



New Intelligent Information Technology-Assisted Design Innovation Entrepreneurship Course Potential for User Experience Economy in China

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Abstract. Currently, there are a number of experience economy and experience design research in China, but it is lack of user experience economy course for design innovation entrepreneurship education. Moreover, using new intelligent information technology has been more considered for business model innovation, and little attention is paid to the discussion of entrepreneurial process. Furthermore, carefully considered experience design is aiming for promising value proposition resulting in entrepreneurial success in experience economy. There is a need for considering new intelligent information technology for user experience design and economy to entrepreneurship education. Therefore, this paper is focused on exploring the potential aspects, such as a business model architecture and an entrepreneurial process model architecture in terms of design innovation and entrepreneurship, a new intelligent information technology approach architecture for entrepreneurship, and a experience design and economy approach architecture for design innovation entrepreneurship, which have been used for establishing a proposed new intelligent information technology-assisted design innovation entrepreneurship course framework for user experience economy. The proposed framework has a triangle structure with three interactive modules, namely, new intelligent information technology module, entrepreneurial module, and experience economy and design module, which contains all the above investigated aspects.

Keywords: User experience · Experience economy · Experience design · Design innovation · Entrepreneurship education · Creative thinking · Intelligent information technology

1 Introduction

On May 4, 2015, the General Office of the State Council of China issued the “Implementation Opinions on Deepening the Reform of Innovation and Entrepreneurship Education in Colleges and Universities” that includes the promotion of innovative talent training mechanism and the improvement of the curriculum of innovation and entrepreneurship education [1]. It requires colleges and universities to establish interdisciplinary courses to explore a new mechanisms for cross-disciplinary, and interdisciplinary training of innovative and entrepreneurial talents, and also to promote the transformation of talent cultivation from a single discipline to a multi-disciplinary integration. In response to the opinions of the General Office of the State Council of China, on March 29, 2018, the General Office of the Ministry of Education of China announced the “Notice on Excellence in Deepening the Construction of Reform and Entrepreneurship Education Model Universities in 2018” [2]. The notice calls for the full use of modern information technology to accelerate the construction of innovative entrepreneurship education courses.

Recently, KPMG, the world’s leading accounting firm, surveyed nearly 800 technology industry executives and released the 2018 Global Technology Innovation Report [3]. The report points out that the world is currently in an era of technological innovation, which the Internet of Things (IoT), artificial intelligence (AI) and robots will inevitably affect global businesses, where the enterprises that do not take the initiative to seize future trends will be eliminated. Global technology leaders believe that revenue growth has replaced patents and has become the primary indicator for measuring the success of a company’s technological innovation. Patents have fallen out of the top three, with market share and return on investment ranked second and third. Meanwhile, they believe that the role of the Chief Information Officer is responsible for promoting innovation within the company rather than the Chief Innovation Officer. However, Chinese respondents most often talk about chief innovation officers.

The collaboration between the key elements of the new intelligent information technology, such as IoT, data analysis, and AI, will create a huge network of intelligent machines in the world, enabling massive business transactions without human intervention. The data they create and share will bring a new information revolution to human work and life. People will be able to use the information from the IoT to deepen their understanding of the world and their lives, and make more appropriate decisions to achieve the best user experience and its economy. The experience economy is based on a developed service economy. In the era of information technology, it is gradually and even large-scale, and called, the fourth stage of economic development after the agricultural economy, industrial economy and service economy stage, or the extension of the service economy. Good product design often means better entrepreneur business performance, especially as the boundaries between hardware, software and services become increasingly blurred.

Lately, McKinsey, the world’s leading consulting company, spent five years tracking the design behavior of 300 listed companies in different countries and in different fields, and released a report on the Business Value of Design [4]. The report emphasizes that design requires cross-industry capabilities that break the boundaries

between physical, digital, and service design. At the same time, the design is not only about the product, it is an experience.

Therefore, the aim of this paper is to explore the potential of establishing cross-disciplinary, and interdisciplinary design innovation and entrepreneurship education course for achieving user experience economy by implementing new intelligent information technology.

