*Human-Centered Design and User Experience,* Vol. 114, 2023, 466–477
https://doi.org/10.54941/ahfe1004265

# Speculate the Future Roles of Design With the Changes in the Economy, Technology, and User Generation

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## ABSTRACT

Recent technological advancements and the shift towards Generation Z as major consumers have driven significant changes in market demands. In addition, the global economy is transforming into an experience-oriented approach. As a result, designers must reevaluate the future impact of design in the industry. The study aims to examine the future significance of design and its impact on the industry, providing the necessary skills and abilities for design professionals to improve their understanding of future trends and the influence of design in their field. The study used qualitative methods to examine the roles of design, investigate local service design in Taiwan and international experience design cases, interview design experts, and analyze trends in social, technology, and economics to determine future roles and capabilities. The research results serve as a valuable reference for designers in their future work, informing talent cultivation strategies and job descriptions for companies, and aiding in resource allocation in the design field for governmental and educational institutions.

**Keywords:** Future of work, Roles of design, Design ability, Technology trend, Experience economy, Generation Z

## INTRODUCTION

The rapidly changing environment has led to a need for a re-evaluation of the role of design. IDEO, a globally recognized design and innovation firm known for its substantial contributions to design thinking, has introduced a concept of 3 innovation lenses: viability, feasibility, and desirability (Et and Ideo, 2011). Business viability, technological feasibility, and human desirability changes are key factors impacting design in recent years.

Firstly, the transition of the global economy from a product-oriented to a service and experience-oriented approach has marked the advent of the experience economy and the proliferation of diverse business models, requiring designers to consider the consumer experience in addition to product functionality (Lai, Huang, and Joseph Pine, 2022). Secondly, technological advancements such as Immersive technologies, blockchain, and artificial intelligence(Panetta, 2018; Gartner, 2021), have significantly influenced the direction of technological innovation and gradually altered the capabilities

 

required of designers. Finally, due to the critical impact of technology, the coexistence of five distinct generational cohorts with diverse values, consumption habits, and behaviors is leading to ongoing shifts in market demand (Dimock, 2019). Moreover, the dominant force in consumption is shifting from Generation Y to Generation Z, which is just entering the workforce and has significant consumption potential (Critical, 2016; Dorsey and Villa, 2020).

As the professionals balancing user needs (desirability), technological feasibility, and commercial viability, designers must proactively anticipate the future and adapt their skills accordingly. This study seeks to provide insights into the future impact of design on industry innovation, the changing roles and responsibilities of designers, and the necessary capabilities for success in the field. The expected contributions of this work include proposing a framework for research on design impact, investigating the role and required capabilities of future designers, and providing a framework for designers to assess their capabilities.

The paper is organized as follows. Firstly, it describes the study process and methods employed. Subsequently, we expound upon the results, which encompass insights integrated from expert interviews and analyses of generational cohorts, technological advancements, and economic trends. Finally, we address the contribution of our work and its limitations and identify potential areas for future research.

## STUDY PROCESS AND METHODS

This section outlines the methodology employed in the study, presenting a comprehensive overview of the research methods and analytical framework utilized to investigate the impact of design. This study adopts three qualitative research methodologies: case studies, interviews, and trend data analysis.

- Case Study Research and Secondary Research—The study focuses on two distinct categories of design cases: 6 local service design cases from Taiwan and 12 international cutting-edge experience design cases. The examination of service design cases from The Design Information Thinking Lab (DITL), renowned for its extensive expertise in both user experience and service design, aims to gain insights into the prevailing state of design in Taiwan. We conducted interviews with the project implementers to investigate the roles of the designer in the project. Additionally, this study analyzed the experience design cases sourced from The World Experience Organization (WXO) in order to make informed speculations concerning the future development trajectory of the Taiwanese design field, as well as the associated design roles and capabilities.
- The expert interviews—The expert interviews were conducted to gain insights into the perceptions of design held by industry practitioners, along with their prospective predictions. The study entailed interviews with design directors from Taiwan's benchmark industry, as well as Taiwanese designers positioned across the global landscape. To ensure comprehensive coverage of diverse design fields, the selection of interviewees was

