CSCanada
Canadian Social Science
Vol. 14, No. 12, 2018, pp. 62-66
DOI:10.3968/10765

ISSN 1712-8056[Print]
ISSN 1923-6697[Online]
www.cscanada.net
www.cscanada.org

Design Thinking Exploration From Three Disciplines That Influence Industry Development

GU Yunyao[a],*; HE Siyi[b]; LIN Xinye[c]

[a]Department of Industrial Design, Rhode Island School of Design, 2 College St, Providence, US.
[b]Department of Landscape Architecture, Rhode Island School of Design, 2 College St, Providence, US.
[c]Department of Architecture, Rhode Island School of Design, 2 College St, Providence, US.
*Corresponding author.

Received 13 September 2018; accepted 25 November 2018
Published online 26 December 2018

Abstract

This essay examines how design thinking impacts three different disciplines and fields via comparing the growing development on its definition during its extensive integration. Specifically, the comparison ranges from visual perception to the product development; in a larger scale, from management of individual organizations to social and global area.

A few cases are utilized to elaborate the core design and development activities on product development, including the utilization of sketching in visual art, global business extension of Ford Motor Company. Then, by combining how design thinking speeds up the innovation in various industries, observations from the surveys and researches are also enlisted to generalize improvements achieved within certain aspects of the system. Furthermore, to sustain a better future environment, design thinking calls for more commitment in sustainability, especially in social and global aspects.

Key words: Design thinking; Discipline; Perception; Management; Sustainability

Gu, Y. Y., He, S. Y., & Lin, X. Y. (2018). Design Thinking Exploration From Three Disciplines That Influence Industry Development. *Canadian Social Science, 14*(12), 62-66. Available from: http://www.cscanada.net/index.php/css/article/view/10765
DOI: http://dx.doi.org/10.3968/10765

INTRODUCTION

As we all know, design thinking, nowadays, has been developed into an effective toolkit for innovation, with advanced application in various disciplines, such as fine art, product development, business management, and social regulation.

In the past, based on the consideration from designers, design thinking is more related to a concept feathering three main characteristics, including humanitarian wellbeing; material availability and resourceful technologies; and the restrictions and business chances. Nevertheless, with advanced development of society and technology, the integration occurs spontaneously, combing the three factors above. At the same time, the integration is used to be analytical and emphatic, rational and emotional, and methodical and intuitive (Tschimmel, 2006, pp.414-420)

In early stage, with preferred interpretation as a mindset, design thinking was generalized into a certain definition: a combination of divergent and convergent thinking, a user and customer centered orientation toolkit benefiting both research and prototyping. As its definition going through development, design thinking is seen as an innovation process consisting of these procedures: “Define the objective”, “analyze user need”, “Ideate”, “Prototype” and “Test”. While nowadays, a growing number of companies, especially for those consulting firms, and universities use design thinking, continuously enlarging their scales and re-defining its management regulation, elevating platforms. In the near future, design thinking is expected to be deployed as an innovative method in corporations and also become an integral part of management education, particularly innovation. In addition, it will be developed further at the interface of design, design management and engineering sciences (Brenner, Uebernickel, & Abrell, 2016). Essentially,

with more newly added interpretations, design thinking, no longer can be generalized or concluded into single definition.

Thus, design thinking is more about thinking in new and different perspectives, bridging growing amount of future possibilities, which is also an approach without fitting into existing models. Besides, what's also worthy noticing is that it can be a new method of thinking methodology, inside which senses and emotions are just as imperative as rationality. This paper is planning to get through the different definitions and understanding of design think under various circumstances. And dialectical discussion will be made at the end of this article.

1. BACKGROUND

1.1 Facilitating Visual Perception

In visual perception area, design thinking plays a special role in the image art, because the visual sense comes to be the first place and the most intuitive way for people to get perceptions in the world. Related to the concept of perceptive cognition, design thinking can be more addictively defined as a specific path for creation and ideation. During the creation of visual art, perceptive cognition is usually understood as a complicated process of exploiting at one as well as stimulating the input. Both of those procedures are augmented in multiple segments of the creative design process, which means design thinking helps clarify the complexity during creative brainstorming and ideation, as a Perception-in-Action Process (Kalargiros & Manning, 2015, pp.293-327).

