Make the product related to that experi-ence or bring the memory of that product.
5. Technology can undermined or can be compromized to make it releavent with the design language of the product.

The concept of Designing With a meaning is not something very old. Dr. Roberto Verganti introduced coined the term Design Driven Innovation and said how the design driven innovation can create a new meaning. Design of a product can change the meaning the of the product. Previously to match the technological growth the products designs are get improved. Or to solve a new problem, a new product could emerge. But now a days ideas have over flowed. So in this world the products to attract the customer only problem solving is not enough.

What does this design driven innovation do?

Design driven innovation creates a new meaning of the product. if a product solves a problem but it can say about something completely different from its design language. From its shape, color, texture or even smell it can totally create a different identity. Dr Verganti gave example of Yankee Candles, these candles are not sold for lights. The candles are Perfumed Such a way that when It lights up, it emits the fragrance. So here the candle traditionally main function of giving light is not that important, but the other attractive feature of beautiful smell makes it attractive.

I have found multiple examples of these concept in the successfully designed product which came to if Design Award. The look or the feeling of the products creates a completely different identity. the surprise element of the product is most attractive feature while it has a sense of beaty what no doubt worth of praising is.

Rain Tunes, which was developed by HansGrohe in collaboration with experts from various fields, offers an inspiring shower experience. It synchronizes the temperature and intensity of the water, controls light, scent, music and other multimedia applications. In combination with the "Hansgrohe Home" app, this shower system turns your bathroom into a smart and multi-sensory environment. The mobile RainButton allows the user to fully control operation without using the mixer. This represents a truly novel approach to bathroom design, combining technology and digitization with esthetics.



This design isnot only about the enhancement of the quality of shower. this changes  the experience and make it something  which is much more mood freshening.  its  almost an experiencing natures tough through the shower experience with the help of technology.

Mostly I feel the designers most important  task here to identify what is experience we can present through our product. and connecting that experience with design language of the product. For example Here digitalization transcends the user to nature as if teleportation is possible. it can be completely opposite also A vintahge look of the product can take you back in time or a consumer electronic can  be represented as a furniture.

One of most important technique what can significantly add value to design is this technique.

# Undercover-

This Card ids Used to create a different meaning or identity of the product.



## Benefit
1. Surprise Addition
2. Nostalgic connection
3. Addition of New customer segment

## HOW TO USE .

1. Where to use, this card? Some product are in use but particular user does not use, so target audienced to be choose.
2. Particular timing and particular space needs to be counted. Example pisa glass/ moonlight bulb.
3. The product needs to be connect with a expirence which is popular and right now not in practice with the same product.
4. Make the product related to that experience or bring the memory of that product.
5. Technology can undermined or can be compromized to make it releavent with the design language of the product.

# Example-



Ceramic fridge
BSH Hausgeräte GmbH
This refrigerator has a monolithic appearance, interrupted only by a narrow stainless steel strip. Inspired by modern architecture, its most characteristic feature is its true-to-nature ceramic applications. The slender shape blends perfectly into contemporary kitchens. Thanks to the use of hygienic materials, the vibrantly textured, silky-matt surface is very easy to clean. Combined with the trendsetting hyperFresh Plus freshness technology for prolonged shelf life, the appliance offers an excellent user experience. Also optionally available in a white marble look.

GEOMETRY
Gaming console
Shenzhen alpha design Co., Ltd.
This handheld console breaks everyone's understanding of traditional game consoles. It combines modern and retro styles in one controller. The minimalist form is not lacking in design sense, which recalls the classic Braun design style. The design is to evoke childhood memories and convey a comforting yet exciting combination of human care and modern technology.