intentionally carried out across various industries and organizational categories, encompassing software development, product manufacturing, brand management, consulting firms, and others. It is noteworthy that the participants represent distinguished multinational corporations, including Microsoft, Frog, Indeed, Asus, and BenQ. Moreover, two notable organizations featured among the respondents are 104 Corporation, Taiwan's largest online job bank, and TANG, the most extensive experience consulting service design company in China (see Table 1). The interviews were conducted either in person (offline) or via online platforms. Despite the interviews being conducted in the Chinese language, the selected experts possess a profound global outlook. By comprehending the perspectives of designers working worldwide, this study aims to gain deeper insights into how Taiwanese designers adeptly integrate diverse cultural elements to foster innovation and bring forth new creative energies.

**Table 1.** The catalog of expert interviews.

| Company | Job Title | Code Name |
|---|---|---|
| 104 corporation | Chief Design Officer | P1 |
| Microsoft | Principal Design Manager | P2 |
| X Thinking Institute | Dean | P3 |
| TANG | Experience Strategist | P4 |
| frog | Former executive Design Director | P5 |
| BenQ Corporation | Chief Designer | P6 |
| TANG | Strategy Executive Director | P7 |
| Indeed | UX Designer | P8 |
| ASUS Design Center | Sr. Design Project Manager | P9 |
| HTC Creative Labs | Former User Research Director | P10 |
| Vivo Smartphone | Former general manager, of Hangzhou Design | P11 |
| Alibaba | Alibaba Design University Principal User Experience Architect | P12 |

- Trend Data Analysis—To study the roles of design in the future, this study analyzed the results of future-oriented business reports and professional research trends. This study analyzes 11 reports about the impact of Generation Z and 6 technological trends on design roles and deduces how roles of design and capabilities will be different. This study collected reports on Generation Z from Google, Nielsen, Deloitte, McKinsey, TalkingData, dentsu, etc., extracted the main points of the text, and summarized the analysis framework. On the other hand, this section mines the possible future design roles from the Gartner technology trend report. Gartner is the world's most authoritative IT research and consulting firm in the technology industry and publishes major technology predictions every year. Therefore, this study uses its past trend reports as an analysis context, trying to understand trends' evolution and design's applicability. Taking the Gartner reports as the core, it attempts to deduce possible design capabilities from definitions or example applications.

## RESULTS

After cross-analyzing expert interviews with technology trends and generational transitions, this study produced two main contributions: four prospective stages and twelve future roles for design.

### Four Prospective Stages in the Future of the Design Industry

Based on the results of integrated case studies, expert interviews, and trend research, this study identified 12 design roles spanning four stages of industry transformation from a design perspective (see Figure 1).

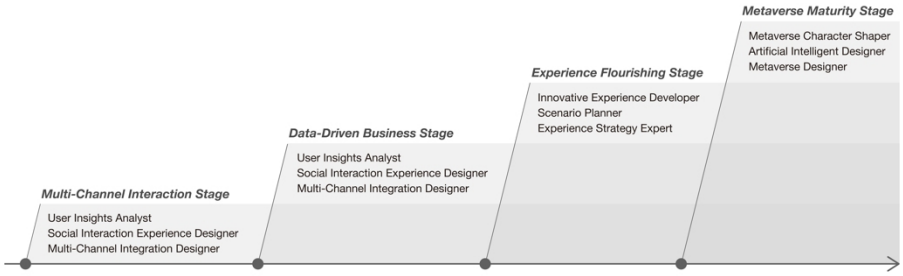


**Figure 1:** Four prospective stages and 12 roles of design.

- Multi-Channel Interaction Stage—This period identifies the design roles required in the context of the booming development of social media platforms and the increasing diversity of virtual and physical channels.
- Data-Driven Business Stage—As society changes and technology matures, cutting-edge technologies will become more prevalent in commercial applications. Modular programming and generative artificial intelligence make interpreting and using data more critical. Industry experts suggest that designers should have the business acumen to have a greater impact in an economy focused on service and experience.
- Experience Flourishing Stage—As the economic system shifts from the early stage of a product-based economy to a service and experience economy, people's satisfaction with a product's functionality alone is no longer sufficient. In recent years, the experience and services provided alongside the product have become the key differentiating factors. Therefore, the abilities of designers will become different to face the challenges of a full-fledged experience economy.
- Metaverse Maturity Stage—Although the metaverse is still nascent, many enterprises have already invested significant resources in this field. Therefore, it can be seen that designers will play a crucial role in the metaverse as it gradually matures. At this stage, artificial intelligence has also become a mature technology, and designers will need to be able to use AI to assist in the design field, which will become a key skill in the future.

