

Role of Jewellery Design Process in Evolving Economic Consideration Towards Fourth Industrial Revolution (IR 4.0)

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Received: 19 March 2022; Revised: 10 April 2022; Accepted: 10 May 2022; Published: 30 June 2022

Abstract: Designers emphasize their role in shaping future technology by being test-beds for innovation while at the same time educating consumers to appreciate creativity in jewellery design. In doing so, problems thereby raised would be on two important factors relating to design. Firstly, on how the jewellery design process is developed for the market place. Secondly, on how they are practiced. These two considerable issues receive scant consumer attention. The rationale reflected in this empirical study is important to establish clear context for design process in relation to sensory aspects of value and commercialization. The evolution of jewellery designing has contributed greatly towards state-of-the-art industrial and technological advancement. The imperative question asked is how to accomplish design activities can be carried out in contrast to other economic and cultural activities with the recognition of Designomics. The implementation of design process will be transformed with the extension of a developed knowledge base economy affected by the Fourth Industrial Revolution Design Technological Innovation Towards Industrial Revolution 4.0 embodies aspects if technologically embraced would transform design innovation. Finally, the paper demonstrated challenges towards designing the entire customer experience and product commercialization despite its viability from discovering what people really need, to shaping interactive solutions and creating a set of distinctive jewellery which is both aesthetically pleasing and customer-friendly.

Keywords: *Jewellery Design, Design Economic, Design Process, Jewellery Industry, Product Design*

1. Introduction

The Fourth Industrial Revolution (IR 4.0) urges the employment of creative thinking for manufacturing, value chain, distribution and customer service processes. IR 4.0 provides the platform for different opportunities available to shape the role which can be undertaken by designers.

The revolution leads to a new level of production processes through the introduction of customized and flexible mass production technologies. This is possible by introducing of self-optimization, self-knowledge and self-customization in the industry. The manufacturers can communicate with the computers instead of operating them. Exploring the design process of jewellery in computers and

communication technology, it seems to combine the strength of traditional design concept with the increasing trend of contemporary methods, presents necessary steps to scale quality jewellery design. This concept which has important social significance provides space to the market place which may attract the general public's concern.

The future of jewellery design field emphasizes the immense need to look beyond these areas and strategically utilize the design innovation to prepare the coming workforce for future challenges. Designomics is where design drives economics to inspire designers to actualize ideas that meet needs and wants of consumers in their daily life. In line with meeting the market demand in the jewellery

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marketplace, the Designomics concept and approach are seen as artistic stimulant to better match the needs of consumers.

This project provides insight on how different ideation with strong supporting input is applied in the various design stages which involves a variety of stakeholders, such as customers, competitors, distributors, suppliers etc. The whole concept of idea generation and development as essential part of the design process are derived from the said combinations. Customer feedback is a vital activity throughout the development stage; to ensure accuracy of product design and to expedite development towards a purposeful defined target.

Experience and manual sketching are still a pivotal part of jewellery design prior to the 3D software transfer and drawing in order to realize the prototype. The process of designing the Infinity Knot (IK) ring starts with a sketch. The success of this project will be evident on the end product, the size and scope of demand, the designer's style, experience and work-flow; all of which should meet the market expectations. The IK ring project is defined by an allocation of agreed budget, well thought of work processes, time management solution, raw material resources, and a direction agreed upon with the client.



Figure 1a: The designer develops and define the Infinity Knot in detail, necessary to a client's need



Figure 1b: process of jewellery design by Adobe Photoshop sketch apps



Fig. 1c: detailed sketch before transferred to JewelCad.

Figure 1a, b and c show a concept idea based on initial client with designer communication. Once the sketch is refined and finalized, the design moves to the next stage

with computer aided software for fabrication purposes. Hand-drawn sketching plays a prominent role in the designing process. This stage allows the designer to explore design with the freedom of creativity. Sketching is a staple in the creative process and a good medium. A designer keeps a drawing journal to experiment with ideas by understanding the clients' needs and desires. The overall concept and direction or angle of a jewellery piece may be perceived as achievable at first but with the presence of one element which may not be appropriate, the idea may not materialize altogether. Often, this can be corrected with further analysis and sketching. Here again, at some point the designer will emphasize the design towards a CAD process. Specifically, the designer will use JewelCAD to better present and impress a client for prioritization and choice of material leading to definite decisions.

