PROPOSING “UNI-FRAME” AS A DESIGN PATTERN FOR SERVICE PROTOTYPING

Development of A New Representation Tool for Service Designers

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Abstract: Simulation and prototyping is one of important challenges in design, which is essential for designer in order to express and visualize the final condition of their ideas in the early stage of design. In the case of physical products, such a figure outing and imagination is simply possible through making actual models and real prototypes. But opposite of product, in the case of service, due to its characteristics and requirements, the format and the quality of prototyping is totally different and unique. So prototyping of service in the design is still an obstacle that is facing designers.

Inspired of Japanese concept of “Muda”, this paper proposes a prototyping pattern in which the service user experience is simplified into two parameters: “Customer-perceived value” and “Muda” (futility; uselessness; idleness; waste) as unique point of service prototyping. Then utilizing Dr. Marvin Minsky’s cognitive pattern, this service design prototyping tool is simulate in the framework of “uniframe”.

This research type is the kind of developmental study. Data gathering was done by librarian method. The main goal of this research is to obtain to a general prototyping pattern for service representation as a pen-paper tool in the early stage of service design.

Keywords: Service Prototyping, Design Pattern, Uniframe Concept, Value, Waste

1. Introduction

Prototyping is an approach to developing and testing ideas at the early stage before large-scale resources are committed to implementation [1]. It helps designer to imagine the final result. Prototyping as a kind of modeling helps users and stakeholders to figure out the outcome as well as to know how to work the final system. Though prototyping is recognized as an important part of most design disciplines, because of the attributes of services as design objects, it might be even more important for service design [2]. So due to differs of the representing in the products and the services, the same routine ways of products prototyping can’t be used for service simulation.

With regard to uniqueness of service prototyping which is arouse by service specific characteristics such as heterogeneity, inseparability, perishability and chiefly intangibility, it is necessary for service designers to know and utilize the relevant methods and tools to imagine and evaluate their related ideas to designing services. This study strives to propose a new method for representing services with emphasize on value and waste as a unique point for service description. The main goal of this research is to obtain a stereotype of prototyping toward the services to understand and perceive the designed service, to identify the weaknesses and to make a solution framework for these problems as a service design pattern.

2. Design patterns; problem-solving stereotypes

In the 1977 the concept of pattern was coined by the Dr. Christopher Alexander in the field of architecture by issuing “A Pattern Language” book and soon this idea had been adapted for various other disciplines such as entrepreneurship [3], systematic innovation [4], software engineering and computer science [5]. A design pattern is a formal way of documenting a solution to a design problem in a particular field of expertise. The common definition of a pattern is “A solution to a problem in a context”. Each pattern describes a problem which occurs over and over again in our environment, and then describes the core of the solution to that problem, in such a way that you can use this solution a million times over without ever doing it the same way twice [6].

An important aspect of design patterns is to identify and document the key ideas that make a good design different from a poor design and to assist in the design of future systems. The idea expressed in a pattern should be general enough to be applied in very different systems within its context, but still specific enough to give constructive guidance. Still, the problems and solutions described in a pattern can vary in their level of abstraction and generality on the one side, and specificity on the other side. In the end this depends on the author's preferences. However, even a very abstract pattern will usually contain examples
that are, by nature, absolutely concrete and specific. Knowledge of the patterns that have worked in the past allows a designer to be more productive and the resulting designs to be more flexible and reusable. The most efficient way to solve a problem is to already know how to solve it. Then one can avoid search entirely. Experienced designers reuse solutions that have worked in the past.

3. Services as problems to be solved
A service is often a specific benefit that the customer obtains, for example, in terms of convenience, time saving, physical transformation, or a value adding function for customers’ possessions. All these can be viewed as different types of problems. For example the customer can seek a solution for a broken car (solution=repair), monetary assets that are in redundant use (solution=financial advice, e.g. wealth management), transportation (solution=a bus service/taxi), or uncertainty over the target market’s needs (solution=market research/consulting advice). All these examples include a given problem which has been identified, and in other side, an appropriate solution which creates value.

The problem-solving perspective can be used to describe the identification and solving of problems inside a service. In other word, we can extend the problem-solving logic to cover the customer interface in order to describe the service design through this perspective. Services can fundamentally be seen as “problems to be solved”.

4. “Uniframe” as a service prototyping pattern
One of the effective ways to describe a system is the concept of “uniframing” proposed by cognitive scientist Dr. Marvin Minsky [7]. Uniframe is a strategy of simplification in which it is focused on universal definition formerly concrete details are left ambiguous, vague, or undefined. Uniframe may be formed by reducing the information content of a concept or an observable phenomenon, typically to retain only information which is relevant for a particular purpose.