**Card 7- Compactor**-this card is not based from any tactic. This is a very useful rule of move in chess. but this one is a critical strategic move
Castling-
Castling is a move in the game of chess in which the player moves the king two squares toward one of the rooks on the same rank and moves the rook to the square that the king crossed.[2] It is the only move in chess in which a player moves two pieces in the same move.
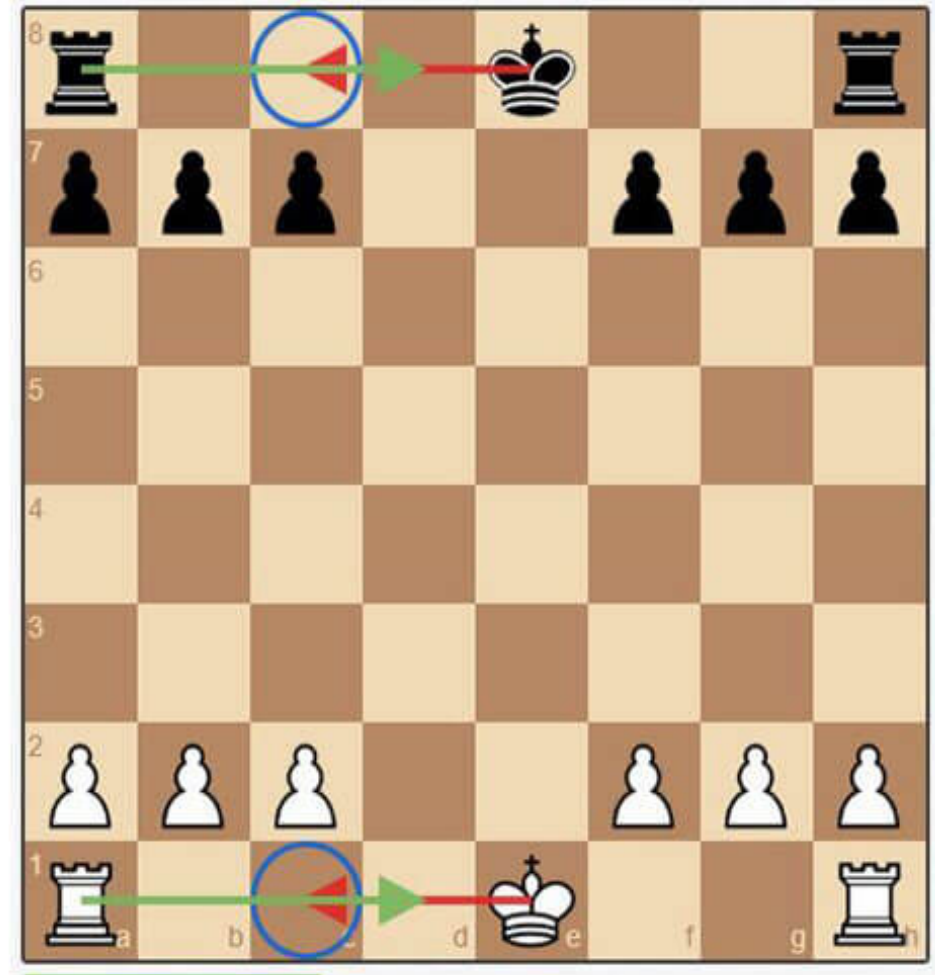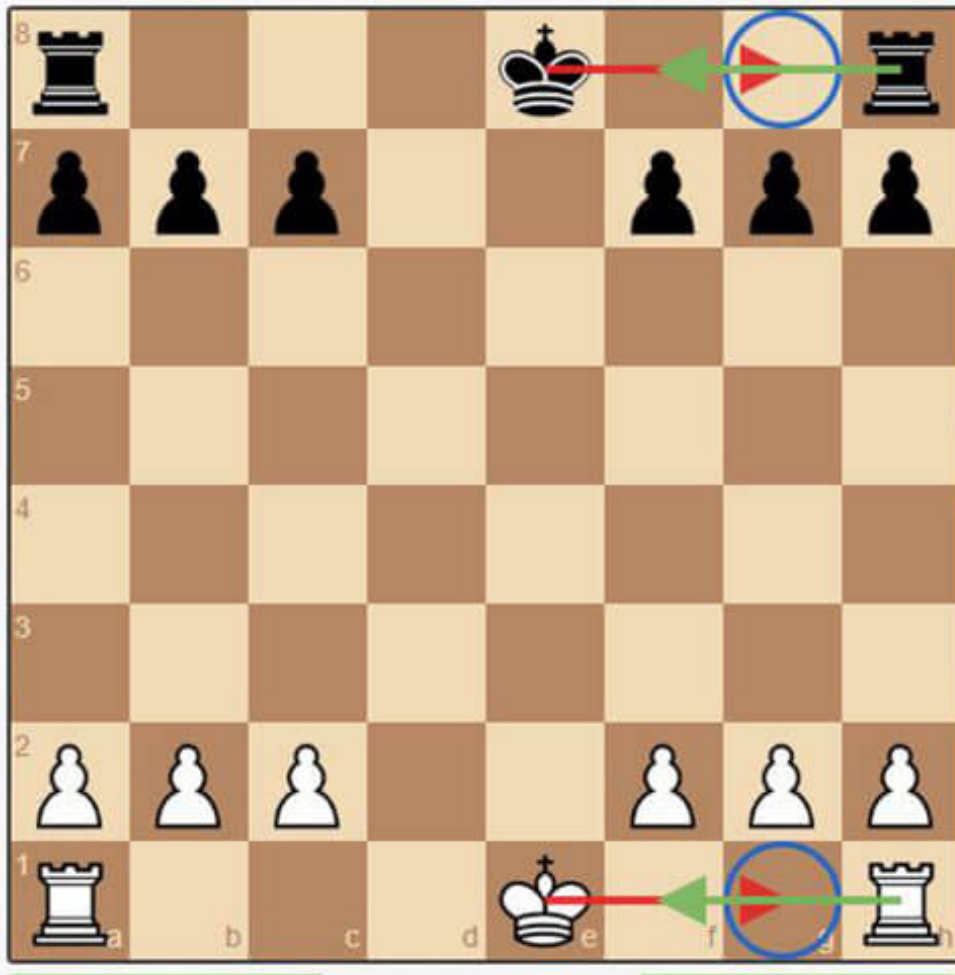
# COMPACTOR-
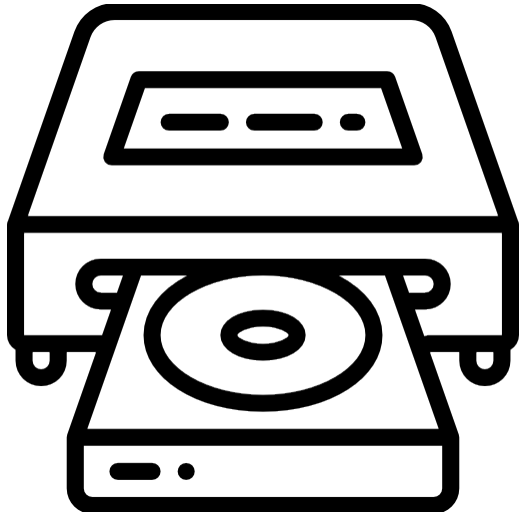