2 Innovation and Entrepreneurship Education

Innovation is building a new production function. Entrepreneurship is essentially establishing a new production function plus a new organization, that is, innovation plus the establishment of a new organization [5]. Innovation education and entrepreneurship education are interlinked in essence. Innovation is the foundation of entrepreneurship. Entrepreneurship is the carrier and realization form of innovation. Usually, the success or failure of a startup depends on the degree of innovation. From the perspective of the relationship between innovation education and entrepreneurship education, the two have the same goal orientation, which aims to cultivate students' innovative spirit and practical ability. The two functions are of the same effect. Entrepreneurship education integrates innovation education into the requirements of entrepreneurship quality. Innovation education focuses on the overall grasp of human development, while entrepreneurship education focuses on how to realize people's self-value [6]. For example, in the United States, innovation education emphasizes that schools should pay more attention to the development of students' individuality, originality and innovation ability while cultivating their comprehensive development [7]. In the UK, under the model of tutorial system, innovation education attaches great importance to cultivating students' self-learning ability, hands-on ability and innovation ability. And that's exactly what entrepreneurs need to start a business.

China's innovation and entrepreneurship education originated from the wave of reform and opening up in the late 1970s. There are eight characteristics of innovation and entrepreneurship education [8]: (1) The government attaches great importance to it; (2) The beginning of the series of courses; (3) The teaching methods are becoming more and more perfect; (4) Some schools have set up special innovation and entrepreneurship teaching projects; (5) Teaching materials Construction has begun to take shape and scale; (6) Under the impetus of the Ministry of Education, many schools have a strong planning and innovation in entrepreneurship education; (7) Many schools have established practical teaching institutions for innovation and entrepreneurship; and (8) Focus Academic research supports the system and depth of innovation and entrepreneurship teaching.

There are also some shortcomings in innovation and entrepreneurship education in China, such as: (1) Marginalization of the discipline status of innovation and entrepreneurship education; (2) Lack of practical teaching in teaching methods; (3) Teaching objects vary from school to school; (4) Teaching content varies from teacher to teacher; (5) Academic research on innovation and entrepreneurship supporting teaching needs to be systematic and deepened; and (6) The degree of curriculum system needs to be improved.

Hence, educators should pay attention to their characteristics and weaknesses when carrying out innovation and entrepreneurship education. At the same time, they should have a detailed understanding of the key factors of innovation and entrepreneurship, i.e. business model and entrepreneurship process.

2.1 Business Model

In order to create new markets and wealth, entrepreneurs first need to consider the innovation of a whole business concept or business model that is a framework for figuring out how to start a company, sell a product, and make a profit [9]. Instead of tweaking existing business models, entrepreneurs create entirely new ones in unconventional ways.

The term business model first appeared in the computer science journal of the 1970s and was used to describe the relationship and structure between data and processes [10], which originally came from the widespread use of spreadsheet software that allows planners to easily modify parameters based on different assumptions to produce different plans [11]. After the rise of e-commerce, a large number of new companies have used their business in different ways in the past, and widely used the term business model in order to distinguish them from traditional operations [11]. However, there is no uniform definition of business model in academia. It can be:

- Operational innovation [12]. It involves using an entirely new operational approach to complete tasks, develop products, provide customer service, or complete other operational activities;
- An activity undertaken to help customers create value [11]. It is the enterprise structure and its partner network formed by enterprises for value creation, value marketing and value provision, so as to generate profitable customer relationship capital that can maintain income flow [13]; and
- The mixture of value streams, revenue streams, and logistics [14]. Business model is the focus of enterprise innovation and the decisive source of value created by enterprises for themselves, suppliers, partners and customers.

In addition, the structural dimension is an endogenous variable of the business model, reflecting the intrinsic characteristics of the business model, which has following eight issues [15]:

Value Proposition. A value proposition is a statement of what the company is addressing for its customers. What kind of value does the company want to offer its customers? With the different value positioning among manufacturers, the activities of manufacturers will also have different differences. Through the design and implementation of all activities of manufacturers, manufacturers will transfer their value proposition to customers and create value for manufacturers and individuals.

Core Strategy. A core strategy is one in which a firm decides how to transform its assets and resources into meaningful value for customers.

Resource Allocation. It refers to the arrangement made by a manufacturer for its assets, resources and processes in order to realize its claim of providing value to customers.

Organizational Design. It refers to the work that a manufacturer may adjust its organizational structure to suit its resource allocation and core strategy.

Value Network. When the manufacturer decides that some operational activities need to be outsourced, it can create value for customers through external business partners.

