

Designing Work Organization

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Lecture 44

Design Thinking for Innovation-1

In this particular session on the Design Thinking for Innovations, we will understand what is the design thinking is there. In my previous session, I have talked about that is whenever we are talking about the innovation and one of the major element of this innovation is design thinking. So, here we will understand the origin of the design thinking and then how the design thinkers in the organization they contributes and what are the features, principle, benefits and the tools of the design thinking. Design thinking for the strategic innovations, types of the innovations, design thinking and the strategic innovation and as usual we will talking about the case study. In this session, we are having the two case studies, one is the Hewlett Packard and other is the Memorial Hospital is there and as usual research paper, book recommendations and the references are there. Now, the design thinking is not just the property of the designers, all the great inventors of the engineering science, literature, art, music and these businesses have used it.

So, earlier like it was the thought of that is it is only the technical designers are there, but it is not restricted to the technical designers rather than it has gone to the inventions of the in the literature and the music and the business also. So, design thinking supports is developing teaching, learning and the applying strategies to solve the complications in a creative manner in the projects and processes of the businesses are there. So, this definition of design thinking is a term used to denote set sets of the strategic, conceptual and practical processes. So, therefore, it is a long term basically, whenever we are talking about the design thinking, so there it is not a just for a fraction of second or a small duration rather than it is a strategic is there and whenever we use the word strategic it means that it is for the long term is there, then it is the conceptual is there and it is a thought process.

So, design thinking is making your concepts, developing your concepts, designing your concepts, which will be used for the practical processes will be there and it may be applicable to the product, it may be applicable to the proposals, structures, equipment, communication and etcetera. So, many key concepts in the aspects of the design thinking have been identified through studies across all different design fields. So, design concepts and design work in both the laboratory and the environmental context is there. Now, whenever we are talking about this design thinking we so, first the origin we will talk about and the concepts of the design thinking all the promoted by the developing the companies and design consultants ranging from a wide range of the fields including the software development, engineering, anthropology, psychology, art and business is there.

But, design ideas as they exist today have evolved collaboratively in the various fields and the industries are concerned.

Over 50 years and even more have emerged and merged into the quasi drawing system of the natural selection and these have been the integrated, documented and the promoted by the leading design firms such as the IDEO and the Frog and the educational institutions such as the Stanford is there. Now, here when we are talking about the ancient literature of the India, then we find that is a design thinking is a 1000 years old. I would like to take you must have heard about the sculptures of these Mahabharat and the Ramayana is there and so, in the both the cases when we are talking about the winning over the war and therefore, the ideas which have been generated whether it is by the Lord Rama or the Lord Krishna. So, in both the cases we will find that is the design thinking, we already see and this is the ideas which have been later on in the current centuries also that has been taken through the books also. But whenever we are talking about the Indian ancient literature and then we find that is the it has been mentioned at the number of places when we are talking about the product process or the with the people even so, even the technology.

So, therefore, in that case like for in the Ramayana we talk about that is a Pushkar Vibhani is there or when we are talking about the arrows and the different types of arrows and their different impact is there. So, what all is this about the design thinking only and experimental design experiments, but when we are talking about these particular current time then definitely in the scientific way then these evolutionary and experimental design experiments have led to the methods process in the form of the design thinking tools and methods are there. In 1963, the idea of using design is a way of solving complex problem in a simplified manner in the science is originated in the book. The science of the artificial authorized by the Herbert A. Simon 1973.

The idea of design was achieved for the design engineering by the book experiences on the visual thinking authored by the Robert MacKin. And in 1982, the design methodology is defined by the cross and the study of the principles, practices and the procedures of the design are developed and included the study of how designers work and think. In 1997, Peter Rowes book so titled the design thinking describes the methods and approaches to dead planners, designers and the architects use. In 1980s to 1990s the work of the Robert McKin was consolidated by the Rolf faste at the stanford university during the period of 1991 and David McElhie founded IDEO and adopted the design thinking to the business interests are there. Now, in the 2009 the design thinking process itself is human centered offering methods for the inspiration, ideation and the learning designers are there, According to the Brown.

