Design Psychology In Human-Computer Interaction Design

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Abstract- *In this era of rapid development, product design not only has to meet some mechanical and practical needs, but also must meet people's emotional and psychological design needs. In the past, the normal the human-computer interaction interface cannot meet the wants of people for human-computer interaction interface within the current era, so it's necessary to integrate some psychological design content. Therefore, so as to enhance the user's experience of human-computer interaction interface, this paper puts forward the research method of the human-computer interaction interface design supported design psychology.*

Keywords- Design Psychology, User Interface Design, Human-Computer Interaction, User Experience Design

I. INTRODUCTION

Design Psychology: Design psychology is a discipline of human psychological needs through the role of consciousness in design. Explore the psychological reaction of designers in the process of creation and explore society. For example, people's psychological reaction in creative practice is a continuous improvement method in design science. It promotes the continuous improvement of design theory and makes it reflect and meet people's psychological needs.

Human Computer Interaction: Human computer interaction (HCI) is a subject that makes computer-based systems most easily used by human beings through design and evaluation. It is a science that studies the design, evaluation and implementation of interactive computing systems and related phenomena. Human computer interaction is a comprehensive science, involving computer science, psychology, sociology, industrial design and graphic design. Human computer interaction interface, also known as user interface, refers to the way and method of human and product interaction.

Interactive design method of the self-service terminal interface supported user cognitive ability. during this method, designers must study the users first, determine the user groups that require to be troubled, so analyze the cognitive ability, establish the user cognitive load model, describe the user interaction behavior, determine the fundamental interaction framework, and so use the overall usability design model to ascertain the interaction design matrix and propose the interaction design scheme.

Based on design psychology, so as to address the impact of the new era on the development of human-computer interaction interface design of design psychology. This paper puts forward the research method of human-computer interaction interface design supported design psychology. On some related problems of psychology, this paper analyzes some practical problems in the design of human-computer interaction interface supported design psychology from the aspects of human activity and perception, and plans consistent with the overall design rules of design psychology, so on formulate a collection of suitable for the new era This paper presents a replacement project of human-computer interface design supported design psychology. Through the analysis, the research method proposed during this paper provides a new development idea for the research of human-computer interaction interface design supported design psychology.
This paper reviews the idea of self-efficacy and also the existing display design principles. Then, by improving the user's self-efficacy, the paper puts forward suggestions for improving the computer program design, and evaluates the changes of user's feelings within the process of interaction. within the design of human-computer interaction interface, scholars have considered user experience, but it's not too deep.Therefore, supported design psychology, this paper focuses on the appliance of user experience in human-computer interaction interface design.

II. LITERATURE SURVEY

Design psychology began to rise within the 1940s. Its original goal was ergonomics, but it absolutely was limited to war. Now, of course, the scope is extremely narrow. Therefore, from the 1960s to the 1990s, design psychology has been more and more accepted by the general public, and has been widely utilized in general design, and gradually developed into design psychology with modern significance. The theoretical basis of design psychology mostly comes from

related disciplines, which is an interdisciplinary subject. People gradually found the relationship between its research content and lots of psychological schools. Only when they are combined organically can design psychology become a professional and systematic tool discipline.

Initially, users are striving for higher, faster and safer computers. However, with the event of information technology and also the popularization of an information application system, users are committed to seeking more suitable, easy-to-use and satisfactory computers. They hope that within the process of communicating with computers, they're going to gradually understand the wants, hobbies and degrees of users, and also the knowledge of users will develop together with computers. the development of the technology level and application effect of this sort of man-machineintelligence cooperation is a very important sign that computer and computing technology has entered a brand-new stage. In the era of computer centered electronic products, human-computer interaction technology has become one in all the national research hotspots.

III. WRITEDOWNYOUR STUDIESANDFINDINGS

From the angle of design psychology, the occurrence of human consumption behavior is caused by three factors: demand, motivation and behavior, among which demand leads to the engine so dominates the behavior. Demand may be a group's desire for a specific goal, and also the foremost fundamental reason sure behavior. Therefore, when exploring the research methods of human-computer interaction interface design supported design psychology, we should first grasp the wants of consumers.

Because some consumer groups have common goals and needs, design psychology divides different individuals into the same group in keeping with the identical needs. so as to style excellent human-machine interface design products supported design psychology, it's necessary to conduct research on the market of faculties and universities within the early stage. The main object of study is that the vast number of school consumer groups. consistent with the particular situation, this paper first classifies the buyer groups, and so in step with the classification results, makes a close and in-depth analysis of different consumer groups within the style of a questionnaire, so as to grasp the buyer market more accurately and comprehensively.

Here comes the most crucial step for your researchpublication.Ensurethedraftedjournaliscriticallyreviewedbyyour peers or any subject matter experts. Always try to get maximum review comments even if you are well confident about your paper.

Understanding what users go through, starts with user research. When conducting user research, we should always completely detach our personal feelings and immerse ourselves within the research process. we should always empathize with the human and emotive parts of the method and dig deeper into understanding users' behaviors, limitations, motivations, and goals. Effective communication is important at this stage. we must always ask questions that help us clearly understand users' needs and their mental models of design systems. By doing these, we follow a human-centered design approach to form solutions that empower the users.

Visual elements evoke certain feelings in users. An understanding of psychological principles of design can influence how users receive information. it's necessary to understand a way to synthesize information that permits users to possess a seamless experience and avoid information overload. Design principles are applied in UX design to assist guide design decisions and help designers explain the meaning behind every decision. Understanding psychological design principles will facilitate you discover what goes into creating intuitive and relevant user experiences.

Hick's Law predicts that the time it takes to make a decision increase with the number and complexity of choices available. It was formulated by psychologists William Edmund Hick and Ray Hyman in 1952 after examining the relationship between the number of stimuli present and an individual's reaction time to any given stimulus.