From the brief project given, there is sufficient information either described or implicit, to prepare a generic economic value such as details for material and workmanship costs. Consultation is organized by the jeweller to educate clients for their better understanding which will provide valuable feedback prior choosing and agreeing on a design. Jewellery design is not only the art and science behind the philosophy but it is a journal of developing and bringing a good design to a high-end jewellery product. The third era of industry came about with the advent of computers and the beginnings of automation, when machines began to replace human workers on those assembly line. Meanwhile, IR 4.0 in which computers and automation will come together in entirely new way, with machineries connected remotely to computer systems equipped with machine control with little input from human operators. The logic of manufacturing synchronization can be seen in technical processes. This process is therefore suitable for a factory which has directly implemented out mass production.

2. The Jewellery Design Process – Design for development and capability approach

In order to establish the capacity of the jewellery design process, a clear conceptual model or blueprint and specific experimental tools need to be developed. The number of ideas generated by the customer is most connected to the success factor of the idea generation phase. As developed in Figure 2, designer and jeweller should focus on customer-based (user) ideas, such as focus groups; detailed one-on-one interviews, site visits by technical staff; active customer inquiry by sales forces; and relationship development with leading users (1).

The success factor for this phase as per researchers' studies shows that a thorough understanding of the needs and wants of the customer is vital to the success of the new product. (2,3). Customers' voice drives the success of businesses with winning new products. A strong customer engagement is needed right from the generation stage of the idea. Souder (1987), concluded that externally generated ideas produces a higher success rates for new product development (4). A

higher success rate for project ideas originate from marketing and customer survey feedback rather than from

research and development (R&D), suppliers or management (5).

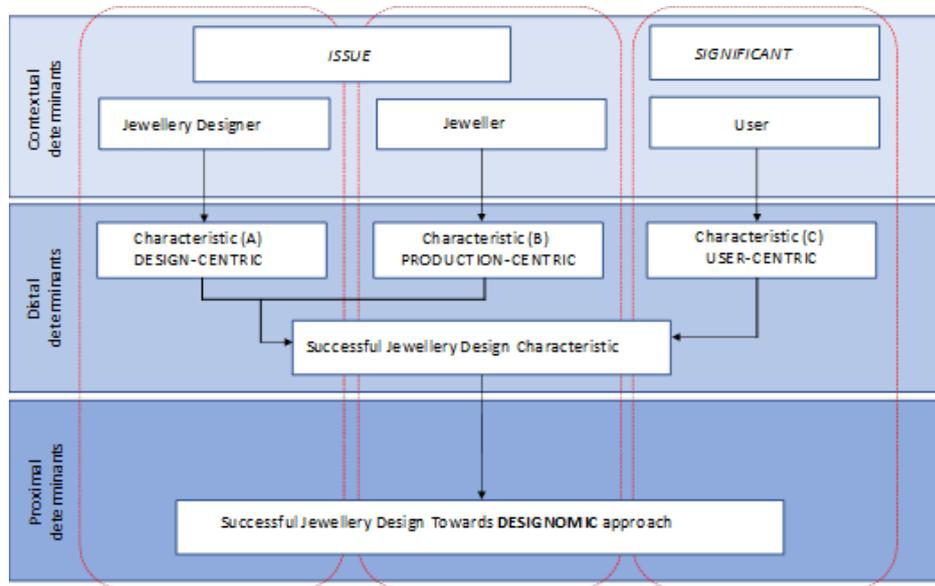


Fig. 2: The framework of jewellery design process incorporating economic views in jewellery product.

These combinations exhibit the whole concept of idea generation and development as an essential part of the design process. The original research results obtained prior to the development may not be sufficient to resolve all the design issues during development (6). The diagram level shows that a design flow is deployed in:

Contextual Determinants: This level shows on how to get a clearer idea of current jewellery industry demands, designer and jeweller has to conduct extensive research to identify factors and characteristics of the success and failure in design; making them indicators for good design guidelines.

Distal Determinants: This level shows how the problem came about with each strength of the designer and the jeweller meeting customer for direct input, ad-hoc style change, product line extensions or product improvement projects based on specific target research based on current demand and design style.

Proximal Determinants: This level determines the recognition and application of design economy as a culture. The design process innovates the product, the style of communication to produce design-driven and outstanding jewellery as a differentiation strategy. This ensures that DESIGNOMICS is the most successfully and widely use in the jewellery design approach.