In 2012 apply the study of design thinking principles in the engineering. 2015 -the verbal protocol, analyst, cognitive, ethnography controlled laboratory experiments, and the other formal methods from the cognitive science have been rigorously applied in the engineering. In 2017, the design thinking referred in the many applications the prototyping, solutions based method is often useful way to the encourage inspiration, ideation and the organization learning and the human centered methods are there. Now, so therefore, here in this figure you find out that is in the from the 1960 to 2000s are there.

So, here there is a definitions then debated in 1970s, defined in 1980s, 1990s it is accelerated and in the 2000 it has been owned.

Now, so there here we can see that is the design thinking is the any individual who has the following traits can be design thinker in the organizations namely individual who has the concern for the individuals and who know the working challenges in a workplace. So, knowledge of the multifunctionality of the organization is there and vision for developing the right process in the organization, capability to understand the problem on the job and ability to work on the problems related to the job of the organization is there. So, therefore, here we can see that is the traits of the individual which is required to be an as a design thinker is there. So, here first and foremost, like we understand that is the future challenges maybe in the short term or maybe into the long term is there. So, whenever we are talking about the short term, so it is going from the 1 to 3 years and the long terms we are talking about 3 to 5 years and 5 years and more.

So, therefore, in that case the design thinker that he has to be able to visualize and that visualize and having the knowledge of multifunctionality of the organization. So, this is the vision of developing the right process in the organization and that is becoming a very, very important. This capability to understand the problem on the job and ability to work on the problems that he has to understand. Now, it may be in any nature of industry and when we are talking about a design thinking in the context of the workplace, then he should be, one should be able to understand that complexity, complexity of the challenge that is what type of the problems are there and how to solve this particular problem. These are the features of design thinking or the design thinking understands from the perspective of the customers and the provide solutions for improving the product and service quality in the organization.

Here, the role of the design thinking is to collect feedback from the customers and the employees by iteration of the prototyping is there. Expanding the range of solutions to the problems identified in the organization and the employee better customer and the employee satisfaction is there. So, enable the design thinkers to develop the new products or features or services to customer in the process satisfaction, providing an ecosystem through the interaction with the employees technical capabilities and the customers are there. So, here it is very necessary that whenever we are talking about one side the quality or the traits of the design thinker and then the other side when we are talking about that is the features which is required for the executing the design thinking then definitely in that case, we have to understand in the area where the design thinking is to be applied and therefore, we have to collect the feedback from the customers and not only from the external, it can be from the internal also. So, once you get that particular trigger or the sensitivity that is there is something is required to do to as a solution, then this will be expanding the range of solutions to the problems in the organization and the employees better customer and the employee satisfaction will be there.

These enable the design thinkers to develop the new products or features or services to customer and the process satisfaction is there. So, here an ecosystem is required to interaction with the employees and technical capabilities and the customers are there.

Design thinking is about how to think and act as it is about the process and the process is obviously important because whenever you want to take these steps, so, it will not be the one step activity rather than design thinking will be the multiple steps activity and when it is a multiple steps activity you are required to go further and there are the certain tested tools are there that need to be considered within the each mode and each with its own of the inputs outputs and the well defined functions are there. Aside from the processes, the design thinking is also about the thinking where the concept can be thought of as an integrated set of the beliefs and the attitudes are there. So, human focused design thinking, the process did understand from the perspective of the human including the employee and the customers are there.

So, we have to see the interface, interface between the technology and the people and in the organization whenever you are talking about the new product development, when you are talking about the solution to a problem, when you are talking about the application of artificial intelligence. So, therefore, in that case, in this all this process designing the process is to understand from the perspective of the human. So, therefore, the employees those who are the employees those who are the customers and therefore, what are their concern, their participation, their partnership. So, while doing to design these the thinker needs to consider the individuals beliefs, values and attitudes are concerned because unless and until if you suggest any design and which design is not acceptable to the human being or it is not possible to implement by a human being, then in that case, there is no possibility of that application of that particular design thinking. So, therefore, in that case, it is very important that is the human focused design thinking that you have to consider.