Goldschmidt Lawson, a researcher in visual perception area suggested that it is valid for designers to figure out problems and corresponding solutions by using sketches, drawings and other material models. The act of visualizing their thoughts is becoming beneficial to elaborate designers' ideas, which is proved by an observation that Goldschmidt conducted during her various publications, regarding on visual formation and advancement of ideation. Goldschmidt argues that sketching, an extension of 'mental imagery', has become the expansion of the problem space of the task, to the extent of including and even discovering, new aspects, especially accelerates the visualization of designers' thoughtful projection inside their projects.

It is pointes out by Goldschmidt that thinking in multiple perspectives about future possibilities is becoming a harder process which requires purely internal mental processes; interactions with an external representation are highly valued. In this sense, Goldschmidt concludes that visualizing ideas through sketching "provides a temporary, external store for tentative ideas, and supports the 'dialogue' that the designer has between problem and solution" (Tschimmel, 2006, pp.414-420).

1.1.1 Sketch

When it comes to sketching, a boosting activity of ideation, designers often utilize it as a specific modulation tool aiming to narrow down problem-solution space, as well as clarify the task the design thinker is working on. Besides, with the mental support that visualizing provides, designers also benefit from the playful aspect of sketching, in which the model making gives pleasure. This process, in turn, helps his concentration and perceptive sensitivity. Similarly, sketching also boosts the thinking procedure, in the same way as early prototyping -- another way of visualizing and testing new solutions.

Therefore, sketch, not only is a visible deliverable from ambiguous design thinking process, but also visually manifests concepts, transforms an idea in a testable model. In this sense, it is playing an indispensable role in the creative design process.

1.1.2 Rapid Prototyping

For lack of enough information about a project, designers usually confronted with phenomenon that there is never enough of the crucial, rapid prototypes, which restricts testing of early product or business details, forms and nuances. However, rapid prototyping materials are cheap, in which sense it ensures several times of failure happened during early stage of ideation. Moreover, strengthening the function of products, test and iteration- key process of rapid prototyping- enable the acceleration of concept development, insight generation, which also plays a vital of to elevate design thinking enforcement.

To conclude, it is imperative to seek deeper interpretation of failure and pursue further analysis of it, which makes more sense to differentiate design thinking in visual perception, from its application in traditional business thinking way. With capability to handle incomplete information as well as ambiguous situations, design thinking enables designers to ease discomfort related with unknown directions.

2. BOOSTING BUSINESS MANAGEMENT

Taken as toolkits tackling diverse global customer needs, design thinking is becoming a widely adopted, accelerating more innovative value built on global platforms. Specifically, it has become a global strategy. Because there have been several global programs dedicated to offer bold and high quality design works, so as to fuel economy leadership, to top safety ratings, and to accelerate technological innovation. For example, the extensive build-up of global platforms and engineering centers of Ford Moto enables greater and more competitive offerings, allowing the reduction of brand discounts, increasing revenue across their product portfolio.

"We believe the result of our efforts will be continuing profitable growth for all of our stakeholders." (López &

Luis, 2014) Ford Motor Company, known just as Ford, has been influentially leading a global automotive industry for decades. It is based in Dearborn, Michigan, which is also known for its delivery of world-class vehicles with great performance in quality, fuel efficiency, and safety. In 2012, FoMoCo (the abbreviation of Ford Motor Company) completed its fourth year in a row of improved annual operating profits (López & Luis, 2014).

Nevertheless, difficulties grow as the business scale extends. It is confirmed by the chairman of Ford that in the near future challenging issues will be confronted since the ongoing economic uncertainty, rising fuel and commodity costs are growing. There also comes higher requirement of carbon dioxide (CO2) emission. Furthermore, not only the economic but also the environment continue suffering the significant challenges brought by the vehicles with increasing quantity (López & Luis, 2014).

However, in recent years, via adopting new business management strategy integrated with design thinking, Ford Motor Company has been progressively taking a commit to platform consolidation. In 2007, 27 vehicle platforms were utilized. In 2014, the company launched 14 new total platforms and 9 core platforms globally. All this has been possible through the "hub and satellite" approach in product development. In this case, design thinking, focusing on strategizing platform consolidation, has helped Ford Mexico towards the goal of advancing global sales and taking more market share. Also, design thinking supports improving the environmental issues caused by vehicles and operations (Growth, n.d.).