## BENEFIT-

1. Integrated Aesthetics
2. Less Space
3. Healthy lifestyle
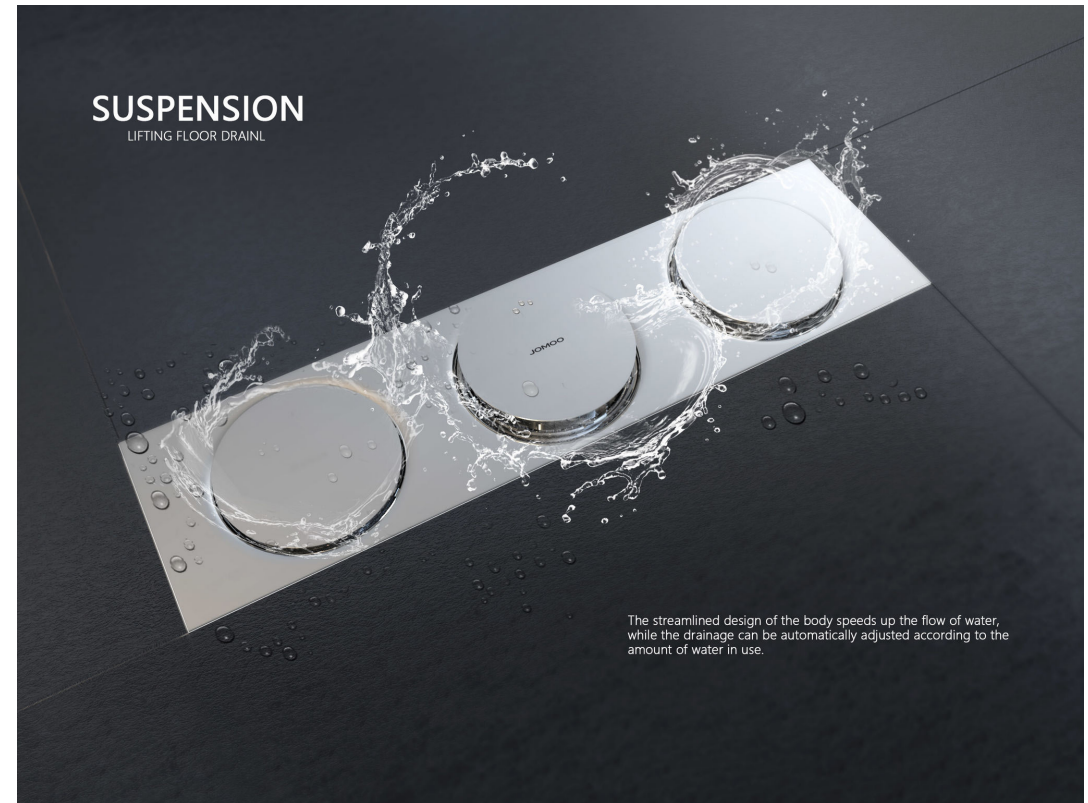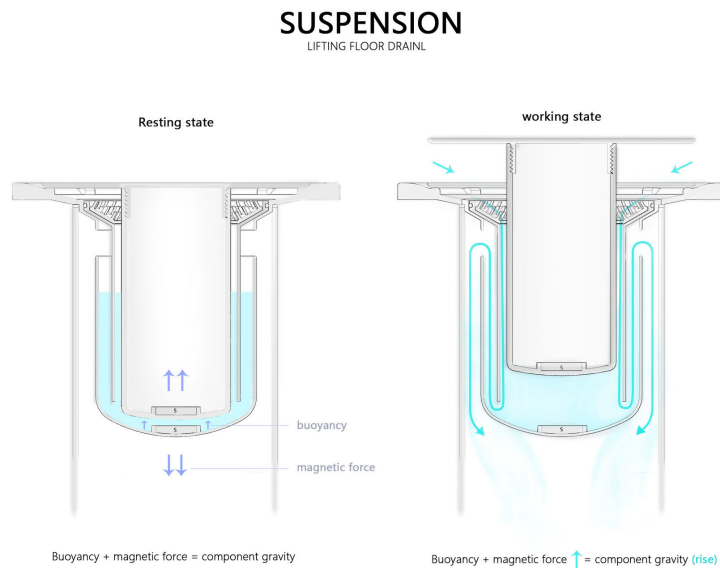4. Super attractive outcome.