## Twelve Potential Design Roles That Could Arise Within Future Industries

These 12 design roles were obtained by cross-comparing the three types of data. The first stage-Multi-Channel Interaction Stage-includes 3 roles (see Table 2). Each of these roles is described in detail below.

**Table 2.** Required competencies for each role in the multi-channel interaction stage.

| Roles | Required Competencies |
|---|---|
| User Insights Analyst | • the ability to segment personas<br>• the ability to grasp unique brand styles<br>• the ability to understand cross-generational preferences and needs<br>• the ability to design cross-generational products |
| Social Interaction Experience Designer | • the ability to social media operations<br>• considering interaction patterns among people<br>• understanding the penetration and dissemination of social media<br>• understanding the sources of brand messages received by Gen Z |
| Multi-Channel Integration Designer | • integrating multiple applications and devices<br>• assisting users in completing tasks anytime, anywhere<br>• using appropriate channels to solve customer problems<br>• integrating the capabilities of software and hardware in a single product |

1. User Insights Analyst—To cater to the rapidly evolving and intricate needs of Generation Z, who form the core consumer group for the future, designers must comprehend the characteristics and distinctions of various segmented groups. Reports indicate that Generation Z seeks individuality, actively utilizes social media to shape distinct social personalities, and exists as a generation that straddles the virtual and physical realms (Francis and Hoefel, 2018). Their consumption behavior serves as a means of self-expression, encompassing brand preferences and corporate values, which also extend their influence to family members from different generations (Dean, Collins and Chen, 2022). Interviewee P9 said that understanding user behavior and thoughts, and skillfully depicting personas is imperative for designers and professionals in other roles alike. In such a complex world where human behavior, environment, and artifacts intersect, a User Insights Analyst can reveal hidden needs, and understand preferences, and motivations, enabling the analysis of intricate personas and influencing consumer behavior across virtual and physical contexts to meet diverse needs and expectations.
2. Social Interaction Experience Designer—Given the indispensable role that social platforms play in Generation Z's lives, there is a pronounced

demand within this demographic for fostering social relationships and engaging with multimedia content. Their consumption motivations encompass the desire to socialize, connect with others, and seek self-pleasure (Dean, Collins, and Chen, 2022). To expand their customer base among Generation Z, brands must acquire a comprehensive understanding of these platforms, recognizing their significance as pivotal consumer touchpoints. Social Interaction Experience Designers assume the vital responsibility of comprehending the intricacies of Generation Z's interaction patterns and devising innovative social interaction modes accordingly.

3. Multi-Channel Integration Designer—Due to the internet and technological advancements, the growing complexity of interaction. To achieve the concept of Anywhere operation, which Gartner's 2021 report introduces, the business model must allow stakeholders to operate from any location (Panetta, 2020). The strategy executive director and the chief designer emphasize the significance of channel construction in brand creation, as it not only enables designers to identify appropriate resources for customers but also enhances development for the integration of software and hardware. Multi-Channel Integration Designers provide a seamless user experience by managing customer journeys in physical spaces, mastering multi-channel devices for remote operations, and strategically applying channels to relevant touchpoints.

The roles in the Data-Driven Business Stage include 3 roles which are described in detail below (see Table 3).