Product and Service Design. No matter how the manufacturer defines its value proposition, what consumers can feel is the products and services provided by the manufacturer. Therefore, product and service design is very important. The manufacturer shall ensure that its products and services are consistent with its value proposition, and even the supporting measures of the whole product and service shall be consistent with its value proposition. The feeling of consistency will improve customers' perception of the value of products or services, while ignoring any link will result in the loss of the value provided by manufacturers to customers.

Business Revenue Mechanism. The design of a manufacturer's business revenue mechanism determines how fees and charges are charged to customers.

Profit Potential. The purpose of business model innovation is to help manufacturers gain wealth, so profit potential is the most critical factor in business model design.

Further, a business model should have four main elements [16]: (1) the value proposition. A business model describes what value an enterprise provides to its customers and business partners; (2) product or service. Products and services determined by value proposition will link the manufacturer and the customer. They must meet the company's commitment to customer benefits; (3) value architecture. It includes three modules: market design, internal architecture and external value architecture; and (4) revenue model. Revenue model to explain how the firm gets her earnings. They can have different sources of profit sources of revenues. When these sources combine, they form a revenue model for the firm.

Business models emphasize value creation. It is an activity to create new value in order to bypass competitors [17]. Business model innovation is an extension of the product, which requires entrepreneurs to dramatically increase existing strategic changes and create thousands of new ideas that allow us to find new themes and directions [9].

In terms of business model innovation, product design should consider following aspects [17]: (1) performance and support, which means how the company contacts customers, what channels it uses, what forms of customer support it provides, and what level of service it provides; (2) information and insight, which refers to the information obtained by the company from customers and the ability to gain insight into information, through which the company can provide customers with unique value; and (3) relationship dynamics, which refers to how the company interacts with customers and through which indicates what kind of customer loyalty the company can cultivate. Moreover, products and services are used for connecting manufacturers with customers. This is determined by value proposition and the company must satisfy the

commitment to the customer. When deciding what to offer to satisfy the customer, it also determines what the company should do. The customer interface includes vendor-to-customer, customer-to-vendor, and among customers, which is often with distribution channels and information that the company use to create value for customers [16]. Furthermore, when conducting product design, entrepreneur must consider the following issues [18]: the interests of stakeholders that the company must meet or influence; the benefits and disadvantages of the commodities provided to all stakeholders; capturing the timing of the firm’s impact on stakeholders; and Identifying where the company is delivering value. As such, in terms of business model innovation, it is important to consider what kind of customer relationships can be promoted through product and service design activities, and how should vendors apply these relationships [15]? This requires thinking about the impact of product and service design on stakeholders, when and where they are provided. What are the products and what information they can get? This kind of thinking can enable the company to better use this information and create more value for customers. However, creating value for customers does not mean that the company can make profits. Profits can only be determined by the game among suppliers, customers, competitors, substitutes and complements. In order to determine the profit of a company, it is necessary to consider specific resources, resource scarcity, resource substitution, resource imitability, capability unpredictability, network externality, time difficulty, the use of strategy against imitation and the integration of related resources [19].

Therefore, as shown in Fig. 1, in terms of design innovation and entrepreneurship, business model is defined as: taking value proposition as the design goal and forming revenue model with profit potential as the entrepreneurial goal through value architecture design taking product and service design activities as the starting point.

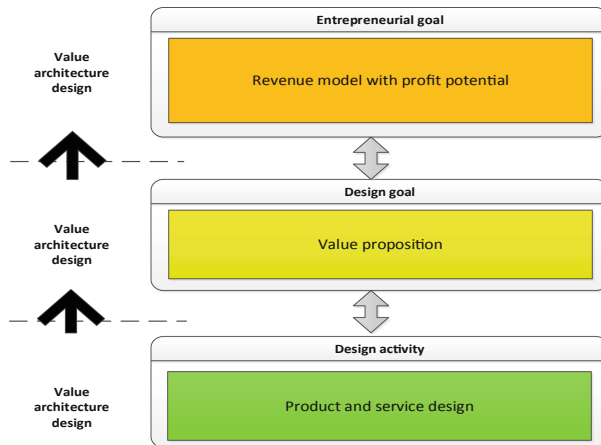


Fig. 1. The business model architecture in terms of design innovation and entrepreneurship (devised by the authors based on the literature).