Whenever we are talking about the diversity to work in a team, so design thinking needs to consider individuals from the different background and train to work in a team. So, while group membership should be the balance throughout the project, it may be wise to occasionally include outside organization participants such as clients, suppliers, other topic professionals in the specific modes or the activities are there. The message is this that is you should not restrict yourself within the internal stakeholders rather than you have to also extend your thinking process, your application of any new idea with the clients and suppliers also. So, although detail comprehensive when we talk about the comprehensive way, so although the details are important, design experts are also able to identify and consider relationships are there. Now, here it is very important that the relationship between the design thinker, organization and environment.

Environment means internal and external environment, internal and external environment means it is the social economical aspects. So, therefore, this collaboration and communication between the seemingly different ideas are there. Whenever you are able to make this type of the design experts, those who are able to identify the relationships between the organization and customer, so and when and then they try to make their working togetherness that is a collaborations, then you will find that is your design thinking that is practically feasible and it can be implemented into the organization. So, flexibility and unconventional comfort is design thinking is best suited to deal with the problems and opportunities that describes in an incomprehensible way and requires the great flexibility in terms of the both content and the methodology. Example with the

required repetition of the modes and the categories are there and therefore, you ensure.

So, communication skills, willingness to communicate and work in a variety of ways including the speaking, visual, touch and so many. So, design experts design and build a prototype without the perceived lack of the skill or the competencies there. So, here the communication between the designer who is having this design thinking and which is applicable to the customers a proper communication is to be there. But why the organization should go for the design thinking they because there are certain benefits of the design thinking. The first one is it helps to overcome the creative challenges.

So, design thoughts gives you the freedom to look at the problems in many ways, it involves a lot of brains to come up with the best ideas which helps to improve the students knowledge. Therefore, in that case, it helps to meet the customer requirements effectively. Design thinking involves developing a prototype while testing and using the customer feedbacks repeatedly to ensure the quality assurance by following a successful design idea. So, your product will be eventually meet the needs of the customers are there, it helps to increase your knowledge of design thinking. So, you will do a lot of experiments in the design thinking processes and you will always try to innovate your model by using the customer feedback to ensure the customer satisfaction is there.

Now, what are the different tools of the design thinking are there? The first and foremost tool is that is the visualization. Visualization means any activity and that takes the information beyond the text as well as the numbers and the pictures, maps and the stories are there. So, they it is not well defined. So, that is the that the person has to imagine and here at its simplest level imagination is about the creating the virtual images, and images and the moving away from the our trust as masters in the number and text. So, at a deeper level, it is about the visualization, creating the mental images, clear representations of the our ideas and the details about the customers and information in a way that makes them the human and attractive.

Here, this visualization will be giving them the realistic approach and making the best ideas in their minds. So, therefore, they can be shared with these human artifacts. Here, the journey mapping is an ethnographic research mentioned that focuses on the tracking a journey of a client as he or she interacts with the organization while still working on the receiving a service. And with this, the special attention to the heightening of the reducing emotions, mapping experience is used to identify the needs the customers may be able to articulate. The third one is the value chain analysis is there.

So, whenever we talk about the value chain analysis examines how an organization works with the value chain partners to reproduce market and distributes the new offerings are there. So, as we always talk about that is the we have to contribute towards the value chain connect and the value chain is connect is the that is a value propositions. And your idea now which you are generating then implementing and creating and that should create a value proposition is there and when there is a proper value proposition, it will be the part of the value chain analysis. And these analysis provides ways to create a better value for the customers in the series and they reveals important clues about the skills and the goals

of the partners are there.