**Table 3.** Required competencies for each role in the data-driven business stage.

| Roles | Required competencies |
|---|---|
| Information Visualization Designer | • the ability to construct process guidance<br>• the ability to distinguish and combine functional modules<br>• the ability to integrate information computation into product operation<br>• the ability to visualize information |
| Data Application Designer | • utilize data<br>• collect and analyse data<br>• assist with digital transformation<br>• interpret data |
| Business Strategy Designer | • the ability to facilitate decision-making<br>• the ability to balance user needs with business strategies<br>• the ability to function as a product manager<br>• the ability to clarify business problems and propose solutions |

4. Information Visualization Designer—The role of designers as intermediaries to render technology and information into user-friendly formats is increasingly crucial. The prevailing trend of democratization empowers

individuals to proficiently leverage technology and professional knowledge without formal training (Panetta, 2020). This endeavor also contributes to bolstering organizations' development capabilities, fostering the application of technology, and propelling industry innovation. Information Visualization Designers, specifically, play a significant role in visualizing extensive data and information, resulting in the creation of exceptional interface guidance and operational experiences. By making platforms and technologies user-friendly, they facilitate seamless operation and usage for users.

5. Data Application Designer—Design experts consistently consider that measuring results is important, so designers should have the ability to analyze data. They believe that incorporating the concepts of AI and data can make the design more interesting. In addition, the design is very subjective, so it is necessary to continuously accumulate data to persuade businesses and make the design more objective. International companies use data science to understand how users discuss products in the market and how competitors perceive their products. In the future, more devices will collect behavioral data and provide feedback to users, further changing their behavior. From a business perspective, grasping behavioral data can develop new products and plan appropriate sales models (Panetta, 2020). Data Application Designers can collect data to understand the market and competitors, understand users through data, use data to support design decisions during the design process, and ultimately use data to prove the effectiveness of design solutions and make the company believe in the benefits of design.
6. Business Strategy Designer—From design experts' perspective, design refers to good decision-making, and designers must be able to provide options for product managers to make decisions. As the essence of design is to clarify the essence of the problem, designers must be able to propose methods to solve problems to assist business decisions. In addition to facing user needs, they must also face the company's strategic needs. A Business Strategy Designer provides options that balance user and business needs during decision-making in a company. They possess both design and business thinking abilities and lead product development during the development cycle.

   The Innovative Experience Developers, Scenario Planners, and Experience Strategy Experts emerge in Experience Flourishing Stage (see Table 4).

7. Innovative Experience Developer—Immersive and interactive experiences that enhance the emotional connection with products or services can create new business opportunities and values for companies. Entertainment with strong emotional immersion, interactive participation, and group identity has become a part of Generation Z's daily lives. Through the use of data storage technology and providing users with a sense of accomplishment, the company gives players a deeper sense of belonging and more modes of cooperation and competition

(Squire, 2022b). In addition, utilizing psychology to create innovative experiences is also a promising area for research and development (Squire, 2022a). Innovative Experience Developers possess deep knowledge of technology or psychology and can develop innovative ways to enhance the immersive and experiential elements of a theme, leaving a lasting impression on consumers and bringing tangible benefits to the company.

**Table 4.** Required competencies for each role in the experience flourishing stage.

| Roles | Required competencies |
|---|---|
| Innovative Experience Developer | • utilizing various technologies to achieve better experiences<br>• designing for all 5 senses<br>• creating experiences through psychology and philosophy<br>• understanding the psychological sensations of consumers experience |
| Scenario Planner | • understanding and applying a broader context<br>• considering how objects in a scene are connected<br>• collaborating with the public for innovation<br>• incorporating designed objects into real-life situations |
| Experience Strategy Expert | • formulating experience strategies and resource allocation<br>• creating unique experiences<br>• applying curation thinking to the real and virtual world<br>• organizing to enhance the connection between business and users |

8. Scenario Planner—The increasing complexity of interconnected products poses challenges in terms of control and usability, underscoring the significance of situational planning within the design process. The Gartner report shows that the integration of artificial intelligence and Internet of Things technology enables products to autonomously carry out tasks (Panetta, 2018). Furthermore, the emergence of human augmentation technology necessitates heightened situational planning expertise (Panetta, 2019). A Scenario Planner specializes in devising plans for product usage and user experience, encompassing the observation, shaping, application, and connection of various scenarios. During the initial stages of product design, meticulous planning can encompass all aspects of usage scenarios and the seamless coordination and integration within the smart ecosystem, ensuring products harmoniously blend into users' lives.
9. Experience Strategy Expert—Following the product and service economy, the consumption trend has transitioned towards the experience economy. Introducing experience strategies into businesses constitutes the initial step towards enhancing competitiveness in this evolving market. Amidst the pandemic, a London-based immersive entertainment

company rescued the company by innovating new experiential modes and garnering fresh customers and business prospects. Experience strategists possess a unique skill set in planning and executing activities, displaying high creativity, and adeptly applying performance thinking across diverse industries, thereby elevating ordinary experiences to extraordinary heights.