2.2 Entrepreneurship Process

Entrepreneurship is a complex phenomenon across multiple disciplines. Different disciplines, including economics, psychology, sociology, anthropology and management, observe and study entrepreneurship from their unique research perspectives by using concepts and relevant terms in this field [20]. The entrepreneurial process involves all the events in the process of making a business plan into a real business organization [21]. However, the entrepreneurial process is not only the creation of an organization, but also the process of grasping opportunities, that is, opportunity is the core issue of entrepreneurial research, and the entrepreneurial process is a series of processes centering on the identification, development and utilization of opportunities [22]. Further, the entrepreneurial process is more of a rational, nonlinear and repeatedly revised practical process, including initial opportunity identification, product line construction, organization creation, market transactions and customer feedback [23].

The entrepreneurial process is a dynamic and complex process that needs to be presented in the form of a theoretical model of the entrepreneurial process, which has been recognized in following three types of theoretical models [24]: a linear model of enterprise growth based on the new product development process, a linear model of complex enterprise growth aiming at the staged success of the enterprise, and a dynamic adjustment dominated by the most important driving factors of the model.

A Linear Model of Enterprise Growth Based on the New Product Development Process. It has five stages [25]. The first stage is the Proof-of-principle Stage. In this stage, new organizations have not appeared yet, and the main task of entrepreneurs is to verify the feasibility of innovative technologies. In the second stage, the Prototype Stage, the product has been produced and the organizational structure has also formed its prototype. The third stage is the Model-shop Stage, in which mainly tests the market response of products to improve the feasibility of products. The scale of the organization has been expanded, the necessary professional division of labor has emerged, and the necessary business activities such as finance and marketing have begun to appear. In the fourth stage, the Start-up Stage, the start-up enterprises have entered a mature development stage, the profitability of the products is further improved, and the second generation of products begin to appear. As the organization expands further, more management problems emerge, which requires entrepreneurs to put more energy into it. The fifth stage is Natural Growth, when the organization enters the stage of Natural Growth and expansion. The growth rate is much lower than the start-up stage, and is more determined by the growth rate of the industry. Entrepreneurs start thinking about new strategic changes, holding on to existing market share, or entering a new start-up cycle.

A Linear Model of Complex Enterprise Growth Aiming at the Staged Success of the Enterprise. It consists of five stages [26]. Stage 1: Existence. The main objective of the entrepreneur is to form a business opportunity. At this time, the organizational structure is simple, and the entrepreneur must deal with almost all the affairs. Stage 2: Survival. The goal of investors and entrepreneurial teams is how to make the enterprise larger and enter the next stage. Otherwise, they can only continue to stay in the survival period. If the stagnation period is too long, the cash flow of the enterprise may dry up

and the enterprise may go bankrupt. Stage 3: Success. The enterprise has obtained a good income and its organizational scale has begun to take shape. At this time, there may be differences between investors and managers of the enterprise, and some investors hope to withdraw their investment at this time. Another challenge for enterprises at this stage is whether they can timely adjust their strategies in the face of external changes. If they cannot make adjustments smoothly, their development is likely to go backwards. Stage 4: Take-over. The enterprise maintains rapid growth and its organizational function has been quite perfect. At this time, investors begin to look for opportunities to sell the enterprise. Voluntary or involuntary management changes may occur in the enterprise restructuring, which may have a great impact on the operation of the enterprise and even may reverse the development of the enterprise. Stage 5: Resource Maturity: enterprises have obtained enough resources to support the operation of enterprises and achieve economies of scale. However, at this time, enterprises are likely to fall into the misunderstanding of traditional large enterprises, such as lose initiative, be satisfied with the status quo, and be eager to avoid risks, until the market environment changes significantly and forced to change.

A Dynamic Adjustment Dominated by the Most Important Driving Factors of the Model. Entrepreneurial process is a highly dynamic process, in which business opportunities, resources and entrepreneurial team are the most important driving factors [27]. Business opportunity is the core element of the entrepreneurial process. Resources are necessary support for the entrepreneurial process. In order to rationally use and control resources, entrepreneurs often have to try their best to design a delicate and prudent strategy for entrepreneurship, which is often extremely important for new enterprises. Entrepreneurial team is a key component of a new enterprise. The basic qualities necessary for entrepreneurial leaders and entrepreneurial teams are: strong learning ability, ability to deal with adversity freely, integrity, reliability, honest quality, determination, perseverance and creativity, leadership, and communication skills. The model features three core elements forming an inverted triangle with the entrepreneurial team at the bottom of the triangle. In the initial stage of entrepreneurship, the triangle will be inclined to the left due to the large business opportunities and the lack of resources. With the development of enterprises, enterprises will have more resources, but then the original business opportunities may become relatively limited, which leads to another imbalance. Entrepreneurial leaders and teams need to constantly explore greater business opportunities and make rational use of resources to maintain a proper balance in the development of enterprises. It is the actual process of the development of the new enterprise to adjust the three constantly and realize the dynamic equilibrium.