When seen this way, different kinds of a phenomenon seems much more similar. This is because they all serve common purpose despite the great diversity of their physical appearances. Uniframing is the process of categorizing things, applying a general description to a number of things at once. It can be thought of as a pattern or a mental model. For example, we each have a uniframe for those things known as fish. When uniframing, we essentially compare new information with what we already "know," and categorize it according to already developed frames of reference.

Uniframe approach disregards discrepancies in favor of imagined regularities. It tends to be perfectionists but also tend to think in term of stereotypes. This sometimes leads to recklessness toward omission because it has to reject some evidences in other to make a norm formulation. Indeed, focusing on a gist as unique point and omitting the other redundancies and details, a uniframe ignores discrepancies in similar systems to make an overall descriptive pattern by redefines it as general axiom.

4.1. The unique point of the service prototyping
Service design is a holistic approach. There are various perspectives to see a service. It is simply impossible to consider every single aspect of service. Genuinely working in a holistic way is an illusion and we have to take a viewpoint and omit other aspects of a service. So to prototype a service, first of all, we need to define a unique point. This helps us to simplify a service in solely one feature which service may be described through it.

4.2. Customer-perceived Value
The unique point of prototyping service in this paper is “customer-perceived value”, the “gain” versus the “pain” during the service user experience.

This prototyping is based on the representation of a pattern in which the simulation focuses on main customer-perceived value through the waste reduction.

In other word in this article we strive to propose a representing tool to demonstrate what the customers obtains against what they suffer while they experience a given service. Indeed this model describes service based on the straightforward relationship between perceived benefits and perceived costs. This is one of the prevalent definitions of “value” in term of service marketing. Value is the benefit that a customer can gain from a service. The user experience is essence of each service. The value is created during this experience. The value can be defined only by the ultimate customer and from the customer’s standpoint this is why the service exists. Seeing from the perspective of who consumes a service, “value” is defined as any action or process that a customer would be willing to pay for. But services usually are not pure value. Mostly in every service customers have to endure disadvantages that they dislike them. Usually there are some kinds of waste in each service. Bicheno and Holweg (2009) enumerate common seven types of wastes in service industry [8] that lead to the value debarment. So
customer-expected value (the value defined from the client standpoint) can be promoted in two different approaches: to increase profitability (the numerator); and to reduce cost and futility (the denominator). A good service is one in which customer can easily pull the value within the service flow. Particularly in service areas, the customers often define value as utility derived from the service flow and less pay attention to monetary price. So in the case of the services, “pain” is more noteworthy than “pay” for customer. In addition due to using every services, users have to pay, when we are going to compare services, we can omit monetary “pay” and only focus on other kinds of “pain”. It means nonmonetary costs such as waiting time and inconvenience are important wastes in services.

As it already mentioned of above value formulation, the customer-perceived value can be increased in two ways; increasing of “benefits” in the service or decreasing of “drawbacks” in it. Here the drawback includes all forms of cost (waste, inconvenience, loss and etc.). Based on the organizational policy, service business firms adopt one or both of these tow strategies. For instance “Lean Enterprise Philosophy” pursues the second approach and strives to consider the expenditure of resources for any goal other than the creation of value for the end customer to be wasteful, and thus a target for elimination. In fact lean services try to focus on reduction of the waste to improve overall customer value, instead of increasing the benefits.

Inspired the Japanese key term of lean “無駄 (Muda)”, the unique point of prototyping in this research is redundant in a certain service that do not create value; The steps that should be uncompromisingly eliminated or should be perfect from the standpoint of the customer. In the designed service the activities in the service process can be derived into three categories: Many steps will be found to unambiguously create value. Many other steps will be found to create no value but be unavoidable in current condition. Many additional steps will be found to create no value and to be immediately avoidable. We can consider the last two types of Muda as non-value-added actions that are seen as waste by customers during service usage.

4.3. Representing service in framework of “UniFrame”

In consistent with Minsky’s concept of uni-framing, service can be considered as set of frames (sequences) in a scenario. Based on this idea, “Service UniFrame” pattern redefines this scenario by clarification of three parameters: “Enforcement” or what service frames should be, “Debarment” or what it must not be and finally “Tolerance” or what it can be. "Enforcements" implies to the all the requirements that govern on the service frames. Every service requires its frames to insist on some imperative situation. Indeed “enforcement” is the inclusive attribute of the uniframe paradigm that emphasizes on the consideration of all the essential features. On the other side every service uniframe requires to reject service frames that are not eligible and qualified.