## How to use this card-

1. Look for the Operations can be hidden.
2. Use intutive very subtle signifier to the affordance.
3. Use the shape more to generate a language
4. Check the overall integratity of the product
5. Remove all ambiguity

# Example-



The Horizon sideboard was inspired by rectilinear motion, a rhythmic act. The piece portrays the strength gained from a set of repetitions transformed into a single homogenous block. The rectilinear motion, alongside the trianglular form, allows the drawers to be opened through subtle cuts in the wood, hidden from the eye, that call for intuitive human movement. To accommodate multiple settings, the sideboard was designed and is manufactured to be suspended from the wall or with legs for support.

Suspension is a magical floating drain. Its streamlined design accelerates water drainage, which is automatically adjusted depending on the amount of water used. The automatic lifting mechanism facilitates cleaning and maintenance. The Suspension drain is based on the principles of magnetic levitation and features a U-shaped connector. The design is ingenious in that the repulsion between equal magnetic poles and the buoyancy of the floating ball lifts the cover of the drain to increase water drainage; once the water has drained completely, the cover automatically descends.



## SUSPENSION
LIFTING FLOOR DRAINL

Resting state

working state

buoyancy

magnetic force

Buoyancy + magnetic force = component gravity

Buoyancy + magnetic force ↑ = component gravity (rise)



## SUSPENSION
LIFTING FLOOR DRAINL

The streamlined design of the body speeds up the flow of water, while the drainage can be automatically adjusted according to the amount of water in use.

This gives a very clean look but the aesthtics is developed with the base of technology. Without the technology this type of design is very difficult. The compact form and inclusive design of this products attracts sophisticated customers a lot.

**Card 8- Re-collector**-this card is more towards the material or process selection of the product.this tactics ensures a benefit to the society from the perspective of greater good.
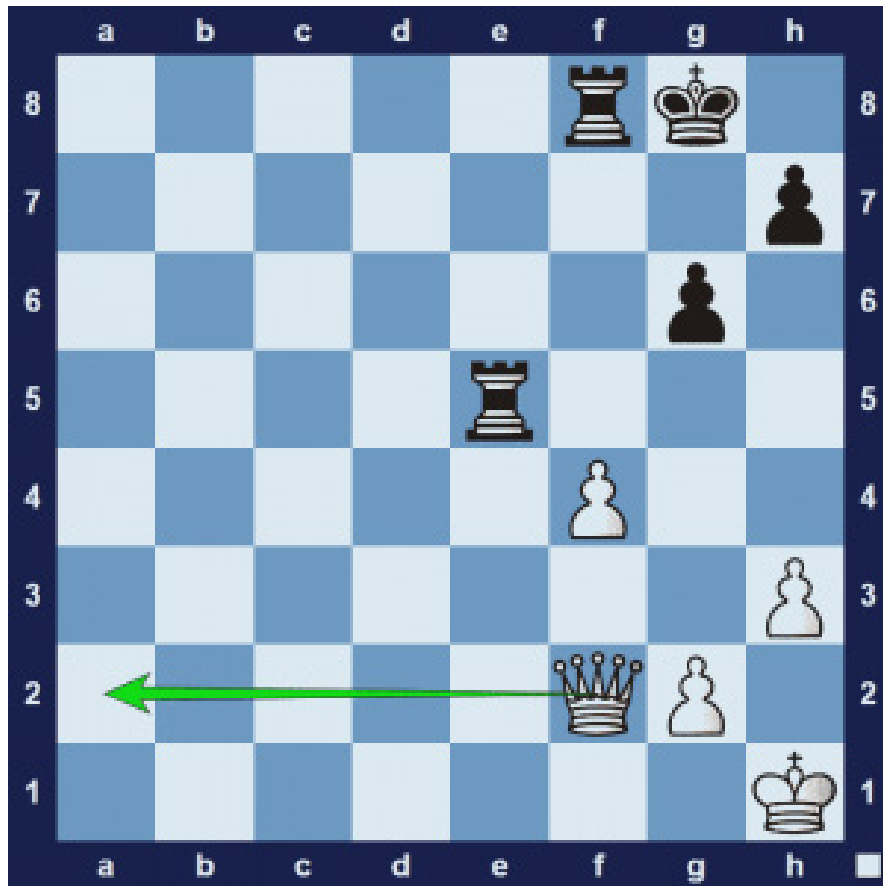


The zwischenzug ("intermediate move") is a chess tactic in which a player, instead of playing the expected move (commonly a recapture), first interposes another move posing an immediate threat that the opponent must answer, and only then plays the expected move. It is a move that has a high degree of "initiative". Ideally, the zwischenzug changes the situation to the player's advantage, such as by gaining material or avoiding what would otherwise be a strong continuation for the opponent.

In case of design- Any thing which is considered as threat can be consumed as a resource. it can develope a huge benefit.

May the product can use waste heat for some purpose or it can take some waste material as one of the ingrident of manufacturing.

# Re-collector - Recycling material, or using excess or byproducts of any other industry, or aprocess to make a new product.