Therefore, as shown in Fig. 2, for design innovation and entrepreneurship, the entrepreneurial process is a the dynamic process to grasp business opportunities, resources, entrepreneurial team advantages, through the new product and service development process, to achieve success of each stage of the enterprise development.

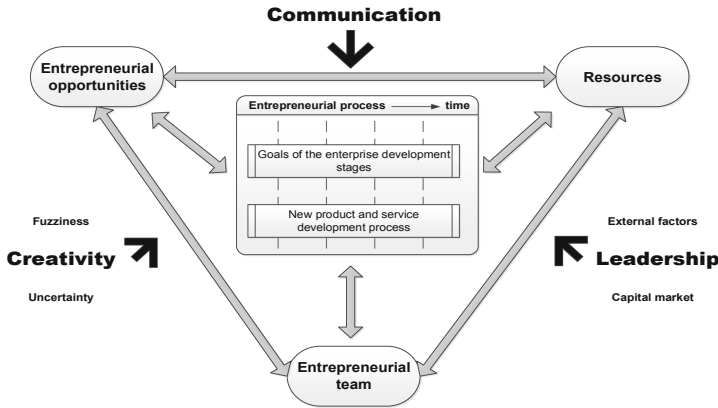


Fig. 2. The entrepreneurial process model architecture in terms of design innovation and entrepreneurship (devised by the authors based on the literature).

3 New Intelligent Information Technology Potential for Entrepreneurship

Intelligent information technology is jointly constructed by information technology and intelligent theory [28]. Information technology is a multi-level, multi-disciplinary integrated technology, which refers to the whole of sensing technology, communication technology, intelligent technology (including computer hardware, software, and AI, artificial neural networks) and control technology. Among them, sensing technology includes sensor technology and measurement technology, such as remote sensing and telemetry technology, which are technologies that enable people to better obtain useful information from the outside world. Communication technology is the technology that transmits information. Intelligent technologies, including computer hardware technology, software technology, artificial intelligence technology and artificial neural networks, can better process and reproduce information. The control technology can intervene the movement state and mode of external things according to the input instruction information (decision information), that is, the technology that utilizes information. The theory of intelligence is a science to explore the mysteries and laws of human intelligence and to reproduce human intelligence in machines. It is the frontier of modern scientific research. At present, the theory and technology of intelligence are mainly in two aspects, of which one is the direct research on the generation, formation and working mechanism of intelligence; the other is to study how to simulate, extend and expand intelligence with artificial methods and how to improve the intelligence level of machines, especially computers, so that machines can become intelligent machine systems with perception, reasoning and decision-making.

With the proliferation of emerging online and web-centric technologies, the intelligent information technologies are gaining increasing attention, and these technologies are designed to make it relatively easy for users to perform complex tasks in fields such as information systems, intelligent agents, AI, and web engineering [29]. In addition, emerging emerging intelligent information technologies, such as the internet plus,

Internet of Things, blockchain, and big data and their analytics, bring new vitality and direction to intelligent information technology. Hence, Fig. 3 summarizes an approach architecture of new intelligent information technology for entrepreneurship potential, which has three levels, namely, intelligence theory, information technology, and entrepreneurship. However, at present, for these new intelligent information technology entrepreneurship researches in China, the focus is on the discussion of business model innovation, and little attention is paid to the discussion of entrepreneurial process.

