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RETAIL EFFICIENCY AND PRODUCTIVITY ENHANCEMENT THROUGH ERGONOMIC DESIGN

Ooi Boon Jiet[1]
[1]Universiti Sains Malaysia, Penang, Malaysia;
Ahmad Zuhairi Abdul Majid[2]
[2]Universiti Sains Malaysia, Penang, Malaysia.

ABSTRACT

Ergonomic design is one of the primary keys in improving the retail business process efficiency and productivity. Design concept & methods applied in the following research are applied on back-end processes of retail management and not standard B2C (business to consumers) environment. Major parts of the research are applied on live-project and hence the results of this research are highly dependent on thousands of users' feedback and critiques.The hypothesis of our designer is proved, that through controlled design environment and actual customers' feedbacks, an enhanced ergonomic design in retail management is able to increase the user to perform daily retail management task significantly faster. Human made error were greatly reduced and precision of the expected results were a lot higher. Not to mention training hours for new user to adapt to the new design are decreased from 12 hours to less than 3 hours (An average of 300% decrease on training hours). These design methods in ergonomic design are hence proven to enhanced retail efficiency and productivity with immediate and significant effects.

Key words: *Retail Service, retail management, industrial design, design strategy, consumer*

1 INTRODUCTION

Ergonomic design is one of the key points in creating innovative design in retail business process. There is no doubt that if one could understand and re-design the entire process of retail business, the productivity and enhancement of retail business process could increase with limitless potential. However, something blinds plenty of practitioner in retail design in some degree, that is, the complex multi-disciplinary in the entire retail process. To make things worse, ergonomic design has a core focus on human being, and human being are something that is really complicated. Hence, the entire user experience in retail business is a design that doesn't just happen on virtual screen and intangible product but on actual physical products and user reaction, feelings and emotion as well. In conclusion, I believe that if one could unlock the potential of ergonomic design and user experience design in retail business process, it would be one of the primary reason for a retail to succeed in the market.Retail was once recorded as a noun with the meaning of "Sale in Small Quantity". However, things have drastically changed today. Regardless of increasing B2C retails (Business to Consumer Retails) in all developing country, often there is a misconception where "Retail Business Process" and "Design" doesn't work together. The fact is, design was no more deemed a luxury that only big company can afford. In order to push a retail business to full potential, a good user experience design has to bring into this matter. A "Productive and Efficient" design in business should be able to impact the company of the time with its birth. This is the era of efficiency. Albeit the fact that it is also an era of instant gratification and thinner patience for the retails, it is also an era where time is not just gold, but doors with countless opportunities that can slam shut with just a few second's delay. This is especially true in the fast-paced world of business where money zooms through fiber optic cables and zaps through air literally as business transactions are done through the click of a key. Therefore, design has an important role to contribute into any retail business, not just front end but back end processes as well.

2 USER EXPERIENCE DESIGN CONCEPT

User experience design plays an important role for an ergonomic design in everything. It is often defined as “The way a product behaves and is used in the real world.” A good user experience design is in the meantime defined as “A positive user experience is one in which the goals of both the user and the organization that created the product are met”. In order to draft these design concept clearer, the following diagram will show these design terms interact with each other in a hierarchy sequence.

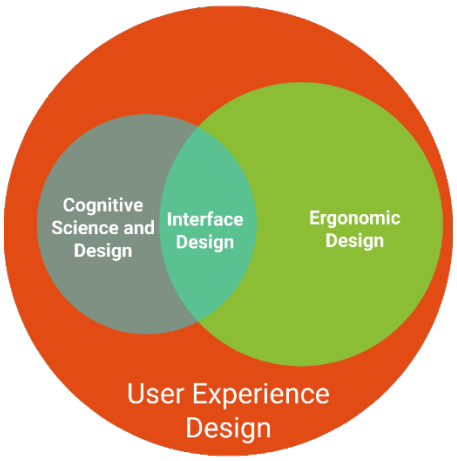

Fig. 1 A Venn diagram showing these term act in hierarchy

UXD (A.K.A. User Experience Design) is not a design that just concern about the user, but a design field to find the precise spot between the user’s needs and business goals, on the same time, ensure that the design is on the brand.