## Benefits-

1. Reduces cost
2. Sustainable
3. Attractive to customer
4. Surprise element
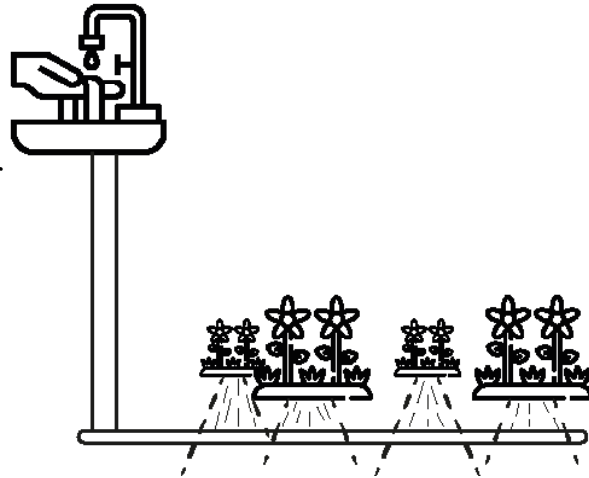
## How to use this card-

1. Look for the main ingredients of the product and also its operation.
2. It may be the material, Time or effort if that can be a by product, waste or excess of any other operation.
3. two operations ( from which the material coming and where it is going to be used) should not be affected.
4. check the reuse process, availability and demand are coherent or not.
5. All other factor which is changed due to the reuse of material should be taken care of.
6. Make the changes clearly understandable to the user, seller and other relevant stakeholders

# Example-
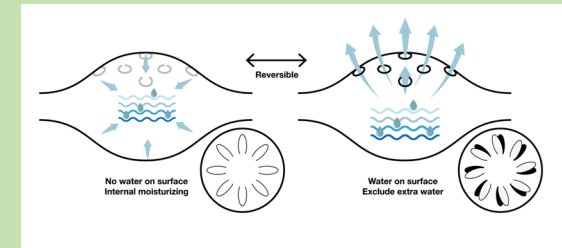


Fiber Soil-
Fiber Soil is a planting base made from the inseparable materials in recycling clothing, a mixture of cotton and polyester. Thanks to its soft texture and modular skeleton, it can be easily assembled to create large-scale green walls and floors, whether flat or curved. It also incorporates technology for automatically regulating water retention. This is a brilliant green solution that combines the ecological precepts of recycling and reuse to create something new and truly beautiful.

## 10. What is the Peer Review?

I organized an online workshop and explained how to use the cards and gave a set of 3 examples to use them. after the 45 min explanation and discussion I sent a Questainer which is basically as follows-

## 10.1 The Questions-
1.Are you an Engineer or a Designer
Designer
Engineer

2.Do you know the rules of Chess?
Yes
No

3.Select of the examples given to you , and analyse them with cards. (Answer can be multiple)
Option 1
Option 2
Option 3

4.According to you what can be the cards used on the example you choose? (can be multiple cards)
Enter your answer

6.How much time it took to use the card?
Enter your answer

7.Suggestion to improve the cards.
Enter your answer

8.Do you want to use these type of card for your design?
Enter your answer

**Example 1.**
**Chopping board set**

**Stacking Shadow**

This chopping board set is a kitchen helper. The three boards have different functions: the first is designed with a groove to gather the dregs of cooked food; the outer circumference of the second cutting board is raised to prevent the juice of fruits and vegetables from overflowing; and the third cutting board is for fish and meat, with an anti-slip particle strip in the center to increase the resistance of the ingredients and the cutting board.
 https://ifdesign.com/en/winner-ranking/project/stacking-shadow/282798
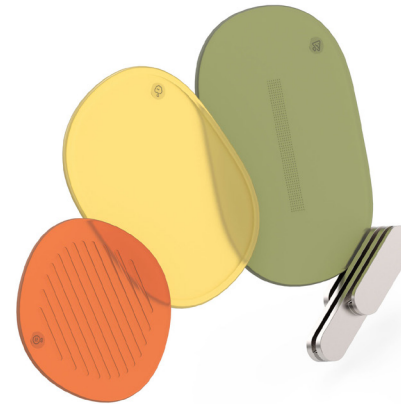
**Example- 2**
**3m SecureFit helmet-**
**Safety Helmet**

The 3M SecureFit™ safety helmet is designed for use in construction, oil, gas, utilities, forestry and manufacturing. It can be tailored to multiple different applications and used with a range of hearing, eye and face protection products. Ergonomics show in its light weight, improved protection, and a shorter brim for better visibility. It provides excellent ventilation, fit and stability due to an innovative suspension system. The form language is inspired by sports. The geometry consists of a rigid reassuring structure, signaling safety. Minimal material use and easily separable parts make recycling easy.

https://ifdesign.com/en/winner-ranking/project/3m-securefit-helmet/282628

**Example-3**
**DED-60TX**
Music box and percussion board

DED-60TXis the first musical instrument in the world to combine a Bluetooth speaker and music-making functions. The device is not only a music player but also a music editor, combining a percussion board, two 10W stereo speakers, two drum sticks, and a bass drum. The device is very portable and easy to use indoors or outside with a soft-edged triangle-shaped body that gives it great stability.

https://ifdesign.com/en/winner-ranking/project/ded60tx/301601

## 10.2 Suggestions

T Time taken by everyone is is very less like - 5 mins approximately.
6 of the designers did the work on spot, other 4 gave the response over the spread sheet.
Mostly they choose the example 3, though it was done completely separately, but I surprisingly found most of them choose the example 3.
this example uses 3 type of tactics- Undercover, All-Rounder and Compactor.
Percentage of identification is 66.6% correct.  All of them identified at least 2 of the 3 cards.

