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Two Directions of User-centric Approach to Identifying New Service Opportunities: Vacuum to Solution and Practice to Niche

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Abstract. The importance of user's potential needs and, therefore, the relevance of user-centric approach are growing in identifying the opportunity of service innovation especially for IT and mobile industries. Literatures show that there have been two directions of user-centric approach, 'filling up the blank' as well as 'transforming commonly used principle'. However, the mainstream of user-centric approaches has been focused only on former, attempting to fill the unmet needs. To complement this limitation, this research suggests two methods for uncovering opportunities to create new services using the user-centric service map: 'vacuum to solution' and 'practice to niche'. Specifically, this research provides procedures and criteria for discovering and evaluating the right opportunities by employing an illustrative example of mobile application services in App Store.

Keywords: service opportunity, user-centric, vacuum to solution, practice to niche.

1. Introduction

Identifying and selecting the right opportunities for new businesses are core abilities of successful entrepreneur [1]. This is especially true for competitive and fast-moving service industries such as mobile services or ubiquitous services. In order to respond to dynamic market trend, firms should continuously make innovation and accordingly discovering appropriate opportunities for innovation is critical. Then, where does the idea for innovation appear from? Traditionally, the main sources of opportunity in service innovation are the user needs. Especially, the potential needs is highlighted instead of expressed needs because customers have trouble imagining and giving feedback about something that they have not experienced [2]. A user-centric approach to make a closer investigation of user context or to secure their active involvement in identifying their needs is one of effective and proactive tactic for uncovering potential needs [3, 4].

As a next question, how does the idea for innovation appear? In the literature, there are two way to identify the service opportunities for innovation from user needs: filling up the blank and transforming commonly used principle. *Filling up the blank* is the process of finding out the solution for 'unmet user need' [5]. It is related to invention, which is the mainstream of innovation. For example, an invention of smart phone in the age of feature phone is related to filling up the blank. However, this method needs for investigating whether the blank is valid as a starting point of successful innovation, thus it cannot fully assure the success of innovation. In contrast, *transforming commonly used principle* is an approach to adopting 'settled patterns' for niche application area [6]. This is connected with design approach. For instance, iPhone is the result of design, transforming already settled pattern of mobile phone use into a new dimension or form such as touch interface. It can cover the uncertainty problem of former, because it aims to enrich the dimensions of patterns rather than fill the blanks by pursuing the changes of functions and forms continuously in the best practices and prevailing principles [7, 8]. The settled pattern has a relatively high reliability and effectiveness as a starting point of innovation. Despite challenges in the subsequent transformation process extracting the general level principle and deriving result satisfying value threshold, settled pattern itself is sufficiently attractive in the perspective of opportunities.

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User-centric approach is able to discover the opportunities in both two ways, because it accesses the potential needs related to *filling up the blank* and the pattern of usage associated with *transforming commonly used principle* simultaneously [6]. Therefore, 'user-centric service map' [9] can be a useful methodology to visualize both the vacuums and the best practices. Kim and Park (2010) suggested user-centric service map and showed the effectiveness of it as a tool for supporting complexity, variety, and mapping issues in user-centric approach. However, they focused on how to fill the vacuums with solution and considered a use frequency of adjacent services to derive promising opportunities from vacuums. Therefore, the structured and detailed procedure to opportunity development should be supplemented.

This research suggests two directions for uncovering opportunities to create new services using the user-centric service map: '*vacuum to solution*' and '*practice to niche*'. Especially this research provides concrete procedures, criteria and guidelines for discovering and evaluating the right opportunities by employing an illustrative example of mobile application services in App Store. The remainder of this study is organized as follows. First, the literature about user-centric approach and the concept of user-centric service map will be outlined. Next, research framework and the detailed procedures involved in identifying opportunities from the user-centric service map are proposed. Finally, this paper concludes by discussing the contributions and limitations of research.

2. Literature Review

2.1. User-centric approach

A user-centric approach is a method for improving the design of the user experience by capture users' requirements and insights via ethnographic observation methods such as empathic design [4] or participatory observation [10], and user involvement techniques such as a lead user method [11]. These activities also entail understanding and specifying the context of use, which may refer to the spatial, temporal, eventual situation of user. Context can be classified according to several criteria, but 5W1H is a popular way to uniformly describe a fact. The context can be defined and acquired either by enumeration and categorization [12] or by generic modelling [13].