2.2 USER EXPERIENCE ELEMENTS

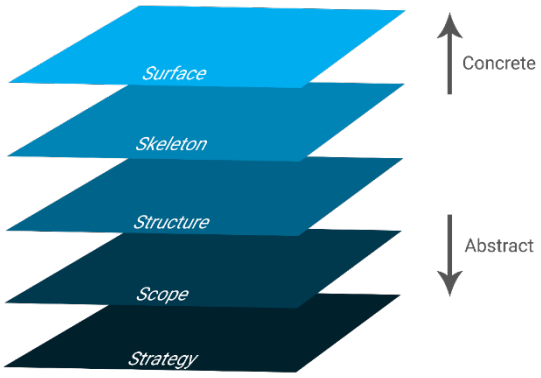

Fig. 2 User Experience Elements

The figure above explained what user experience is and how it is built. User experience are created and designed from scratch. Provided with nothing but abstract expectation, a UXD designer are required to build the foundation of a user experience, which is the Strategy Plane. The first and most abstract plane are the core foundation of the entire design. It is used to confirm and identify the necessity of this design and what are expected from this design. In

layman term, how to define this design as a success after the entire experience was designed? Advancing to 2nd layer after this, which is the Scope Plane, is where the designer and engineers identity the scope of functions and services that are going to be included in this design in order to succeed the statement made in 1st layer. 3rd layer (Structure Plane) is then proceeded to put all these defined scope of functions and services into hierarchy plans, which is a complicated but comprehensive map to show how user will start from starting-point A to achieve different type of results. (Preferably known as end-point B, C, D and so on.)

The entire structure can take hours of planning and reconstruction. Upon completion, the structure of the entire design will be finalized in order to confirm again that the stated design plan is able to fulfill 1st plane statements. Proceeding to 4th plane (Skeleton Plane), a series of complex design methods will applied to aid cognitive recognition to guide user, in order to somehow make sure the user follow the hierarchy plan. Any slight design error in this plane will caused user to jump steps or stuck in a so-called the "loop of infinity" or "dead-ends", resulting massive destruction in user experience on using the functions or services. Last but not least, the last plane (Surface Plane) is the visual identifying plane that define how the entire functions / service will looks like, including the colour theme, design movements and general appearance.

These UXD elements are equally important to make sure the entire experience are perfected, easy and satisfying to use.

2.2 UXD EQUATIONS AND "THE UX HONEYCOMB"

User experience design are often summarized as a simple equations, which often known as the "User Experience Equations". The following parameters sum up the equations.

Business Goals + Customer Goals + User Interface + Back End Process = **User Experience**

Whereas the outcome of a positive user experience is always the combined results of multiple, intentional attributes. Credits to Peter Morville, a person who sum up the aspect that defined the results of a good User Experience, and made it into a well-known diagram known as the UX Honeycomb shown below.

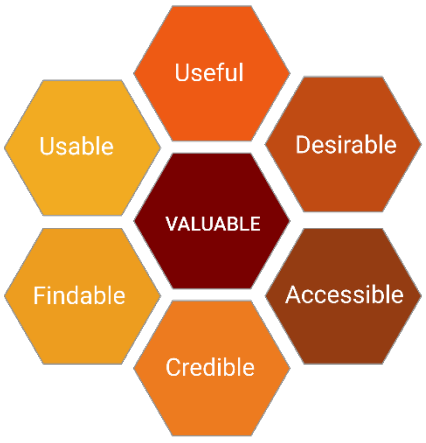

Fig. 3 Peter Morville UX Honeycomb

From a more tactical aspect, UX design is the combined results of multiple aspect. Mostly starts from user research, where designer study what the user needs. Followed by interaction design and visual design, which is the defining activity that finalized the overall appearance of the

product or services. Other crucial aspect activity that do the final touchups are information architecture (how the information are displayed and stored), front-end development (Development progress from the engineers), writing (Displayed text) and user testing (Bug elimination).

3 APPLYING ERGONOMIC DESIGN AND UXD IN RETAILS

Ergonomic and User experience design that states in the following context is different from design that built for standard front-end retail business. (Such as Consumer-related apps / interactive web / company branding) However, it is design that built for the business process spine or the so-called “bridge” between the retails and the consumers.

3.1 USER INTERFACE AND INTERACTIONS DESIGN IN RETAILS

3.1.1 DESIGN ENVIRONMENT FOR RESEARCH APPLICATION

Xilnex is the prime software produced by Web Bytes Sdn. Bhd. based in Malaysia. The software earn profits as SAAS (Software as a Service, which the retailers would subscribe Xilnex on a monthly basis. This software mainly focus on providing a series of services for retail business that includes inventory management, client management, Points of Sales, F&B, etc. It could now easily ranked number 1 in the region with the functions it provides. However, since its launching 5 years ago, Xilnex has experienced an exponential growth locally but not on the over sea country and SOHO business. The slow growth velocity on oversea has caused the company hard to penetrate to over sea market.