In today's complex environment, the designer must identify problems, select appropriate targets and implement solutions, because there is so much design work in teams, a senior designer might also be expected to assemble and lead a team to develop and implement solutions. The designer is

a synthesis who helps to solve problems and a generalist who understands the range of talents that must be engaged to realize solutions. The designer organizes teams more talents are needed. He is a critic whose analysis after the solution considers whether the right problem has been solved. Each of these tasks may involve working with research questions, all of which involve the interpretation or application of some aspect or element that the research reveals.

The design and economic approach were therefore identified to address the designer, retailer (jeweller) and user challenges in the jewelry industry. The jewellery design industry has to respond to its fast-evolving needs. This change has forced jewellery designer and jewellers to implement a low-cost strategy without compromising high-quality standards of their products and services (de Mozota, 2006). Design economic or Designomics is an intelligent business intervention practiced by designers at convincing clients through design.

Designs and economics idea generation

In 1969, Herbert Simon declares that it is possible that design becomes a way of thinking and it was important to leave 'the thinking process' to the designers. Subsequently, Rolf Faste (1986), expanded the idea as a method of creative action. Meanwhile, according to Elizabeth Galton (2012), jewellery design has evolved through the centuries according to social and economic factors of the time. The knowledge of jewellery design evolution and its relationship to business approach is important.

Designers creating innovative jewellery are aligned with history as well as how social and economic factors have influenced design in particular. Designers should deviate

from their comfort zone and see the world through an intelligent and emotional relationship. In the design process, the designer is the domain expert who will start with an attempt to meet customer requirements.

This phase is to relate how suitable the design ideas explore the economics space. These four steps of information play important roles in the development of the jewellery design

process, although these approaches should not be seen as mutually exclusive, but rather serve the purpose of successfully designing the jewellery. However, it is the interpretation of this information by the designer and jeweller. This information then shapes design systematically.

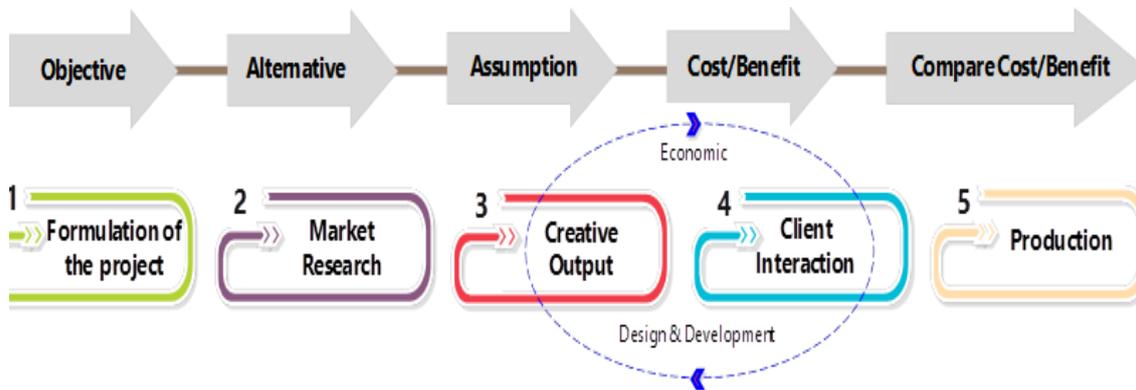


Fig. 3: Heuristic diagram for design analysis of the proposed jewellery design process

Figure 3 illustrates a basic requirement for the process of design. It is necessary to develop a methodology to further extend the design in the earlier phase of the design process (conceptual stage), which ideally should have some universal features, as described in Distal Determinants. A procedure with a quantifiable result to guide the designer towards his or her goal of satisfying the users' needs or desires is needed. Cross (2001) points out that although the different models of the design process all have a common aspect, i.e. the need to improve traditional working methods in design, it is not clear whether the different models are the same. (7).

The economic characteristics are the core of the design venture, and its become customer value and market opportunity. Highlighted on stage three (creative output) and four (client interaction) determine a process of implication for design development and integration of economic consideration. In mature markets, attention is focused on visual characteristics of jewellery rather than the functionality and its performance. Attention to the appearance of a product promises one of the highest returns on investment (Jordan, 2000). Whereby, at the fifth stage (production) this is the role of the industrial revolution.