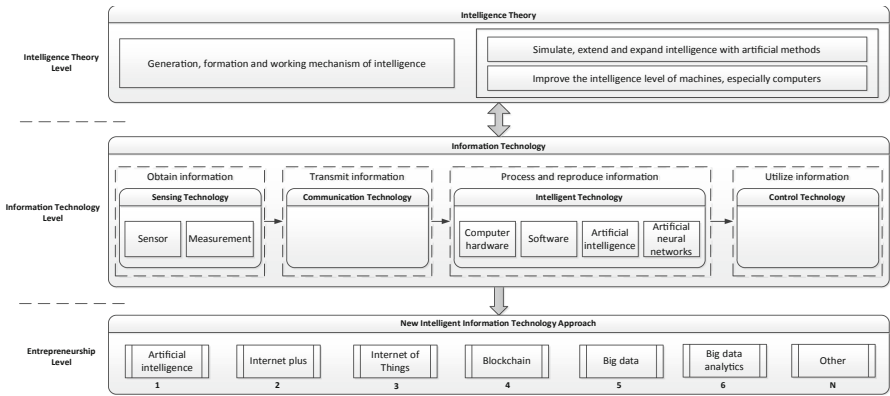


Fig. 3. New intelligent information technology approach architecture for entrepreneurship potential (devised by the authors based on the literature).

4 The Experience Economy

Throughout the history of the development of human society, human society has evolved from the product economy era to the service economy era, and now to the experience economy era [30]. As an extension of service economy, experience economy is the fourth type of economy after agricultural economy, industrial economy and service economy, which emphasizes the sensory satisfaction of customers and attaches importance to the psychological experience of customers when consumer behavior occurs [31]. Experience economy is different from agricultural economy, industrial economy and service economy in terms of production behavior and consumption behavior [32]:

Agricultural economy: the production behavior is based on the production of raw materials; Consumer behavior is based solely on self-sufficiency.

Industrial economy: the production behavior is based on goods manufacturing; Consumer behavior emphasizes functionality and efficiency.

Service economy: emphasize division of labor and product function in production behavior; Consumer behavior is service-oriented.

Experience economy: the production behavior is led by the improvement of service, and the goods are used as props; Consumer behavior pursues the appeal of sensibility and situation, creates activities worth recalling by consumers, and pays attention to the interaction with goods.

The traditional economy mainly focuses on the powerful functions, beautiful appearance and price concessions. The current trend is to shape the sensory experience and thinking identity from the perspective of life and situation, so as to capture the attention of consumers, change consumer behavior, serve as products, and find new survival values and spaces. That is to say, the company focuses on service, and uses goods as the material to create a memoryworthy feeling for consumers to be economically successful.

4.1 Experience Design

Before a company gets revenue, it must design an experience that customers consider value for money. Excellent design, marketing and delivery are as important to the experience as they are to goods and services. Design and innovation will always lead the way in revenue growth. The experience, like goods and services, has its own unique qualities and characteristics, and presents its own unique design challenges. As shown in Fig. 4, The experience for design and innovation has two dimensions [31]: (1) customer participation. At one end of this dimension is passive participation, and the customer does not affect performance at all. At the other extreme is active participation, where customers play a key role in creating performance or generating experiences; and (2) connection, or environmental relationship. This dimension describes the connection of a customer to an activity or performance, that is, one end is absorption and the other end is immersion. In addition, corresponding to these two dimensions, the experience can have a broader four realms, namely, entertainment, Educational, Escapist, and esthetic.

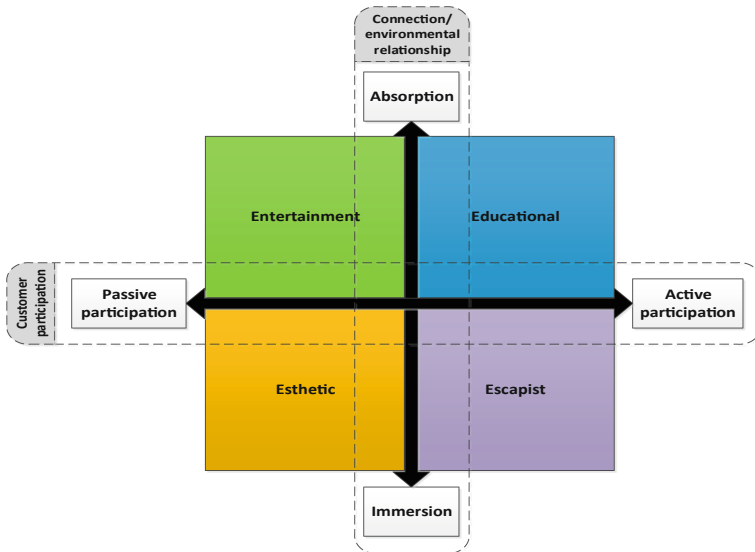


Fig. 4. The characteristics of experiences for design and innovation: two dimensions and four realms (devised by the authors based on the literature).