“Prevention” attribute of the uniframe implies to the all banned states and structures that service frames can not and must not take; A way to keep from accepting an undesired situation. Finally “tolerance” refers to the all accepted cases that service frame can take; Tolerances are other sundry structures don’t play any role in the service function and has not any affect on the service frame but remove the “preventions”. Tolerance is the flexibility attribute of uniframe that makes the creativity opportunity for value creation in service refinement. Tolerance is the passable and admissible variations solution in the service design pattern. This allowable alternative must be neutral and indifferent toward “enforcement”. In other word alternative wouldn’t have any effect on enforcement, but they create value by removing “debarment” or transform it to “fulfillment”.

<table>
<thead>
<tr>
<th>Service Uniframe:</th>
<th>Pizza Delivery System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enforcement</td>
<td>Pizza transportation to the customer's home.</td>
</tr>
<tr>
<td>Prevention</td>
<td>Disoriented or cold pizza</td>
</tr>
<tr>
<td>Tolerance</td>
<td>Transportation Vehicle</td>
</tr>
</tbody>
</table>

Figure 2. Example of Service UniFrame of food delivery; Uni-Frame creates the most general quantification

4.4. Simulation

Visualization is important in every fields of design. It is much more important in service representation as well. Because service is already abstract. To compound the abstraction dilutes tangibility that the prototyping is trying to enhance [9]. Having an overall insight toward a service at early stages of design process, designers can’t only rely on mentally imagine it in their mind. On the contrary, they need to make it more concrete by visualization.

To simulate this tool, it is proposed to utilize color code visualization or use colorful stickers in which green is indicator of demand situations, red is indicator of pain situation and blue is indicator of what should be done by client to obtain demand target.

Every service user experience can be summarized in a main intent and a set of marginal activities which are performed by the user in order to achieve that main intent. For instance, in a banking service, customer wouldn’t like to get in line or even to learn how to interact with ATM machine. However the customer just would like to cash money from ATM, but in order to cash money, he/she should find an ATM, queue, carry the cash card with himself/herself, remember his/her security codes, enters it into machine and so forth.

Figure 3. Main intent and set of mandatory marginal activities in ATM service user experience
Our initial objective in creating a service prototype tool identifying every action required to represent a specific designed service is to sort these actions into two categories: First, service enforcements, which are exactly what the end user wants (to be done) and actually create value as perceived by the customer. Let’s call them “service enforcement”. Second, those which create no value. The second category can itself be divided into two types: First, those which create no value but they are currently required to fulfill the service (service Fulfillments). Another type is what the customer wouldn’t like to do them; those waste stages which don’t create value as perceived by customer and so they can be eliminated immediately. Let’s call them “service debarment”.

Figure 4. “Service Uniframe” as a pattern simplifies a service based unique point of “value creation”

Using such a simple diagram, service designers can easily simplify and represent the problem statement from the certain point of view. They can also redefine the problem statement in different point of view through supposing every non-valuable action as “prevention”. Then, in the next step service designers strive to creatively generate alternatives which can be replaced with non-valuable actions to improve them from the state of prevention to the valuable actions (enforcement state) or fulfillment state. This should be effect only on non-valuable actions and according to what Minsky defines as “tolerance”, it should be neutral of valuable actions.

With such a universalization prototype, designers have an easy understandable representing model to simply find out the current critical points which should address them. The priority is to generate ideas to remove preventions or replace them with a useful action; Then, to create new options instead of current tolerances. And finally to develop the enforcement in order to customer can earn more value than exist demand target. In addition, utilizing this prototyping tool designers can easily compare services too.

5. Case study: uniframe of “waiting included” service
Many services involve a kind of waiting experience for customers. Standing in queues, delaying in stations or airports, looking forward to receive a consignment, expecting to a process be completed or something be done and so forth. The waiting time as a significant problem appears to influence the overall quality of a service and typically is an unpleasant experience and hence, people’s retrospective evaluation of the service is negatively related to the duration of the wait.

In the following we are going to prototype the food services (as a quotidian waiting time sample) in the “uniframe” pattern.

5.1. Removing/shortening the waiting times in the service design
An important factor that will affect customer appraisal of the wait is the length of wait. Therefor the first priority to solve the waiting time issue in each service is to attempt to counteract time of waiting by shortening or even removing the real waste time (objective waiting time). Taking the strategy of flexible capacity and extending it during the period of peak demand are usual in this respect. Adding more employees, facilities and equipment, are the samples of management solutions for minimizing delay during the service delivery. But from the viewpoint of design, another approach to extirpate the waste time in preparing a service for customer is to design service according to the age of information technology; Utilizing techniques to control the demand using reservation or internet-based preorder a service by clients through the service provider website or via its smartphone application.