Important Remarks as Suggestion I got
1.I like that all the cards are structurally the same and have an example, however, I think they could be more concise, especially in the bottom left section. The information should be presented in a clearer way. I probably understood them with more ease because they were explained to me in the zoom call. The concept of each card is simple enough, but the communication still needs more work... I would suggest talking to a graphic designer (maybe from the communication course) to get tips on how to improve the readability of the cards. Another suggestion might be to look at actual playing cards: for example, top trump cards have a very coherent communication and allow players to understand the "power" of each card with very little information/symbols.
2. As mentioned over call, making "CARDS" more related to chess can give the designer more assurance on the methodology
3. Make card more intuitive to use and quicker to understand in once glance.
4. It would be very helpful if the cards are used in a step basis to solve a problem of a product. Also if the chess strategy was visible in the cards it would have been much more appealing and would make the concepts more unique. Another point is to combine with startups and ask them to try use the cards for the product development.


In short
The Cards are easily understandable to all the Peers in the meeting.
Very first time it is used within 5 mins.
correct identification of the cards.
The cards are good to use for most of the cases, and from the suggestion of using it to some specific case where the journey is known I did an One objective but different path study. Which I am describing in the next page.

## 10.3 One objevtive different path  study

According to the 1st review from my seminar, organized on 5th February, I basically got some great ideas.  Mostly people are very much interested to see these cards on some projects which are in the process. I got a good idea like it can be implemented on some of the Startup projects which are not completely developed. And to see the differences it can create in the journey of the product.

the second suggestion was the cards can be much more intuitive, the cards need much more graphical upgradation.

some people are saying that it can be shown that it is derive from chess, to make people more attracted on the matter that these cards are derived from a very reliable old game theory.

the time it was taking to review a relation to a project was very less. after understanding the cards, it is not more than 5 mins.

So basically, it is very simple and easy tool to understand.

Based on the 1st review design engineers are giving their remarks that it can be a useful tool for the newcomers to design.  or a simple guidance to the people who don't have much idea in design.

Remarks-

In discussion with my peers, I really liked the idea of using the cards in the process of some projects which are right now on going. or the buildup process or the journey of product is much more known to us.

the suggestion given to me was actually trying to apply this technique on some of the Startups who are going into PoliHub, the startup incubator cell of Polimi.

But due to lack of it is very difficult to implement on different live projects.

Instead of this I proposed to revisit any of our project where one main goal was to design the same product but to design it by different methods and for different audience. I took the example of our 1st year 1st semester project of making Plastic trash compactor.

I readily got the examples from my peers, and I did the analysis with them to see is the vision inclined the cards with the actual philosophy that time we followed.

I got access to 6 of the projects from the Studio1, among them 4 of the projects are uniquely aligned with the card. so I decided to discuss only four of them.

## 10.3.1Example 1

**Plastic Trash Compactor For Starbucks**- This has been designed as a Furniture for Starbucks coffee shop . It is not identified as a plastic colleting trash. it more looks like a beautiful furniture integrated with the interior of the Starbucks coffee shop.

So I have easily identified as a Undercover Design example.

As a Description of the product it is written that

"Our aim was to design a trash compactor specifically for plastic section of Starbucks Coffee Company, with research and prototyping we were able to come to this solution.

This was a great experience for me since we focused on materials and manufacturing in depth and were able to solve a part of environmental issue. "

# Undercover-

This Card ids Used to create a different meaning or identity of the product.



## Benefit

1. Surprise Addition
2. Nostalgic connection
3. Addition of New customer segment

## HOW TO USE .

1. Where to use, this card? Some product are in use but particular user does not use, so target audienced to be choose.
2. Particular timing and particular space needs to be counted. Example pisa glass/ moonlight bulb.
3. The product needs to be connect with a expirence which is popular and right now not in practice with the same product.
4. Make the product related to that experience or bring the memory of that product.
5. Technology can undermined or can be compromized to make it releavent with the design language of the product.



- Target Audience-STARBUCKS COFFEE SHOP
- Color Combinationand the feel- Relation to coffee
- Technology is not that costly or main from Business Point of view, the prime factor.
- Instead of trash can it gives more vibe or feel of a small furniture.
- product language is aligned with a coffe shop interior decor

