

Design Thinking Methodology for Designing Product Displays Techniques in The Field of Industrial Design

Associ. Prof. Dr. Mohamed Mohamed Ryead

**Associate professor at Industrial Design Department - Faculty of Applied Arts - Helwan
University**

Delegate to Product Design Department- Faculty of Applied Arts – Badr University

mohamedryead@yahoo.com

Abstract:

The concept of design thinking appeared more than 70 years ago, and it is the result of an accumulation of academic research and actual practices with continuous development. It depends on a mixture of sciences, the most important of which are architecture, engineering, humanities, and business administration. Design thinking helps to identify and study existing problems, and then develop appropriate solutions to them. Therefore, design thinking is considered a methodology through which a path is drawn by following it, we reach the desired solutions to the existing problem, and therefore design thinking is an effective methodology in solving design problems through its contribution to the development of creative and innovative solutions that revolve around the user and achieve a deep understanding of his needs and desires. There are different models for the design thinking methodology in terms of its construction, the number of stages, the relationship between these stages, and the naming of each stage. However, most of these models follow a similar methodological path that includes the stages of finding problems that need to be solved, defining the problem and the scope of the design, creating the prototype, and designing the product, then the final feedback and feedback collection. Given the importance of the design thinking methodology in providing a basic understanding of what design is and how to do it? In addition to its contribution to finding a common language between designers and non-designers about what can be expected and what the process looks like, the researcher is looking at how to develop a design thinking methodology related to the design of product displays techniques for the benefit of industrial design designers when working in this field, especially in the Egyptian market.

Research problem: The research problem is the absence of a design thinking methodology that is specifically applied in the design of product displays techniques in the field of industrial design.

Research Objective :

- Develop a methodology for design thinking in the field of designing product displays techniques.
- Defining the role of the industrial designer in the field of designing product displays techniques.
- **Research hypothesis :** Develop a methodology for design thinking to design product displays techniques that leads to the development of innovative, creative design solutions centered around the user through a deep understanding of his needs and desires.

Research Methodology: descriptive analytical methodology

Keywords:

Design Thinking - Product Displays - Double Diamond Model "Innovation Framework"

Introduction:

As a result of analyzing the theoretical framework of design thinking, including definitions, foundations, and methodologies, and a review of product displays techniques through their types, foundations and design program, the researcher was able to reach the following results.

1- Developing Design Thinking Methodology for Designing Product Displays Techniques in The Field of Industrial Design.

The design thinking methodology developed by the researcher for product displays techniques in the field of industrial design is based on integrating the new model of the double diamond “innovation framework” with the stages of the product displays techniques design program and benefiting from determining the methods and tools used in the design methods, in addition to taking advantage of the design foundations for displaying the techniques. The design principles within the double diamond model shown in Figure (1), and the proposed methodology includes the following stages:

1-1- Discover: At this stage, an interview was conducted with the client and a discussion of the details required for the presentation unit, through which a concept and an overview of the company’s products were given and the importance of choosing the displays techniques and determining the optimal displays techniques to solve the problem at hand. The design method bank is used to choose the appropriate tool to discover the problem in addition to planning the time for managing the design project.

1-2- Define: At this stage, the results of the research problem were evaluated in preparation for its translation in the form of a document called the design brief or the design requirements that are required to be met in the display style by defining the space for the required display style, determining the brand to be displayed in the display unit and the artwork to be used, and determining the number of aspects used to display the products, in addition to specifying the colors and lighting used and the planogram for how to arrange the products on the shelves. The checklist can be used by answering the following questions to help formulate specific design requirements.

- What is the display method to be chosen (Floor stand, Isle stand, counter stand ...etc.)?
- What is the available display style space to be taken into consideration in the design?
- What is the required function of the display style?
- What is the time required to submit the display style?
- What are the types of lighting to be used?
- Are there specific elements that the light should be focused on?
- What are the basic colors to be used in designing the display style?
- Are there specific raw materials preferred to be used in production for the display style?