Beside, in terms of global aspect, extensive growth of engineering centers, also boosted Ford Motor Company toward a more promising product development direction. Ford of China, located in Nanjing, China has More than 500 engineers working on Research and Development, Purchasing Cost Estimating, Manufacturing and other support functions. The office also maintains a growth of 85% on invention disclosures for Ford Motor Company from 2011. Ford of Brazil, located in Concessionária, Brazil is the home of the Product Development engineering team that has been working on small "B" vehicle platforms such as the Ford Eco-Sport from product planning, design, development, testing and to launch phase. The product development center is right at the manufacturing and assembly site and it has more than 12,000 professional engineers (Growth, n.d.)..

3. ACCELERATING SUSTAINABILITY INTEGRATION WITH SOCIAL AND GLOBAL IMPACT

There exists a raising demand from the economic and environmental realms to get much of the focus for sustainability, which specifically introduced design thinking to an important area for creating principles of sustainability. Besides, it is never too late to note that global environmental issues, the US housing market, and your neighborhood organic food store all bring up questions about the value of sustainability as concept to live by.

One set of sustainable design principles that summarizes sustainable activities into three categories: "use materials in continuous cycles"; "use continuously reliable sources of energy"; and "come mainly from the qualities of being human" (Newcomb, 2012, pp. 593-615). With regard as sustainable resolutions, these resources are also renewable for being built back up again. In addition, these qualities allow for variation of resources along with periods of plenty and of want.

Generally, it implies that design thinking, in terms of significant planning, improves the in-take of governmental administrations in long-range directions.

Moreover, macroscopically, it also can suggest an important ethical and systematical aspects of sustainability imply: we are meant to live our lives in a closer approach – being practically interact the diverse products and experiences. Design and rhetoric are inextricably intertwined, and both are about action and "creation" in the world. Sustainable design means thinking about "how we should live our lives" in ways that take long-term and nonhuman interests into account. Below, we explore specific ways that the ideas of both design and sustainability have been used in relation to composition studies—including design as a visual issue or a technical writing issue. To elaborate, sustainability, as an environmental ethic, and in terms of systems and diversity thinking, provides a useful approach to context and time for writing. Furthermore, it can shift the way of thinking towards one focused innovative aspect, and can be part of creating valuable habits of mind for writers (Newcomb, 2012, pp. 593-615).

Based on current situation, researchers observed that sustainable management procedure based on design thinking, includes a variety of interrelated systems from defense internal affairs. It does not include everything, such as environment or land of the nation, but it does attempt effects of the different originally articles. It is less rational to suggest establishing more grand principles.

Working out sustainable design thinking can advance governmental administrators to shape ecological metaphor in which activities, actions, and phenomena into interdependent, through feedback. The three central features of ecologically based them are "interdependence, diversity, and feedback" should be taken into consideration.

For better processing the suitable administration in social and global areas, it is imperative to emphasize more on harmoniously balancing and imagination for the chaos and order.

To conclude, design and sustainability together can be more central to rhetorical work as a habit of mind than

the visual and artistic versus technical aspects of design suggest, and more than even the important ethical and systems aspects of sustainability implication.

4. INTERVENING POLICY FAILURES AND IMPROVING PUBLIC VALUE

As a promise of assisting policymakers for improving political issues, design thinking is also applied to upgrade interventions and provide better services. To some extent, the public value of design thinking is to offer high quality user experience. However, design thinking is neither the replacement of existing policymaking form nor a panacea that could solve all the problems. The greatest advantage of design thinking that it could provide contingent solution paths to the various issues regardless of the diversity (Mintrom & Luetjens, 2016, pp. 391-402). To be specific, design thinking serves as an alternative viewpoint of coping with existing or upcoming challenges in decision-making for the governors.

For instance, a researcher named Lykketoft points out that there exists certain phenomenon that some curated labs or organizations, claiming with innovative capabilities, as a whole are still not yet manageable of shaping the wanted transformation. In that sense, the role of boosting improvement for policymaking could also be achieved by incorporating design with existing co-design organizations or boundary spanning organizations, ensuring best practice in policymaking (Pautz & Schnitzer, 2008, pp. 450-475).