## 10.3.2 Example -2

**Sily-** The plastic trash compactor which is made up with the top part with Silicon. So here the smart use of the material actually helps to solve the problem of any mechanism required for the trash compactor. the top pat is actually used as both the thing the cover or the shell, as well as the compactor mechanism.
So i trhink it is a good example of  Double attack tactics and  the CARD used is the All-Rounder.
According to the designers of this product- " we wanted to design an easy to use product, with a quick and intuitive compresssion System.
We also had the desire to create a playful product to foster all generation to compact their trash.
From the analysis , we came with the idea of having a flexible top part linked to a rigid bottom . The soft top part will deformed to compress trashes in an entertaining way."
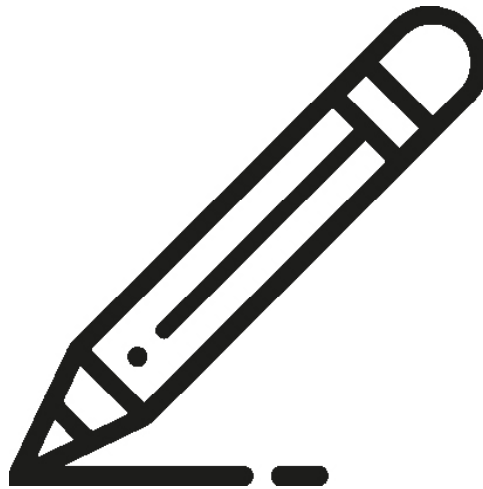
# All -Rounder

This card is used to add more functionality to the product or it's components more coherently, to make it more versatile.

## Benefits

1. Space reduction / less carbon footprint
2. Cost effectiveness
3. Ease of operation.
4. Less Time requiremen to do the problem
5. Make a co relation of the components or functions.



# How to Use this Technique

1. Main objective of the product
2. List down tyhe functions desired to be multi tasked.(According to occurance, timing, field of use) for example- if its kitchen product what can be the similar operations at that time in kitchen. if its a knife , what are the other operation can be done with a metal blade. during cutting and cooking what are  other things need.
3.Check the occurance, co-relation, and signifance for the closes operation
4. Check the features needed to add in the product
5. Put recognigable signifier or affordance
6. Check the time of retract
7. Similar experience or easier experience or not.

- The component of the outer mainly used as cover
- What are the other thing it can do- Carry the wastes, compress the waste when required.
- Weekly twice or thrice is the frequency of use  for compression
- Handle is given to signify that it can be  compressable, also the material change of the top half and bottom half give an indication.
- after compression it goes back to its original shape automatically.

## 10.3.2 Example -3

**Tryca**- this product gives a small aperture to throw the bottles into the trash. this has an option of throwing trash and compress but due to the small aperture the user mostly compacts it manually. Because for a big waste you can open the whole top cover but the much easier is to open through the small side aperture.

this actually leads to an habit of the user to crush the waste before throwuing it always. This is good example of Habit Builder Example of cards.
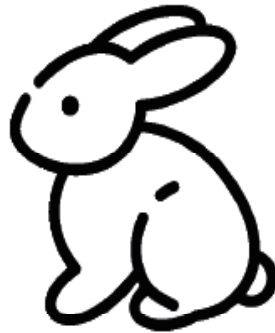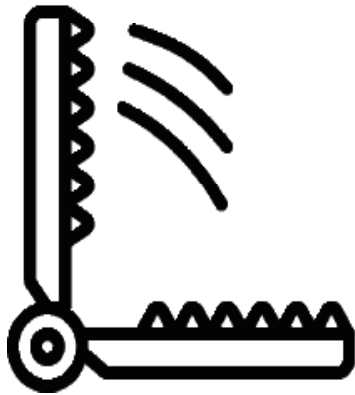
# Habit Builder- this card is to make a healthy  habits or practice by challenging the user with lucrative tasks or features.

Tryca as a habit builder

## BENEFIT-

1. Creates loyal customer
2. Iconic experience
3. Healthy lifestyle
4. Super attractive outcome.



## How to use this card?

1. when the product is going to build up a habit or a lifestyle practice this is a useful practice,

2 Easy and small tasks to challenge the users mind .

3. Easy to practice the habit and gives a good amount of satisfaction . encourage to use it more.

4.With the time the process becomes more enjoyable and use becomes addictive

5. mostly technology driven and outcomes are variable and gives an esssence of reward.

- Practice of good habit of compressing the plastic object before throwing.
- the Side black strap helps to make "the throwing the waste through the small cut", than "opening up the total top lead".
- this process of compressing can be a part of habit while the person is not restricted to a small cut, but unconsciously he will do it.

## 10.3.4 Example -4

ZARZAR- the trash compactor does not need a extra plastic  bag to throw the garbage, the inner Shell actually  a dettachable part from the white outer shell. So the user can take the black portion and throw it in the garbage. the storyboard shows how it is possible .