So, you are exploring basically. So, when you are going for this type of the value chain analysis, you explore the partners ideas and the skills also and you can also understand the goals of the partners. And the next one is the mind map. So, it is used to represent how ideas or the other objects are linked to the main idea and so on. So, mind maps are the used to produce the visuals, organize and clarify and it took a part of pattern and details that provides the important design conditions. So, through the rapid concept development where it is a tool to use these design details and terms, we have developed new business opportunities.

When people fear the world creative process, then the mental development may be the only thing that can think of and they often equate with the brain is there. The next tool for the design thinking is about the assumption testing. So, it is a tool for expressing the important assumptions that are less active to a new business idea and using the available data to assess the feasibility of these assumptions. This approach they acknowledge that may new businesses idea is actually an informed speculation about the what customers want and what they will appreciate. The prototype is the best test model for the proposed solution and used to test the validate idea design assumption and the other aspects of the consideration quickly and cheaply so that the designer or the participants can make the appropriate refinement or the possible changes along the way.

So, this prototype is actually giving you the real picture where the whether whatever the imagination was there that imaginations have come true or there has been the certain barriers are there. So, go creation is the based on the belief that the presence of the users is essential to be the creative processes users provide and understanding of what is important to them. At your core, this means that the concern is any process that bring the users and the designers together to work towards a shared goal is there. The next tool is about the learning launches is the study of the designer to explore the fundamental assumption of the total production potential for the new growth in the marketplace. It is contrast to the complete release of a new product and the learning implementation is a quick and inexpensive learning test to the collect the market driven data.

Storytelling in a logical way summarizing a story it is a close relative of the imagination one way to make the new ideas sound real and compelling the visual storytelling is a very compelling type of the story. Where they good presentations whether the analytical is a designate or the tells a fascinating story. So, design thinking strategic innovations that is having the innovation management. So, it is a concept which has multiple aspects and the dimensions and are contributed based on the multiple disciplines of the study that has a various theories and the framework is there. So, innovation management it is not restricted to one science or art or literature or one design or one the product rather than it is having the multiple disciplines are there.

Like I would like to mention about the types of innovations which are the four types. The first one is the disruptive as the sustainable in innovation radical versus in incremental. Third one is the innovation matrix and fourth one is the architecture and the modular

innovations are there. So, we will take the first one that is a disruptive versus the sustaining innovation. So, the concept of disruptive innovation is related to the concept product or service which will create new value to the existing market and they create a completely new market.

While the sustainable innovation is based concept of the improving and the growing the existing markets. Here in this diagram you will find that is when we are talking about the sustaining innovation. It is going through the problems is well understood existing market, then the innovation improves performance, lower cost, incremental changes, then the customer is believable, market is predictable and the traditional business methods are sufficient. So, this is going to be the sustaining innovation is there. While whenever we are talking about the disruptive innovation is there.

So, it will be replaying innovation, problem is not well understood, then the new market is there, then the innovations is dramatic and game challenging, customer does not know, market is unpredictable and the traditional business methods fail. So, therefore, in that case, in this disruptive innovations, we will find it is totally different. This radical versus incremental innovations happens when a new technology completely disrupts the existing business or economy and creates a new business model. So, incremental innovation in turn refers to a series of small gradually built improvements to existing products, processes or the methods to maintain the competitive positions over time. So, these radical innovations when we are talking about, then it is the explores the new technology has uncertainty, focus on these product, process, services with unprecedented performance features are there and creates a dramatic change, they transform existing markets or the industries or the create the new ideas are there.

While when we are talking about the incremental innovations, so, explores the existing technology, low uncertainty, focus on the cost and the feature improvement in existing processes, products or services, improves these competitiveness within the current markets or the industries are there. So, therefore, it can be the radical or the incremental is there. The third one is the innovation matrix. To clarify the aforementioned dimensions and to the better demonstrate them, we look at the four terms and the contributed them with the innovation matrix radically disruptive, then these innovations that happens in new technology and creates a new business model has no clear competitors radically sustaining improvement on a product or a process.