- What is required to be focused on and shown in the design of the display style through focal point?
- What is the brand to be displayed?
- Is there artwork that should be used in the display style?
- What is the required position for displaying the product (hanging, on a shelf, sliding...etc.)?

1-3- **Develop:** At this stage, design ideas are developed using one of the design methods banks using manual sketches, then move to the industrial design stage by choosing one of the ideas and building it using 3D drawing programs and presenting the design idea to the client to develop it and take final approval and calculate its total costs before entering the implementation and delivery phase.

1-4- **Deliver:** At this stage, computer programs based on design and manufacturing were used to obtain the executive files and prepare the raw materials for the production processes and implement the design, either by producing the first sample before entering the quantitative production stage or directly if the design was to produce one piece and install it in the place selected for it.

It should be noted that the divergent and convergent thinking method is used according to the stage the design is going through, in addition to that the design processes are iterative and not linear, while adhering to leadership standards and providing the appropriate environment for innovation and linkage between all partners and stakeholders.

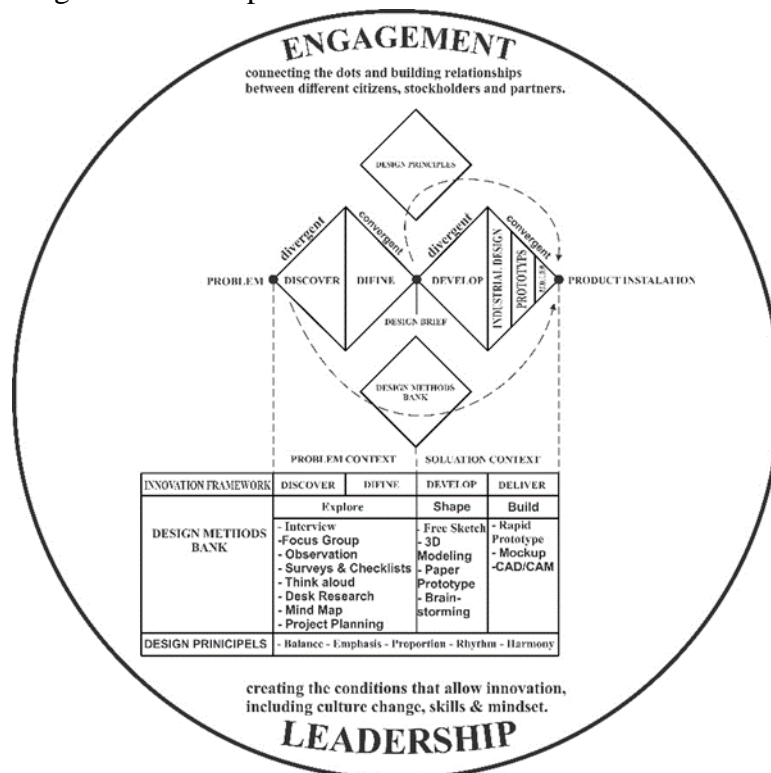


Figure (1) Develop Design Thinking Methodology for Designing Product Displays Techniques in The Field of Industrial Design

2- Application of Design Thinking Methodology for Designing Product Displays Techniques in The Field of Industrial Design in the Egyptian market.

The proposed design thinking methodology has been applied in one of the companies working in the field of designing and implementing product display stands in the Egyptian market through two types of the display techniques:

- Isle unit
- Column fixture

2-1- Energizer Battery Isle unit design

The design thinking methodology was applied in one of the companies working in the field of designing display stands in the Egyptian market, and the researcher applied that methodology and its stages are shown in Table (1), through which the researcher supervised the design of the display unit in the design department, then the researcher took the stage of industrial design through developing the design idea to become capable of production through processing production drawings, determining the materials used, distributing and defining the tasks of the work team in the production departments within the company and delivery of the final product and its installation in the specified place, which is illustrated in Figure (2).