Using one extra plastic bag  for  one family can reduce a huge no of of plastic. on an average just to throw plastic waste we need 138 more plastic bags.
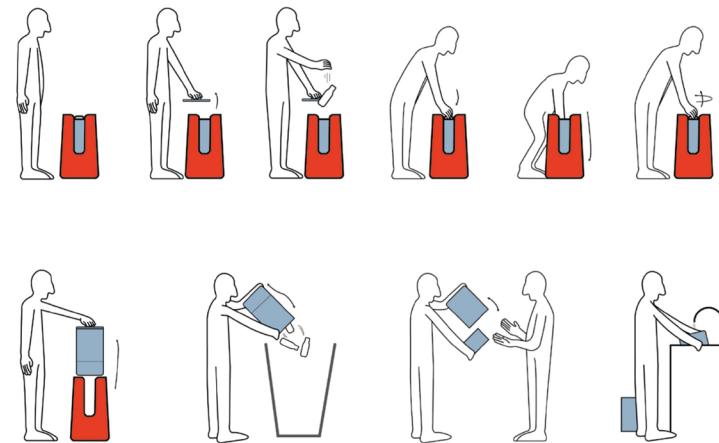
So with this design we eliminate  a plastic object from the process. So it is an example of Elemination of defender Example.
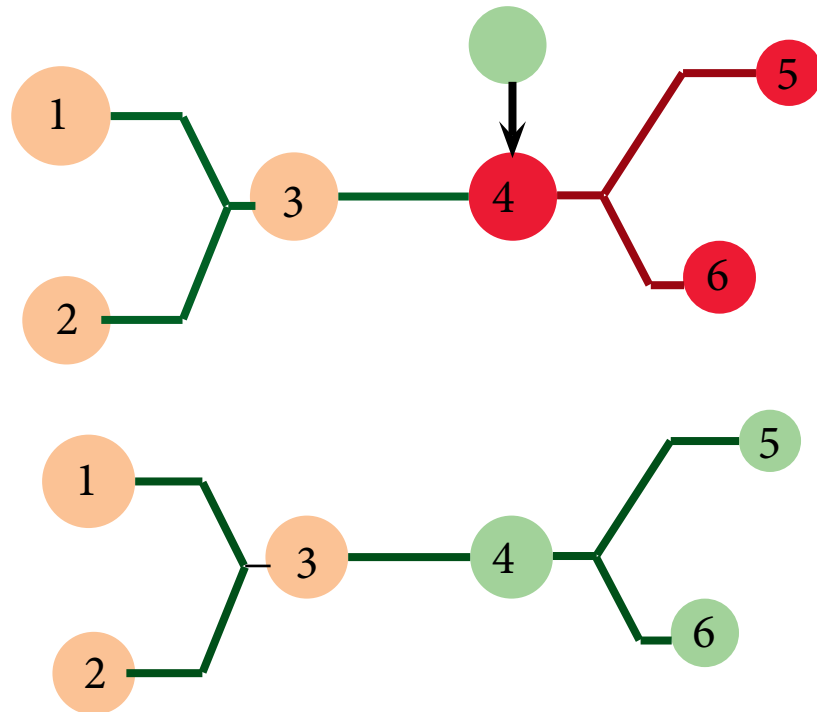
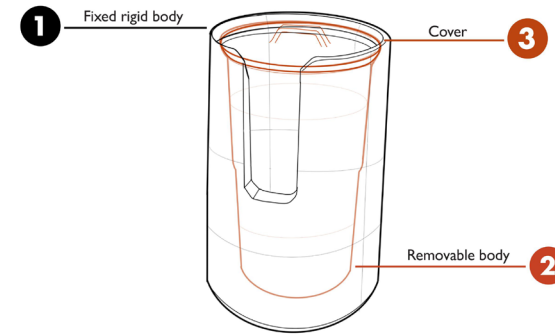1/3 Reduction in total uncompressed volume

Compression

Mode of use

ELEMINATION OF THE DEFENDER-this card is basically used tr problem solving approach by eliminating , a particular process, a particular object .





Concept

- If it product is for reducing plastic garbages in the world,
- It should not attach any process to increase plasticwaste.
- the process of throwing the plastic needs another bag.
- Eliminate this plastic carry bag by giving the facility to take the waste with the bin itself

HOW TO USE THIS CARD:

1. try to find out the main issue to be eleminated.
2. how it is connected to the product, it uses or its manufacturing.
3. check all the connection behind the trouble,
4. deep dive in to it asking for reason(5y method)
5. Hit the original source of the problem by your design
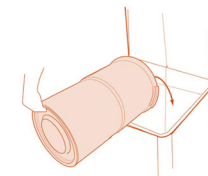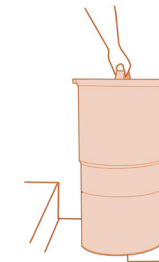


Extraction

## 11. What is the conclusion?

### 11.1 Conclusion

The cards Derived from chess Tactics are mostly able to explain the the design stagies used for the examples taken from IF Design Award winning designs with 87.5% of success rate.  So I guess in the Product design field it  can be a very useful tool to brainstorm new ideas and to find out a particular direction of design.

AS it is very quick to use, the newcomers who just entered the design field can be benefited a lot. the tool is mostly dedicated to product design so product designers can use this cards  to evalute and upgrade a design.

In a rush moment where a quick decision making a needed it can be used to evalute ideas and check the versatility of creativity.

### 11.2 Next step-

- I think there there are lot of possibilities to work on this cards, because I just initiated the process and this type of initiative is completely innovative.
- During the explanation and comparision I found some very nice concepts what are all ready availble and widely appraised are often aligned with the Chess tactics based design Card Stagies. So I hope there are lot of exposure to findout new connections.
- The cards can be up graded a lot from the aesthetics and also from information perspective.
- Chess tactics are often amalgamated with each other. So, I believe there are more exposure to find out new tricks and use them in design.
- Designers can be interested in playing chess and evolve this cards more from the utilization point of view.

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