Further, experience design has become a commercial art like today's product design and process design, with five key experience design principles:

- (1) Theme the experience;
- (2) Harmonize impressions with positive cues. Although the theme is the foundation, experience must be presented in an indelible impression. The impression is the "takeaway" of experience, which is used to help complete the theme. In order to leave the impression customers want, the company must give the guest some cues to confirm the nature of the experience. Each cue must support the topic, and any clues should not be inconsistent with the topic;
- (3) Eliminate negative cues. Ensuring the integrity of the customer experience requires more than just positive cues. At the same time, it is necessary to eliminate any weakening, contradictory or decentralized subject matter;
- (4) Mix in memorabilia. People buy certain goods, mainly for the memories they convey; and
- (5) Engage all five senses. Accompanied by a sensory stimulus from experience should support and strengthen its theme. The more senses involved in an experience, the more effective and memorable it is.

However, the use of these five design principles is not a guarantee of success, but also need to consider the law of supply and demand. If companies fail to provide a consistently engaging experience, overprice the value of the experience, or overpay for it, they will certainly face pressure from demand, pricing, or both. Design is an important means for enterprises to adapt to the new trend of social, economic and technological development and meet the new needs of consumers. As a new design concept emerging in the era of experience economy, experience design marks that design has entered a new stage of humanization from standardization and customization, and that design has evolved from product as the core to consumer experience as the core, and from paying attention to the function and economy of things to providing consumers with delightful experience.

Therefore, as indicated in Fig. 5, for design innovation entrepreneurship, the contribution that experience design and economy can offer is to center on the dimension of design services for business services guided by entrepreneurial economic factors, throughout the entire process of commodities, goods, services, and experiences (i.e. extract, make, deliver, and stage), while referring to the five key principles, and two dimensions and four realms of experience design (refer to Fig. 4), to realize the economic value of innovation and entrepreneurship.

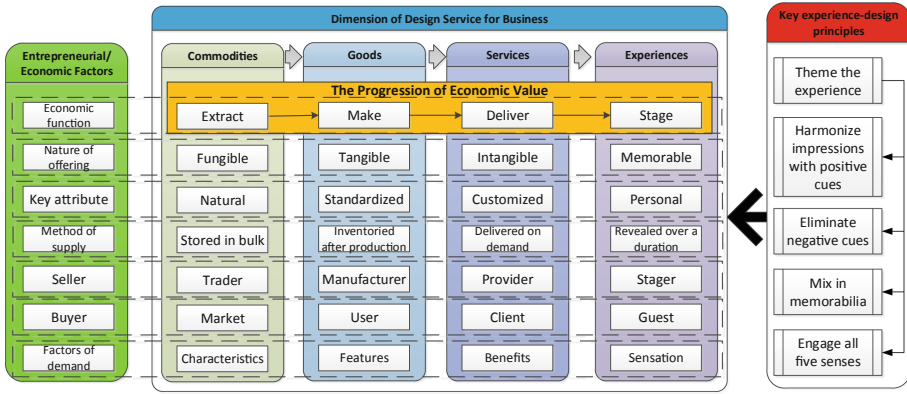


Fig. 5. The experience design and economy approach architecture for design innovation entrepreneurship potential (devised by the authors based on the literature).

4.2 Current Experience Economy and Experience Design Research in China

At present, as the economy grows, there is a boom in experience economy and experience design in China. As shown in Table 1, research on experience economy and experience design covers a number of design-related fields, as well as its related categories and subjects. Design-related fields mainly focus on spatial design, visual communication and product and industrial design. In addition, they also cover fashion design, emotional design and creative culture industry design, interaction experience design, game design, public art design and design management. Spatial design focuses on public space, including commercial and non-profit public spaces, and the discussion of related categories and subjects. The design categories related to the company’s branding are the focus of visual communication, including brand website, brand strategy, brand advertising, and brand visual identity. Interestingly, the experience economy and experience design associated with the tourism industry covers many design-related fields, categories and topics.

4.3 Current User Experience Economy Course for Design Education in China

The era of experience economy is coming, and the design education about experience economy and experience design in China is gradually emerging. Unlike the research and applications mentioned above, which have covered a number of aspects of design, the current research on design education of experience economy and experience design in China involves several fields, such as space design [33], visual communication design [34], industrial design [35, 36], and clothing design [37]. Among them, there are only three design courses that respectively cover topics on commercial building interior design [33], industrial design [35], and garment design [37].