User-interface (UI) design for business software is a relatively new field for product designers in Malaysia, but one with great potential. On this context, we demonstrates how user-oriented design in user-interfaces can greatly appeal to users and increase efficiency. Based on powerful examples of today’s UI giants (Facebook, Google, Apple and etc.), UI-oriented companies are raking in the big bucks because being UI-oriented means being user-oriented and having consumers in mind during the design process, and this greatly appeals to consumers.. UI design does not only appeal to the aesthetic demands of consumers. Instead, the thoughtfulness and consideration given into a design that maps out the organization system of the software does, allowing ease of access with less time fumbling around poorly-organized interfaces to get to what they want. An ongoing live project and a viable case study the designer was involved in with growing business software Xilnex has yield results that within just two months of its launch, its newly designed UI has successfully cut cost on on-site support, shown drastic decreases in number of human errors and confusion while using the software, greatly reduced the amount of training time needed for new users, and also a massive flow of satisfactory user-feedback and user-impression. The new design release has drastically raised the selling price of the software with the new impression it gives and the efficiency it delivers. Design is no longer an optional criteria that can be cut to increase profit margin. It is now a non-negotiable necessity.

The following context includes several ways out of many on how applying ergonomic design and UXD yields promising result for a software house like Web Bytes Sdn. Bhd. that primarily serves for chain store and retails.

3.1.2 APPLYING STRATEGY IN RETAILS PROCESSES

Xilnex is a dynamic software that keep improving through customer request. However, due to overwhelming request, the engineers would produce hundreds and hundreds of unique functions and clumped the software with hard-to-digest technical and sales term. This causes huge problem for the company to get more user without closing sales face to face. (Primary reason for the slow growth rate on SOHO and oversea company).

The new design implementation includes a function-register-process for the engineer into the company Standard Operating Procedure. This implementation is designed for the engineer to identify the needs of the user and what the engineer need to achieve before start coding the

functions. This easy and simple methods reduced many redundant functions and make the entire software cleaner.

3.1.3 “UI KIT” APPLICATION

Often a lot of local retail business software are hard-coded functions and templates. Visual aided images are often brought from stock photos (which often doesn’t have an in-depth relation together with the functions) or 3D drawn buttons (Increased complexity with no reason). Every images / colour / theme that applied in a design need to have a reason. Without a proper reason for the application of visual images, they will be considered decorating and not designing. Hence, by applying a standard UI KIT in a development team, everyone can refer to the guided kit and use a standard cognitive materials together.A standard cognitive materials allow the entire software to unite and works in harmony. It speed up the process for both the creation of functions and the speed of new user to understand and learn the software

3.1.4 “NOW CONCEPT”

“NOW CONCEPT” is a very new concept developed by our designer, it is still at an experimental stage that developed with a single yet simple mind set. “Show only what the user needs to know and manipulate”. Through experience and customer feedbacks, there are often plenty of time where user doesn’t have the needs to look and adjust all the information on a screen. The “NOW CONCEPT” is a concept that eliminates all the unnecessary information off the screen or services. Often needs extended study to user behavior, the designer and engineers will slowly take away unnecessary information and option tools off the screen, hiding not-so-often-used-settings and functions, but auto display it whenever they found it necessary. This approach further decrease the complexity of the usage and turn the entire software into something “smart”.

3.2 ENHANCED ERGONOMIC CONCEPTUAL BARCODE SCANNER IN RETAILS

A barcode scanner brings forth at most two types of impressions to the listener’s mind: a stationary square box on the countertop with red light strips; or its mobile, handheld version. The designer challenges these typical designs by integrating functionality with the human body into a wearable technology that works seamlessly with the physiology of the user to obtain efficient results. Imagine –a powerful barcode scanner that can be slipped on fingertips without restricting usage of the hand or fingers during the item-scanning processes. How much time can be saved

compared to a cashier fumbling single-handedly with an item, tossing and turning it to look for the barcode, or a stock keeper balancing precariously on top of a rickety ladder with one hand tightly grasped on a barcode scanner and the other on the item he is looking for? Safety issue aside,

Fig. 4 Barcode Concept Art

the aim of this design is not only to save time and increase efficiency, it also aims to increase profit. The long queues at cashier counters are limited by the speed items can be scanned and paid for. This is an issue that can Thumb-Bytes aims to tackle with the newfound ability to count cash, swipe cards, punch keys, and handle receipts without the constant and repetitive need to pick up and place down a scanner that requires two-handed operation, but instead with a device that can be implemented onto the hands of the user and allows unrestricted usage of the hands. By every second the checkout line is accelerated, consumer's mood will be happier (with higher return chances) and profit turnaround will be greater. Instead of hiring more part-timers and opening more checkout counters, it's the little things that can be a game-changer.