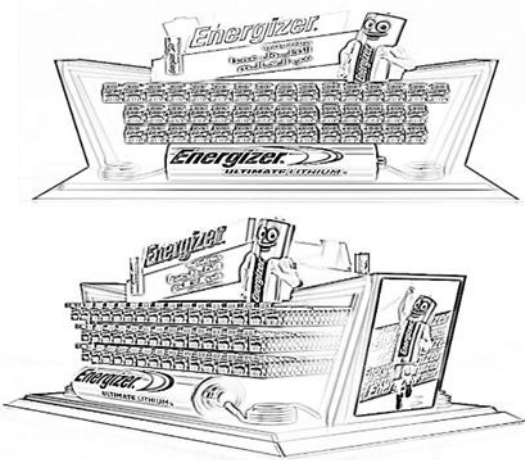



Figure (2) Energizer Battery Isle unit design

Table (1) The stages of applying the design thinking methodology for Energizer Battery Isle unit design

Stage	Descriptions	Used tools
1- Discover	<p>At this stage, research is done to determine the scope and nature of the problem to be identified by directing a set of questions such as:</p> <ul style="list-style-type: none"> • What is the display method to be chosen (Floor stand, Isle stand, counter stand ...etc.)? • What is the available display style space to be taken into consideration in the design? • What is the required function of the display style? • What is the time required to submit the display style? • What are the types of lighting to be used? 	<ul style="list-style-type: none"> - Interview - Checklist - Mind map - Project planning - Brainstorming

	<ul style="list-style-type: none"> • Are there specific elements that the light should be focused on? • What are the basic colors to be used in designing the display style? • Are there specific raw materials preferred to be used in production for the display style? • What is required to be focused on and shown in the design of the display style through Focal point? • What is the brand to be displayed? • Is there artwork should be used in the display style? • What is the required position for displaying the product (hanging, on a shelf, sliding...etc.)? 	
2- Define	<p>At this stage, Briefing Design was developed, through which the requirements to be met in the display style are determined by answering the checklist questions that were applied during the personal interview through the following points:</p> <ul style="list-style-type: none"> • The display style to be designed: Isle unit • Unit area: 240Wx160Dx140H cm. • Display Energizer battery cards • Product size: 11Wx9H cm • Marketing and promotion of Energizer batteries. • The duration of the project is 30 days. • It is preferable to use LED lighting. • The use of black color for the structure of the design and lighting in red. • It is preferable to use durable materials such as sheet metal for the design structure, in addition to plastic materials. • Focus should be placed on displaying the products and the brand of the offered product. • The design should include the Brand in addition to the slogan and the character of Mr. Energizer. • There is an Artwork that will be submitted for inclusion in the proposed design. • Products are displayed hanging through metal bars attached to them and a means of displaying the proposed price of the product. • The shape of the battery can be used in the display style and within the proposed design. 	

<p>3- Develop</p>	<p>At this stage, design ideas were developed using one of the design methods bank techniques as shown in Figure (3).</p>  <p>Figure (3) The free sketch stage and the use of the computer to modify it.</p> <p>Then the chosen idea was developed in the industrial design stage and the technical direction was made, which is shown in Figure (4) to simulate the shape of the final product using the 3DMAX program which is presented to the client for final approval for the preparation of engineering and production drawings.</p>  <p>Figure (4) presentation of the design idea using 3DMAX programs</p>	<ul style="list-style-type: none"> - Free sketch - 3D modeling programs as: - 3D max, Solid works, inventor, Rhino ...etc. - Rapid prototyping - CAD/CAM - Prototype & Mock-up .
<p>4- Deliver</p>	<p>At this stage, production measures were taken within the production departments, and it was determined with what was required in the production of this unit in accordance with the requirements of the design to be implemented with commitment to the time schedule specified for the delivery of the project in the agreed</p>	

time. The display unit was delivered and installed in the previously specified place shown in Figure (5).