5 Discussion and Conclusion

The modern society based on information technology has led to fundamental changes in people's life style. Information culture has swept the whole world and stepped into the era of experience economy. In the era of experience economy, with the continuous innovation of information technology and the development of network, the product is no longer the only important link in the business process [38]. Since the service is mainly a kind of experience, designer needs to consider people's spiritual experience and pay attention to the high-level demand of people's self-realization. To meet personalized needs, designer is required to not only focus on innovating products, but also realize innovative services through design, so as to bring better services to consumers, realize business value and achieve entrepreneurial success. The designer's responsibility shifts from designing good products to achieving better services and experiences through design, satisfying the value propositions of enterprises, consumers and stakeholders, and obtaining commercial benefits. The original concept of design education has been unable to meet the social demand for design talents and such entrepreneurship [39]. From the day of its birth, the design discipline is an interdisciplinary subject of various disciplines such as art, psychology, materials science, aesthetics, literature, engineering, and sociology. With the development of social economy, it continues to absorb more disciplines. Innovation and scientific and technological achievements have led to design innovation that has led to the emergence of design thinking, technological innovation, and business model innovation.

However, currently, there are a number of experience economy and experience design research in China, but it is lack of user experience economy course for design innovation entrepreneurship education. moreover, using new intelligent information technology has been more considered for business model innovation, and little attention is paid to the discussion of entrepreneurial process. Furthermore, carefully considered experience design is aiming for promising value proposition resulting in entrepreneurial success in experience economy. There is a need for considering new intelligent information technology for user experience design and economy to entrepreneurship education. Therefore, this paper is focused on exploring the potential aspects, such as a business model architecture and an entrepreneurial process model architecture in terms of design innovation and entrepreneurship, a new intelligent information technology approach architecture for entrepreneurship, and a experience design and economy approach architecture for design innovation entrepreneurship, which have been used for establishing a proposed new intelligent information technology-assisted design innovation entrepreneurship course framework for user experience economy, as shown in Fig. 6. The framework has a triangle structure with three interactive modules, namely, new intelligent information technology module, entrepreneurial module, and experience economy and design module, which contains all the above investigated aspects. Further research will focus on the creation and demonstration of the course content.

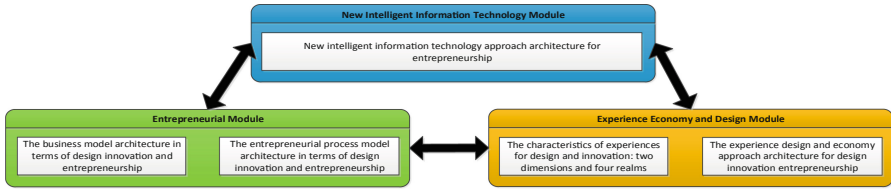


Fig. 6. A proposed new intelligent information technology-assisted design innovation entrepreneurship course framework for user experience economy (devised by the authors).

Table 1. Current experience economy and experience design research in China (devised by the authors based on the literature).

Design-related fields	Design-related category	Design related subject
Interaction experience design	Digital interaction	
Product and industrial design	Industrial product	
	Toy design	
	Ceramic product design	
	Furniture design	
	Campus cultural products	
	Design aesthetic	
	Tourism products	The hotel product Tourist souvenir Catering products
Emotional design	Product design	
	Packaging design	
	Vegetable market design	
Spatial design	Architectural design	
	Landscape design	
	Interior design	
	Commercial public space	The mall Restaurant Theater Urban commercial complex planning
	Non-profit public space	Public environment facility Historical and cultural district Museum
	Exhibition Design	Science and technology museum Traditional furniture
	Fashion design	Experiential clothing
Experiential design		
Clothing brand new retail		

(continued)

Table 1. (continued)

Design-related fields	Design-related category	Design related subject
Visual communication	Interface design	
	Brand website	
	Brand strategy	
	Brand advertising	
	Brand visual identity	
	Visual culture	
	Packaging design	
	Book design	
	Tourism information communication	Scenic guidance system Travel Information
Game design	Digital game	
Public art design	Sculpture	
Design management	Design management process	
Creative culture industry design	The film and television	
	Tourism industry	Film and television tourism Sports and leisure
		Marketing

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