3.2 CONCEPT DESIGN PROTOTYPING

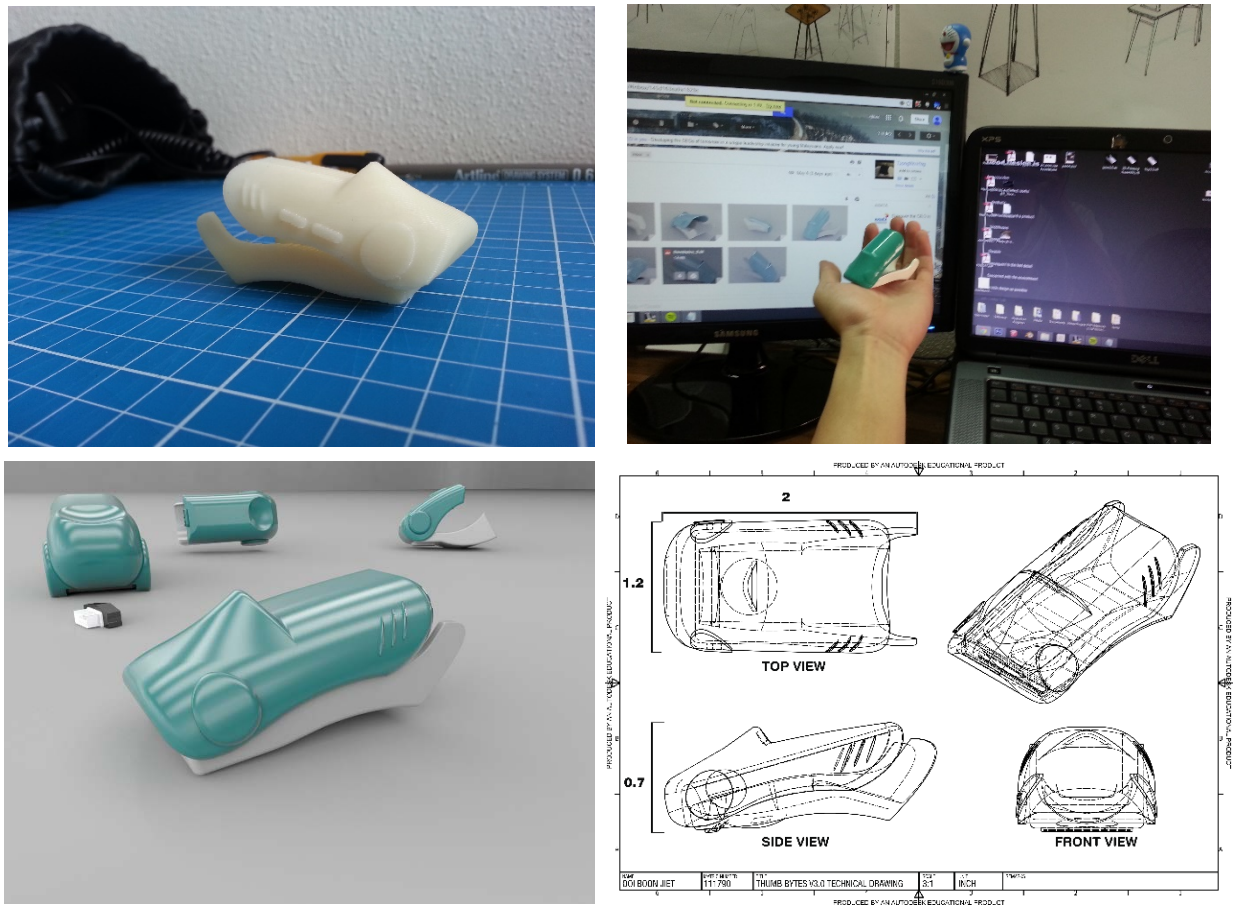

Fig. 5 Prototyping Progress

4 Conclusions

Through Thumb-Bytes' Rapid prototyping, a promising improvement has been observed on the amount of time saved for the item-scanning process in retail businesses. It is expected to save millions if this prototype is to be integrated in large-scale retail businesses. Xilnex, the live project which underwent a UX-orientated design development, has yield a 30% increase in sales just 3 months after the project started. It is expected to increase the company capitals and profit more efficiently than any other development the software has been through in the past 3 years.

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