Figure 6. “Distraction” pattern as a solution for problem of the waiting time in the restaurant service uniframe.

5.2. Making waiting time as endurable as possible
However it is not always feasible to more reduce objective time of waiting, when the demand and capacity can’t be matched, or because of lack of control over the queuing situation or due to cost considerations. In this case, when objective waiting time can not be shortened, the alternative approach is to find ways to make time pass as quickly and pleasantly as possible. Making waiting time more tolerable customers feel less burden and can endure it easier. To this end, it is essential to provide a
special place for waiting, and doubly essential that this place not have sordid, enclosed, time-slowed character of ordinary waiting room [10]. Pruyn and Smidts (1993) found that an attractive waiting environment directly and positively influences satisfaction with the service [11]. This proves that decoration and interior design can play an important role in the field of service design to increase tolerance threshold of customer toward delay to delivery of service. Specific mental stimuli, such as television, can be purposely positioned into the waiting environment to distract customer attention from waiting process. Explicit distracters in the waiting environment are supposed to affect the cognitive timer (internal clock) by means of distracting the attention from the passage of time itself [12]. This trick lead to customers perceive the waiting time less than what actually spend.

Figure 7. “Distraction” pattern as a solution for problem of the waiting time in the restaurant service uniframe.

5.3. Replacing waiting time with desirable event

Notwithstanding situations that make the waiting positive and more durable, the duration in when the customers can be patient toward waiting time is limited. Therefor if waiting time exceeds the patience threshold of the customers, in parallel with the facilities for waiting time, service should pay attention to desirable experiences as well. Replacing waiting time with something else that perhaps is fun or more bearable will make customers become more patient [13]. According to this service design prescripts, nowadays many service companies use some ways to make customers have more patient, such as let them sit in the bar and order something, or offer customers a cup of drink while they are waiting.

5.3.1 Making backstage activities lively and visible

Commonly it is interesting for client to watch the backstage actions and sometime it is possible. In these cases, instead of putting extra attractive elements, the service itself can be designed in the way in which the customer are involved in the process of service preparing - at least as a viewer- rather than they just wait for service delivery. It can also accompany with some amusing embellishment. Customers feel less time passing and even enjoy whenever their ordered service is proceeding in front of their eyes. For example it can be so attractive for the customers of a restaurant to watch the process of food catering rather than they sit and look forward waiter to serve their order.

Figure 8. “Presentation” pattern as a solution for problem of the waiting time in the restaurant service uniframe.

Figure 9. When the ordered service is proceeding in front of their eyes, customers feel less time passing and even enjoy.

5.3.2. Enter the customer in the service process

In the concept of service, the value is viewed as something that can be built into a service in partnership with other stakeholders. The customer’s role in such service “customization” is usually restricted to the end of the service creation phase and involves making suggestions for incremental changes to an almost complete service provision. In other word, the customer is usually cast in the reactive role of responding to options being posed by the service provider. So in the example of restaurant, the customers are interfered with the process of food preparation by choosing ingredient or self-service buffet. It is advantageous not only as a pleasure user experience but also for the purpose of user distraction toward waiting time.

Figure 10. “Customization” as a pattern for problem of the waiting time in the restaurant service uniframe.

5.3.3. Putting the customer at the center of service

Having everyone involved in customer service helps create a better customer experience. It can be consider as the notion of co-creation. Co-creation is one of the foundational premise of the service-dominant logic [14]. Customer are viewed here as associate participant seeking solution to the problems in collaboration with service providers. The difference between “co-creation” and “customization” lies in the degree of involvement of the
customer; in general terms, the customer plays a more active role in co-creation than in customization. The co-creation refers to the involvement of the customer as an active collaborator right from the beginning of the process of creation a service. Important to note is that the basis for the collaboration is the experiences that a customer has gained when using a company’s service [15]. As the services by their very nature involve intense cooperation between a client and a provider, the co-creation perspective suggests that the customers are the fundamental initiators (more or less consciously) of the problems (or the issue around which they have a problem that they have not specified yet) to which they seek solutions. In this case the customers perform effectively and take an active role in service creation and become the “co-creators” of services [16].

6. Conclusion
Service prototyping through uniframe includes some design advantages; uniframe as a pattern makes an overall view of main frames in service and gives a general description about the service. Regarding the creative role of service designer in enrichment of service, the chance of innovation in the service would be increased by changes in its service frame. The ‘service uniframe’ as a tool helps designers to unconsciously diverge design imagination to all visualized alternatives toward structure of physical evidence. Designers highlight the critical service frames as “preventions” and then they focus on relevant service frame to replace them with alternative solutions.

7. References