The following roles, which could potentially emerge during the Metaverse Maturity Stage, are elaborated in-depth below (see Table 5).

**Table 5.** Required competencies for each role in the metaverse maturity stage.

| Roles | Required competencies |
|---|---|
| Metaverse Character Shaper | • the ability to depict digital characters<br>• the ability to create virtual personal assistants based on brand settings<br>• the ability to introduce virtual characters through different channels<br>• the ability to design metaverse characters based on culture |
| Artificial Intelligent Designer | • the ability to use generative AI to accelerate processes<br>• an understanding of the changes and impacts of AI on humans<br>• the ability to design experiences that integrate with AI<br>• the ability to clarify problems in AI computations through design |
| Metaverse Designer | • coordinating online art exhibitions and stage effects<br>• enhancing experiences and remote interactions<br>• providing consumers with privacy-preserving operating modes<br>• creating virtual environments and unique interactive experiences |

10. Metaverse Character Shaper—As technology continues to advance, user scenarios are progressively shifting towards digital and virtual environments, leading to the creation of characters that facilitate improved user engagement with the virtual world. Virtual Personal Assistants (VPA) exemplify this trend, aiding users in efficiently managing daily tasks, including the prioritization and filtering of crucial email content. The role of the Metaverse Character Shaper lies in understanding consumers' requirements for both functionality and emotion, enabling a flexible application for the design of intelligent tools and virtual characters. This approach enhances people's willingness to embrace technology and optimizes their overall user experience.

11. Artificial Intelligent Designer—As decision intelligence and generative AI develop, designers adopt AI to continuously evaluate and optimize decision-making processes and accelerate their workflow or assist in design iteration (Gartner, n.d.). Design experts suggest that designers should consider the changes AI may bring to the environment and how humans will respond, and understand the new environments and cognitive processes that may emerge. While AI appears to be a dominant force, humans are not static, and AI may not be able to adapt to human changes in real time. Another expert suggests that design can assist AI engineers in defining problem types, and designers need to cultivate the ability to apply AI in the field. The Artificial Intelligent Designer should be able to use design thinking to anticipate and master the impact of AI, use AI to assist in decision-making on the design end, use generative AI to speed up the product development iteration cycle, and also apply AI to the field to improve the user experience.
12. Metaverse Designer—Although current internet technologies and experience devices are not yet sufficient to fully realize the concept, the metaverse has already been widely applied in the entertainment and art industries over the past two years. Some large music events started building a metaverse to allow visitors worldwide to interact with the music festival in a new way. The pioneers develop immersive social music experiences, allowing our artists and their fans to participate in ways they have never before (Shi, 2022). Metaverse Designers not only have design and art-related backgrounds, but also are familiar with various metaverse concepts and technologies, and are good at collaborating with engineering teams to create stunning dreamlike virtual experiences.

This study created a framework for research design impact that incorporates the three elements of innovation: technology, business, and people. This integration involves insights from experts in the design industry, analysis of domestic and foreign design cases, and examination of technological trends. The outcome defines four stages that lie ahead and identifies 12 possible design roles. These insights empower designers to chart their future work and capabilities in more specific directions.

## CONCLUSION

Future work of design is subject to variation, influenced by changes in technology, demographics, and business landscapes. While the core of design remains people-centric, the methods of execution will inevitably evolve, and the tools employed will undergo significant transformations. Designers are not expected to possess all capabilities, but to cultivate their skills strategically.