Cognitive load refers to the mental processing power being used by our working memory. Our brains are similar to computer processors in that we have limited processing power: when the amount of information coming in exceeds the space available, cognitive load is incurred. Our performance suffers and tasks become more difficult, which results in missed details and even frustration.

Miller's Law, which predicts that the average person can only keep 7 (± 2) items in their working memory. It originates from a paper published in 1956 by cognitive psychologist George Miller, who discussed the limits of short-term memory and memory span. Unfortunately there has been a lot of misinterpretation regarding this heuristic over the years, and it's led to the "magical number seven" being used to justify unnecessary limitations (for example, limiting interface menus to no more than seven items).

Jakob's Law which states that users spend most of their time on other sites, and they prefer your site to work the same way as all the other sites they already know. In 2000, it was put forth by usability expert Jakob Nielsen, who described the tendency for users to develop an expectation of design patterns based on their cumulative experience from other websites. This principle encourages designers to follow common design patterns in order to avoid confusing users, which can result in higher cognitive load.

A **mental model** is what we think we know about a system, especially about how it works. Whether it's a website or a car, we form models of how a system works, and then we apply that model to new situations where the system is similar. In other words, we use knowledge we already have from past experiences when interacting with something new.

IV. APPLICATIONS

Multi Purpose Water Dispenser

In this particular model installed at the California Academy of Sciences, you can just drink or fill a bottle.

The Anti-Pee Wall

The great solution for a problem that originated in Hamburg, Germany. This company created a product that repels most water-based liquids from any surface. The authorities sprayed this product on the walls throughout the district, along with signs reading "Wir pinkelnzurück" ("We pee"). And if someone tried to urinate, the urine would come back on them.

Winter Sun

Rjukan is a small Norwegian town hidden in a narrow valley that never gets direct sunlight in winter.

There were several attempts to solve this problem, dating back to 1913, when industrialist Sam Eyde devised a solution based on mirrors. However, it did not work.

In 2014, after a decade of research in advanced technologies, local artist Martin Andersen built three giant mirrors powered by solar and wind power. The mirrors are located at the top of the hill, and they follow the sun on its path across the sky. Through this process, it captures its rays, which are then directed towards the city center to the delight of the locals.

Parking Lots

Many parking lots now a days have a light installed in the ceiling above each spot. The lights have sensors and if they detect a car underneath, they turn red; no car, green; no car and it's a handicap spot, blue. Because they're on the ceiling, you can see the lights from across the lot so you never have to bother driving up and down the aisles.

Dexta Haptic Gloves

When utilising virtual reality, Dexta haptic gloves were created to simulate touch feelings of hardness, softness, springiness, and more. As the user interacts with things in their VR experience, the gloves replicate these feelings by locking and unlocking the user's finger joints to various degrees.

Healthcare

A holographic interface that generates live, 3D models of patients' hearts to help surgeons improve accuracy during minimally invasive procedures.

A suite of smartphone-based video games that allow specialists, such as pulmonologists and gastroenterologists, to practice diagnosing and treating a wide range of diseases.

A prosthetic control system that gives amputees nuanced upper-limb command using the electrical impulses produced by their muscles.

An app that uses machine learning to help diagnose dental conditions and oral cancer.

A portable EEG device that enables clinicians to assess brain trauma related to seizures and cardiac arrest in as little as five minutes—compared to the typical four-hour response time.

Agriculture

New agricultural equipment and devices can be engineered to prevent injuries, removing the need for manual handling involving the use of knives in small spaces; repetitive strain injuries and spinal injuries – moving people out of these processes and into other activities that increase overall productivity.

Labor forces are dwindling in some farming sectors, with reliance in some areas on low-cost skilled imported labour. This reliance has been most recently highlighted during the Covid19 pandemic.

The outer space team is developing horticultural processing and sorting equipment with agriculture technology clients to make harvesting safer and less labor intensive. We are designingand developing sensor-driven farm equipment and robotic systems to improve productivity and support agribusinesses as they constantly adapt to local and export market demands.

Animal Safe Detection

Out of Box Solutions, developed and refined their animal detector system. The detector is a sophisticated IoT system, that identifies if an animal is a native species or an introduced feral pest. It's designed for use in wildlife parks, remediated land areas and farming properties to record, detect and control feral, farm and native animals.

V. CONCLUSION AND FUTURE WORK

This paper mainly introduces the research methods of human-computer interaction interface design based on design psychology. With the continuous development of world's economy and the continuous progress of the times, the traditional research methods of human-computer interaction interface design have already lagged behind the times. People's demand for human-computer interaction interface is more and more inclined to emotional, psychological, and other aspects. Therefore, in order to adapt to the new requirements of human-computer interaction interface in the new era, this paper puts forward the research method of human-computer interaction interface design based on design psychology. This paper investigates and studies the development status of human-computer interaction interface design research methods based on design psychology in the World, and understands the frontier demand of human-computer interaction interface in the new era, so as to formulate a set of research methods of human-computer interaction interface design based on design psychology which is most suitable for the development of the new era.

REFERENCES

[1] The application of cognitive psychology to user-interface design - https://uxdesign.cc/the-application-of-cogntive-psychology-to-user-interface-design-81599ad7fb55
[2] Outerspace – Product Design and Agtech - https://outer-space.co/product-design-and-agtech/
[3] Psychology in Design Principles Helping to Understand Users - https://blog.tubikstudio.com/psychology-in-design-principles-helping-to-understand-users/
[4] Psychology of Design - https://alistapart.com/article/psychology-of-design/
[5] Human Computer Interface Design Based on Design Psychology - https://ieeexplore.ieee.org/document/9424849