Figure (5) The stages of production, implementation, and delivery of the island display unit

2-2- Energizer Battery Column fixture design

The design thinking methodology was applied in the design of the Column Fixture display unit for the products of Energizer Battery Company, the stages of which are shown in Table (2), through which the researcher supervised the design of the display unit in the Design Department. Preparing production drawings, defining the materials used, distributing, and defining the tasks of the work team in the production departments within the company, and the researcher reached to deliver the final product and install it in the specified place for it, which is shown in figure (6)



Figure (6) Energizer Battery Column fixture design

Table (2) The stages of applying the design thinking methodology for Energizer Battery Column fixture design

Stage	Descriptions	Used tools
1- Discover	<p>At this stage, research is done to determine the scope and nature of the problem to be identified by directing a set of questions such as:</p> <ul style="list-style-type: none"> • What is the display method to be chosen (Floor stand, Isle stand, Counter stand ...etc.)? • What is the available display style space to be taken into consideration in the design? • What is the required function of the display style? • What is the time required to submit the display style? • What are the types of lighting to be used? • Are there specific elements that the light should be focused on? • What are the basic colors to be used in designing the display style? • Are there specific raw materials preferred to be used in production for the display style? • What is required to be focused on and shown in the design of the display style through focal point? • What is the brand to be displayed? • Is there artwork should be used in the display style? • What is the required position for displaying the product (hanging, on a shelf, sliding...etc.)? 	<ul style="list-style-type: none"> - Interview - Checklist - Mind map - Project planning - Brainstorming
2- Define	<p>At this stage; Briefing Design was developed, through which the requirements to be met in the display style are determined by answering the checklist questions that were applied during the personal interview through the following points:</p> <ul style="list-style-type: none"> • Display style to be designed: Column fixture design • Unit area: The total dimensions of the display unit are 125W x 125D x 300 cm, noting that the concrete column has dimensions of 60 x 60 x 400h cm. • Displaying the Energizer battery cards through 4 directions during the design of the display unit. • Product size 11Wx9H cm • Marketing and promotion of Energizer batteries. • The duration of the project is 30 days. • It is preferable to use LED lighting. • The use of the dark gray color for the design structure, the columns in silver and the lighting in red. 	

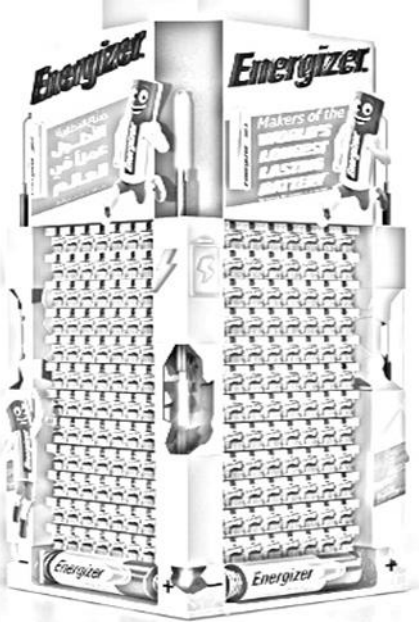
	<ul style="list-style-type: none"> • It is preferable to use durable materials such as sheet metals for the design structure, in addition to plastic and wood materials. • Emphasis should be placed on the presentation of the products and the brand of the offered product. • The design should include the Brand as well as the slogan and Mr. Energizer character. • There is an Artwork that will be submitted for inclusion in the proposed design. • Products are displayed hanging through metal bars attached to it and a means of displaying the proposed price of the product. • The battery shape can be used in the display style and within the proposed design. 	
<p>3- Develop</p>	<p>At this stage, design ideas were developed using one of the design methods bank techniques as shown in Figure (7).</p>  <p>Figure (7) The free sketch stage and the use of the computer to modify it.</p> <p>Then the chosen idea was developed in the industrial design stage and the technical direction was made, which is shown in Figure (8) to simulate the shape of the final product using the 3DMAX program which is presented to the client for final approval for the preparation of engineering and production drawings.</p>	<ul style="list-style-type: none"> - Free sketch - 3D modeling program as: - 3D max, Solid works, inventor, Rhino ...etc. - Rapid prototyping - CAD/CAM - Prototype & Mock-up .