Development of new design processes, methodologies, strategies and procedures in jewellery designing is much more important due to the fact that end-users' needs are far more relevant nowadays. This criterion adds to the demands placed on designers (8). This stage needs time to time enhancement and improvements. Design thinking is fundamental to business design and understood as a human-centered approach to creative problem solving, where design methods and mindsets are applied to address business challenges (9). Outcome in this paper is an approach and practice from the designer-jeweller-user towards an integrated jewellery design process through the

economic context of understanding customers' need as a consistent theme combined with the outcome of empirical data as well as personal communication input from jeweller. The jewellery design process guides both visually appealing as well as highly wearable jewellery. A successful design concept has the power to inspire reinterpretation and turn leads into trends.

3. Methodology

The role of the Designomics approach towards the significance of jewellery design is the descriptive research. The researcher conducted a survey to gather information from the samples of a targeted population. The process of developing the conceptual framework is through design and economic value perceived through jewellery. This is a descriptive and qualitative market research methodology (10). To acquire a deep understanding of the customer's lifestyles or cultures, researchers spend time in the field observing customers and their environment as a basis for better understanding their needs and problems. The design process was developed based on interview results from the jewellers in Malaysia's jewellery industry. The most important core competencies were in the manufacturing sector. The competitive strategy type most employed is the differentiation-based strategy.

The proposed framework should be of value in integrating some of the diverse research in this area and suggesting specific relationships that could benefit future empirical studies. Designers use their skill, training and experiences to produce positively inducing aesthetic and impressive products. Their tacit understanding of perception and visual composition generally guides their intuitive judgments (11,12). There are designers who are guided to feel that intuitive creativity is the all essential for production of visually attractive products; and that scientific approach is

irrelevant. This mentality is reinforced by findings that very few of scientific studies have led to generalisations that are useful for students or practitioners of design (13). In the meantime, designers and consumers often interpret products differently due to different aesthetic preferences. (14). Therefore, as much as styling is acknowledged as the artistic part of product design, it still must be in the direction of opportunities but held within defined constraints (15). Design modification is closer aligned with consumers' aesthetic preferences by measuring their responses and correlating perceptions with product features (16).

3. Result and Discussion

Results of the work and discussions are presented here. The challenge for the designer is to iteratively customize a balanced selection of imagination and ideation, which support the design and initial back-end development processes in the most effective and economical way. The designomics context has sought to justify the numerical and quantitative values that dominate business processes. Since designers working domain is the firm, a major emphasis in discussing the role of design needs to be at the microeconomic level and encompass a greater degree of qualitative factors. Apart of economical perspective, this study reveals how the flow of design process influences when, how and to what extent design changes are allowed, with respect to the design progression. Designomics allows the designer and jewellers to establish freedom in designing jewellery, whereby it perpetuates flexibility in producing a piece of jewellery that is lighter in weight, contemporary in design but highly attractive to the mass market. A concept and approach intentionally developed, Designomics is a process to identify and establish the successful jewellery design characteristics in the product definition stage of the design process.

All work accomplished through this research serves as expressions, to which the piece is meant as an object for a specific design involved in the research, not as a prototype for mass production. It is an approach that echoes tradition within craft and jewellery design practice. The jewellery poses a bold design of concept of the Designomics approach.

4. Conclusion

A consumable product is good from a business perspective, and product innovation is often influenced by market performance and should be developed through proper planning with a systematic process, whereas the successful product characteristics and product design specification should be satisfied and identified through the user needs. After looking at and taking into design demand in jewellery market and product criteria, we feel strongly about our product idea (IK ring) and the potential market for it. Some highlights that really stand out to our team are the low cost to start this business, strong search demand, trend trajectory, and low competition keywords that we feel we could rank

well for in this industry over time. A large part of the potential success of our product idea would come from being able to develop a product that is notably better than just jewellery items on its own, building a brand around it and ranking high for the keyword opportunities we identified. In order to ensure the right of the product, IK ring has been proposed for registration with the Intellectual Property Corporation of Malaysia (MyIPO) to protect industrial design and overall appearance of a product.

Acknowledgements

The authors would like to thank the following people for their fruitful dialogue, my colleagues and the anonymous audience from the previous conference, thanked for their valuable comments and ideas; it is contributed to the refinement of the contextualization approach for the study. This support is thankful to the Ministry of Higher Education (MoHE), Universiti Teknologi MARA and Universiti Putra Malaysia.

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