2.2. User-centric service map

User-centric service map is a two-dimensional grid map in which information about potential needs and the needs satisfied with the existing services are presented [9], as shown in Fig. 1. It supports the user-centric approach by arranging the complex context information acquired in user study into visualized format. Three steps for developing user-centric service map are follows:

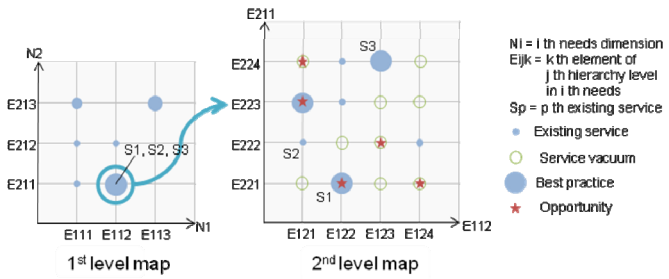

Fig. 1: User-centric service map

- Constructing a potential needs dictionary: The dimensions of the potential needs and their constituent elements are defined as a hierarchical dictionary. For example, the need N1 is a group of E111 to E113 needs as its elements and E112 has detailed needs elements E121 to E124 in second hierarchy.
- Evaluating the satisfaction of existing services: After collecting the existing services, services are evaluated with respect to the needs that are currently being met. A user-centric approach is utilized to identify in what context users can be as well as which services are used in that context.
- Establishing the user-centric service map: The results of the evaluation of existing services are mapped onto a two-dimensional map. S1, S2, and S3 have E112 and E211, and so are placed onto (2,

1) position as shown in the 1st level map in Fig. 1. When the (2, 1) point in 1st level map is zoomed in, 2nd level map is appeared by posing E112 at X-axis and E211 at Y-axis and S2 is mapped to (1, 2) position since it has E121 and E222. Higher level map is used for identifying scopes or areas of analyzer's interest and providing related clusters of services. Lower level map gets down to identification of the candidates of opportunity.

3. Framework for Identifying Opportunity

3.1. Overall procedure

In an attempt to recognize a new service opportunity, this research proposes two approaches: vacuum to solution and practice to niche. Vacuum and practice is detected from the user-centric service map. The overall process consists of five steps for each module as shown in Fig. 2.

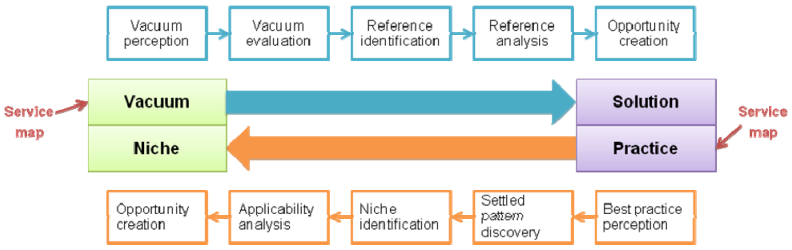

Fig. 2: Overall process of this study

3.2. Development of user-centric service map

This paper identifies a new service opportunity using user-centric service map to incorporate a user-centric approach into opportunity identification. In order to suggest the illustrative example, we analyzed the mobile application (app) services in Apple's App Store. The potential needs are constructed after defining Location(L), Activity(A), Objective(O) of context as a needs dimension and collecting the elements of context in the information technology or psychology related literatures. Then, 100 app services sampled from the lifestyle and healthcare category in the App Store, are evaluated their satisfaction of needs based on user review; a total 264 of records are gained. As a last step, the service map is established the data into two dimensional space. The example of A-O map, the result of matching activity and objective as X and Y axis respectively, is represented in Fig. 3. The pair of leisure activity and convenience objective is selected in 1st level map and enlarged as 3rd level map. The concrete description of this processes are found in [9].

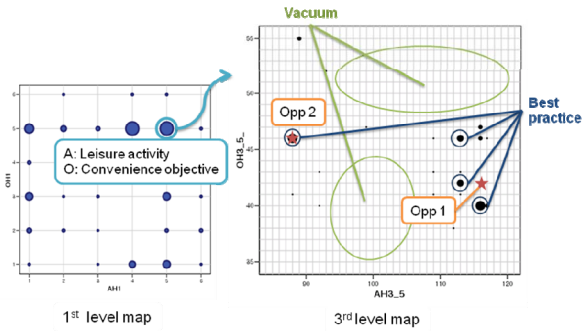

Fig. 3: Example of user-centric service map

The outputs of a user-centric service map are 'service vacuums', unmet potential needs areas, and 'best practices', highly occupied areas containing settled pattern as shown in right map of Fig. 1 and Fig. 3. They should be investigated to decide whether they appear feasible, valid, promising, original, or valuable.

3.3. Vacuum to solution

Since service vacuums are unoccupied potential needs and considered as a kind of question, an opportunity is discovered by filling the blanks with solution. As a result, the service vacuum and its solution are considered as an opportunity. Details are explained in next:

(1) Vacuum perception: Vacuums are recognized and listed from the lower hierarchy map. In Fig. 3, as leisure activity and convenience objective has 36 elements and 20 elements at 3rd level in potential dictionary respectively and 35 services are mapped in this map, there are 36×20-35=685 service vacuums.