Sit within the broader amount of citizen-centered approaches, nowadays, design thinking is more regarded as approaches empowering passive citizens and organizations, getting a clearer perspective of governmental policy and services. At present, varied and scattered as design thinking is, publically, it is till preferable in manifesting demerits of traditional approaches, implementing public policy are less effective.

CONCLUSION

To conclude, this essay elaborates how design thinking is conceptualized after varied interpretation, gradually being developed throughout integration within diverse disciplines and industries. Meanwhile, with deployed as corporation based innovative method, design thinking also implements management, particularly forming an integral part of business advancement.

As a rapid changing ideation, design thinking is not fully developed and essentialized. Being a conceptual practice, rather than normally perceived as an individual subject, it is more potentially to be universal in scope. Thus, there is not without critics to say that concrete descriptions of the design thinking are usually of limited value.

In terms of the ambiguity of design thinking, the value of design thinking as an effective approach is rapidly being more and more complicated, on the ground that the benefits finally depend on its acceptance and practices of its application in each setting. Meanwhile, how implementation efforts are evaluated, from a short-term perspective, can lead to failures because many intended effects are still realized and came into forms in the long term. Apart from that, it is also worthy of noting that design thinking is high dependent on certain medias to operate, such as time, space, and authorization.

These characteristics of design thinking manifests that with potentials being undermining the efficiency, users' understanding and intent is the key to effectiveness. More regards about access to services and efficiency should be emphasized, rather than utilized to balance between performance, quality, and safety (Kaplan & Norton, 1993, pp. 134-147).

Achieved as improvements are, within certain aspects of the system, they were not sustained. There is still a challenging fact existing that approaches to policymaking, especially for agencies to develop and adopt more citizen-centered platforms and services, will be calling for further evolvement.

Given its potential benefits, it is obvious to regard integrating design thinking into policymaking processes as a valuable practice. Nevertheless, a key question still remains: how design thinking might be more integrated into processes and capabilities in various industries.

In the future, as artists, designers, researchers, or administrators, it is highly imperative to have a deeper understanding concerning user engagement, policy design, program development, implementation, and social outcomes. So as to completely institutionalize design thinking in multiple industries, careful consideration is meant to be paid to the skills. Thus, different methodologies should be according to the scenario changes, especially in policy analyzing. Effective and agile management to support policy-making requires cross-agency and cross-jurisdictional relations. And efforts are needed to determine a better direction for design thinking application improvement (Fountain, 2013).

REFERENCES

Brenner, W., Uebernickel, F., & Abrell, T. (2016). *Design thinking as mindset, process, and toolbox*. Design Thinking for Innovation. Springer International Publishing.

Fountain, J. (2013).*Implementing cross-agency collaboration: A guide for federal managers*. Washington, D.C.: IBM Center for The Business of Government.

Growth, P. D. (n.d.). Ford launches major product acceleration in Europe: Targets profitable growth with new cars, suvs and cvs. *Ford of Europe*.

Kalargiros, E. M., & Manning, M. R. (2015). Divergent thinking and brainstorming in perspective: Implications

for organization change and innovation. *Research in Organizational Change & Development, 23*, 293-327.

Kaplan, R., & Norton, D. (1993). Putting the balanced scorecard to work. *Harvard Business Review, 71*(5), 134-147.

López, A., & Luis, A. (2014). Incorporating the innovation process in a product development organization. *Engineering Systems Division System Design and Management Program. Massachusetts Institute of Technology*.

Mintrom, M., & Luetjens, J. (2016). Design thinking in policymaking processes: Opportunities and challenges. *Australian Journal of Public Administration, 75*(3), 391-402.

Newcomb, M. (2012). Sustainability as a design principle for composition: Situational creativity as a habit of mind. *College Composition & Communication, 63*(4), 593-615.

Pautz, M. C., & Schnitzer, M. H. (2008). Policymaking from below: The role of environmental inspectors and publics. *Administrative Theory & Praxis, 30*(4), 450-475.

Tschimmel, K. (2006). Design thinking as an effective toolkit for innovation. *Transplantation, 82*(1), 414-420.