So, this is a sustaining innovation is there. So, this is how well is the dominant defined is there and how well is the problem is defined. So, if the problem is well defined and the domain is also well defined, then in that case, it will be the sustainable innovation will be there, which is nowadays everybody is looking for the sustainability. But when the problem is not well defined and these the domain is also not well defined. So, therefore, it requires the basic research is required to do in this particular domain. When the domain is well defined, but the problem is not well defined, it will be disruptive innovation is there.

So, but when these the domain is not well defined and the problem is well defined, then the breakthrough innovation is there. So, here improvements on these a product or

processes in the existing market that provides a new value for the customer incrementally disruptive and incremental improvement in technology that leads to a dramatic disruption. So, incrementally sustaining small and cumulative change in an existing product technology or the services are there. So, types of innovations will be the core concepts reinforce, overturn architecture systems and the radical innovation is there. So, architecture innovation is described as the reconfiguration of existing product technologies, modular innovation or the component innovation on the contrary, it is the exact opposite.

In modular innovations, one or the more components of a product is changed while the overall design stays the same. Here with the help of this diagram, I would like to mention, for example, the linkages between the core concepts and the components are there. So, radical innovations examples we have geodesic dome frame replacing conventional stick built lumber wall frame is there. While in the architectural systematic innovations, the example is the prefabricated wall frame which the HVAC is there, plumbing and electrical components replacing the conventional stick built lumber wall frame is there. While in case of the reinforced is there, so that that is about the unchanged and in incremental innovation.

So, lumber wall thrust frames replacing conventional stick built lumber wall frame. While when you are talking about the modular innovation that is the overturned is there, example is the extruded metal thrust frame replacing conventional stick built lumber wall frame is there. So, here in a model in all of these components is changed while the overall design stays the same. So, therefore, that might be the their designing thinking in the strategic innovation. So, it is based on the concept of the strategic management interaction between the design thinking and the strategic innovation provides the following benefits.

Concept of design thinking is supported in developing the products and services which match the expectations of the customers and thereby supporting the strategy of the organization. Design thinking provides an opportunity to integration of new ideas and the thinking which is essential for the development of right strategy for the organization is there. So, whenever we are talking about the design thinking and strategic innovation, so, these innovations come through the strategy and innovation jointly. So, it is giving you the this particular process and therefore, it is the value and organization norms of the international companies tend to vary depending on the organization's home country. So, organization norms and values are the influence by the values in the larger national culture is there and approaches in the ways managers coordinate and control on the international plan is there.

This is a case study of the Hewlett Packard which you can refer this case study that it is talking about that is how innovations have taken place in the organization and then you can find out that is the how increasingly share of both the consumers and the corporate computer is raised. This is the Memorial Hospital case study, this is giving with the healthcare industries and in the healthcare industries it becomes very important how do you take these innovations. Now, in design thinking for the innovation context, factors, process and outcomes, this is research paper by the Nicholas Rosch and Victor Tiberius, Sascha Kraus that is the that will be giving you an idea that is how design thinking for innovation that can affect the contextual factors, sources and the outcomes are there. This

study will also help you to understand that is how it is underlying principles and tools and the individuals as well as the organizational outcome of a design thinking concept is there. This is the value that action provided a holistic overview of the current state of research is there.

This is the another research paper that is enhancing the design thinking approaches for the innovation through gamification is there and this will be by these Rui Patricio, Antonio Carrizo-Moreira and Francesco Zurlo. And these help into understand how the innovations in the context of the early stages of the innovation process, design thinking and sustainability approach to the support innovative that is a complete and uncertain business environment is there. So, with this study of this book also design thinking for the innovation by the Walter Brenner and the Falk-Uebernickel, I am sure that you will be understand the concept in the different fields including the engineering, management, information technology, science as it offers the students and professionals a source book revealing the power of design thinking while providing the academics a roadmap for the future research is there. These are the references which you can refer for your further studies and you can find out that is the how design thinking that can be particularly possible to be implemented at the workplace. Thank you. Thank You.