(2) Vacuum evaluation: Three evaluation perspectives are employed. First, an evaluation of the *feasibility of needs* addresses whether the proposed combination of context can have any logical contradiction, or deliver specified value. For example, a combination of listen music (A) and location search (O) is not feasible context and excluded. *Fitness to market* can be evaluated by criticality of adjacent services such as their density, rating, or number of downloads. For example, the pair of attending performing art (A) and multifunction (O) is feasible context, but the number of users (or size of market) who want multifunction while attending performing art is not so many to consider and it is proper to eliminate. Likewise, *fitness to firm* can be assessed by fitness to the firm strategy, its existing resources, and development capability. In Fig. 3, the mix of weightlifting (A) and location search (O) (Opp 1) can be one of the selected vacuums.

(3) Reference identification: Now, the remaining service vacuums are not only feasible but also attractive – in terms of market and firm, the solution should be found. As the user-centric service map visualizes the set of adjacent services which satisfies the same elements of needs, they can provide the principles. Since not all of the relevant services can be a reference, proper references should be identified. For example, reference for weightlifting and location search can be *iFitness* and *YPmobile* respectively.

(4) Reference analysis: The reference services are analyzed for their principle to solution, how to satisfy service vacuum needs. In this example, *iFitness* satisfies weightlifting activity by providing relevant information and clear instructions classified with exercise category or body region, whereas *YPmobile* satisfies location search objective by offering local Yellow Pages based on their physical locations.

(5) Opportunity creation: Service vacuum and its solution are considered as an opportunity. The solution for Opp 1 in example can utilize the convergence approach by understanding location in *YPmobile* as body region in *iFitness*. Therefore, represents searching the location of body region and muscle targeted by each exercise to satisfy a need for location search in weightlifting situation.

3.4. Practice to niche

As best practices are highly occupied areas containing settled pattern, an opportunity is created by extracting the settled pattern and injecting it into a niche area again. Details are described in next:

(1) Best practice perception: Best practices are detected and arranged from the lower hierarchy map. Among the 35 services mapped in 3rd level A-O map of Fig. 3, the most frequent pairs are recognized as eat out (A) and information (O), weightlifting (A) and record (O), travel (A) and information (O), and travel (A) and location search (O). Each pair has best practices, for example, best practices for the pair of eat out (A) and information (O) are *OpenTable*, *Urbanspoon*, and *Yelp*.

(2) Settled pattern discovery: The principle is the unit and the level that can be shared with the new design and used in the actual design. In this paper, settled pattern embraces the principle extracted from the best practice services as well as the workarounds of the user group. Thus, the settled pattern is found from the services or users of best practice. With regard to former, this research attempt to identify settled pattern in the listed 3 best practices. *OpenTable*, *Urbanspoon*, and *Yelp* are satisfying eat out activity and information needs commonly by help or substitution for the part of actual service (e.g. reservation, menu selection), large amount of database connected with web service (restaurant information service), location searching, graphical listing, and social networking (e.g. review), which can be settled patterns.

(3) Niche identification: Niche in this paper can be current service which transformation and innovation can take place, as well as another unrelated opportunistic application area. In the example, when we think of the innovation of current service shown as Opp 2 in Fig. 3, there are room for apply the principle of 'help or substitution for the part of actual service' such as ordering menu, alarming the completion of cooking, and representing ingredient or calories of menu, etc.

(4) Applicability analysis: The injection of the principle of the new design case basically designed to secure the *originality*, and deliver the results beyond people's value limitation (*value threshold*). For instance, in Opp 2, the supplement of ordering function seems to have value to users, but if it is interpreted as the

ordering of home delivery restaurant, there exist such apps already. Accordingly, the preliminary ordering function that arises at anywhere before the user visits restaurant can have more originality and higher value.

(5) Opportunity creation: Opportunity is the most appropriate pair of settled pattern and niche. As shown in previous steps, one of opportunities can be pre-visit ordering function using the principle of 'help for part of actual service activity'. This is the result of transformation the existing principle into a new dimension.

4. Conclusions

The contribution of this paper is a systematic procedure to recognize opportunities for service innovation. In case of vacuum to solution, service vacuums perceived in user-centric service map is evaluated and selected for fitness of the market and firm, and elaborated into a solution by benchmarking or converging identified and analyzed references. On the other hand, in best practice to niche, best practices perceived in user-centric service map is analyzed to discover the settled pattern in it, and developed to match with niche by evaluating its applicability. These processes guide the development of opportunity based on both invention and design, not just opportunity recognition. This means the proposed approach systematically facilitates the conversion of an opportunity into innovation, especially successful one.

Nevertheless, this paper has some future works to eliminate limitations. Firstly, since framework in this paper is focused on overall procedures, framework must be concretized especially for the criteria of vacuum evaluation and applicability analysis. Secondly, although this research showed an example for illustration, case study can be done with explicit setting. This is important because we utilized the data about description and review on applications as a proxy for evaluating context of service use in user-centric service map.

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