Figure (8) presentation of the design idea using 3DMAX programs

4- Deliver

At this stage, production measures were taken within the production departments, and it was determined with what was required in the production of this unit in accordance with the requirements of the design to be implemented with commitment to the time schedule specified for the delivery of the project in the agreed time . The display unit was delivered and installed in the previously specified place shown in Figure (9).

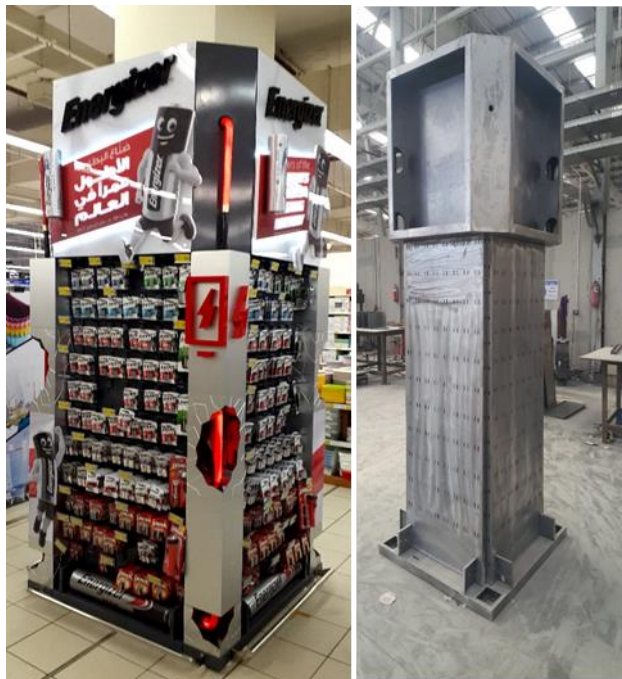


Figure (9) The stages of production, implementation, and delivery of the island display unit

3- The Industrial Designer Role in Designing Product Displays Techniques

Through the applications of the thinking methodology that was developed within a company in the Egyptian market, the researcher was able to elicit and determine the role that the industrial designer plays with the work team in the field of designing displays techniques through the following points:

- Conducting interviews with clients and benefiting from the methods of collecting information, whether by interview or observation, or using checklists etc. from the methods included in the Design Methods Bank.
- Discussing the Brief design with the client and determine the main message that should be included in the display style.
- Gaining an in-depth understanding of the client's organization, its products, image, and the target market.
- Considering important design factors such as the space available for display and any special features that must be combined, in addition to considering the design principles while developing design ideas.
- Creating design ideas, images and graphics that include the client's logo and company colors and discussing them with the client.
- Review designs according to customer feedback and other members of the design team.
- Preparing executive drawings and specifying the proposed materials for design production.
- Oversee the production of the selected design, check quality and ensure project is completed on schedule.
- Researching lifestyle and design trends and ensuring that designs will appeal to the target audience.
- Making the target audience happier, satisfied and psychologically and socially stable by solving their problems, meeting their needs, achieving their desires, and finding the best innovative solutions to display their products.

4- Results and Recommendations

- Develop a methodology for design thinking that can be applied in designing product displays techniques in the field of industrial design.
- Determine the role that the industrial designer plays in the process of designing displays techniques.
- The design thinking methodology is an effective model for solving design problems and improving the quality of life.
- The design thinking methodology centered around the user by understanding his needs and desires and including them in creative and innovative design solutions.
- Design Thinking is a dynamic creative process, not just a beautiful product or design.
- The stages of the Design Thinking methodology are characterized as parallel stages and may be repeated for the purposes of review, reform, and modification.
- Determining the design methods bank tools to benefit from while designing the displays techniques.
- Considering the design principles such as balance, focus, compatibility...etc. in designing product displays techniques.

- The use of different thinking patterns during the application of the design thinking methodology, such as the divergent and convergent thinking pattern during the application of the stages of the methodology.
- Paying attention to design thinking methodologies and including them in research and scientific theses.
- Applying the design thinking methodology in the field of teaching product presentation methods in industrial design field.

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