In order to foster design abilities for future industry development, this study presents clear strategies to address the evolving landscape of design. By characterizing potential stages of future industry development, defining emerging design roles, and describing the skillsets required for these roles,

the study provides valuable educational guidelines for individuals, companies, and government agencies. From a personal standpoint, designers can assess their capabilities and identify the roles they are best suited for. Then, follow the framework of the four stages, anchor their future development direction, and develop learning strategies that align with future trends. From company executives, this study provides valuable insights to facilitate adaptation to upcoming industry trends and refine job descriptions for future job openings. It is understood that not all designers will possess every ability listed in the tables, but all designers can begin their development journey from some of the abilities mentioned. As a reference for designers' growth context, this study encourages a gradual expansion of design abilities and prepares individuals for a diverse future.

## ACKNOWLEDGMENT

The authors extend their heartfelt gratitude to co-workers for their valuable contributions to this study. Additionally, we express our sincere appreciation to the design experts for generously participating in the interview, which greatly enriched this research. Furthermore, the authors would like to acknowledge the Taiwan Design Research Institute for their financial support, which made this research possible.

## REFERENCES

Critical, V. (2016). *The Everything Guide to Generation Z*. [online] Available at: [PDF] katelynpohlmann.com.

Dean, C., Collins, A. and Chen, A. (2022). *Unlocking Gen Z 2022: A Generation of Contradictions*. dentsu.

Dimock, M. (2019). *Defining generations: Where Millennials end and Generation Z begins*. [online] Pew Research Center. Available at: https://www.pewresearch.org/short-reads/2019/01/17/where-millennials-end-and-generation-z-begins/.

Dorsey, J. R. and Villa, D. (2020). *Zconomy : how Gen Z will change the future of business-and what to do about it*. New York, Ny: Harperbusiness.

Et, B. and Ideo (2011). *Human centered design : toolkit ; HCD*. S. L.: Ideo.

Francis, T. and Hoefel, F. (2018). *True Gen': Generation Z and its implications for companies*. McKinsey & Company.

Gartner (2021). *Top Strategic Technology Trends for 2022*. [online] Gartner. Available at: https://www.gartner.com/en/information-technology/insights/top-technology-trends.

Gartner. (n.d.). *Gartner Identifies the Top Strategic Technology Trends for 2022*. [online] Available at: https://www.gartner.com/en/newsroom/press-releases/2021-10-18-gartner-identifies-the-top-strategic-technology-trends-for-2022.

Lai, M., Huang, J. and B Joseph Pine (2022). *X thinking : building better brands in the age of experience*. Shanghai: X Thinking Institute.

Panetta, K. (2018). *Gartner Top 10 Strategic Technology Trends For 2019*. [online] Gartner. Available at: https://www.gartner.com/smarterwithgartner/gartner-top-10-strategic-technology-trends-for-2019.

Panetta, K. (2019). *Gartner Top 10 Strategic Technology Trends for 2020*. [online] www.gartner.com. Available at: https://www.gartner.com/smarterwithgartner/gartner-top-10-strategic-technology-trends-for-2020.

Panetta, K. (2020). *Gartner Top Strategic Technology Trends for 2021*. [online] www.gartner.com. Available at: https://www.gartner.com/smarterwithgartner/gartner-top-strategic-technology-trends-for-2021.

Shi, Y. (2022). *Metaverse Jigsaw Puzzle Series: From 'niche' to 'mass', the community power detonated by virtual concerts*. [online] FINDIT. Available at: https://findit.org.tw/researchPageV2.aspx?pageId=2039 [Accessed 27 Jul. 2023].

Squire, O. (2022a). *Campfires 56 & 57: Trojan Horses And Finding Meaning In Unlikely Places*. [online] WXO. Available at: https://worldxo.org/campfires-56-57-trojan-horses-and-finding-meaning-in-unlikely-places/ [Accessed 27 Jul. 2023].

Squire, O. (2022b). *UNCONTAINED: The Next Evolution In Hyper-Immersive VR Attractions*. [online] WXO. Available at: https://worldxo.org/uncontained-the-next-evolution-in-hyper-immersive-vr-attractions/ [Accessed 27 Jul. 2023].

Tang, H.-H. (n.d.). *Design Information & Thinking Lab*. [online] Design Information & Thinking Lab. Available at: https://www.ditldesign.com/.

WXO. (n.d.). *WXO — World Experience Organization*. [online] Available at: https://worldxo.org/ [Accessed 27 Jul. 2023].