


Underlying Motives; Investigating culture Impact on Changing Individuals` Reading Behavior through a Digital Service

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Abstract

Nowadays, service design is an inevitable part of the design; people use services as much as they use daily products. This paper tries to focus on the field of service design with a cultural approach. With the support of literature and a particular focus on the FBM model, it narrows down to reading habits as an element of culture and an individual's behavior. The research indicates that those with reading habits have underlying motives to accept new services according to reading. A survey of 81 participants supports the findings, and the discoveries are analyzed by the RGT method. A comparison study of the pattern of behavior is done by comparing the matrix of two divided groups of participants. This research is funded by Foreign Cultural and Educational Expert Project Digital Culture and Creative Product Design Technology System Construction for Cooperation between "One Belt, One Road" Countries (DL2021160002L).

Keywords

Design, Service Design, RGT Method, FBM Model, Culture.

Introduction

Culture is a complicated notion to define, and like many other concepts, culture is better comprehended as an umbrella term. Culture itself continues to influence many aspects of human life and be influenced by people (Razzaghi et al., 2009). Human interactions initiate culture and have developed in parallel (Chydenius, 2020). Many pieces of research indicate that a particular section of culture represents individuals' values, communications, and cognitive styles, which are deep-rooted in people's psychology (Pei-Luen et al., 2013). Among many explanations of what culture is, Kroeber and Kluckhohn articulated more attributes of culture. They stated: *Culture consists of patterns, explicit and implicit, of and for behavior acquired and transmitted by symbols, constituting the distinctive achievements of human groups, including their embodiments in artifacts; the essential core of culture consists of traditional (i.e., historically derived and selected) ideas and especially their attached values; culture systems may, on the one hand, be considered as products of action, and on the other as conditioning elements of further action* (Kroeber et al., 1952).

Dutch social psychologist Hofstede continued the precious work of Kober and Kluckohn. Hofstede elaborated on culture as patterns of thinking, feeling, and acting; *mental programs* or *software of the mind* was the given names to these patterns. These mental programs diversify into the social environments in which they were acquired (Hofstede et al., 2010). The mind's collective programming distinguishes the values and attitudes of one cultural group from another. Thus, culture builds people's ability to think in themselves and helps them have the unique human advantage of rational thinking (Yousif, 2020). Culture impacts individuals' thoughts, knowledge, experience, emotional satisfaction, and expressions.

Culture and Design

The influences of culture on design and the other way around were a topic of research in the past decades. The relationship between design and culture took many twists, as the design is seen both as a mirror and an agent of change (Moalosi et al., 2006). Thus, culture is shaped by design and shaping changes in design (Chydenius, 2020).

Design can be called a mirror of culture and an agent of changing it as well. The relationship between design and culture has been modified and comprehended in the last century (Moalosi et al., 2006). Thus, culture is shaped by design at the same time as culture changes design (Chydenius, 2020). The power of culture is becoming more and more prominent, the development of the added value of product culture is accelerated, and the proportion of humanization in product design is improved (Liu & Bao, 2019). The unification of culture gives products the meaning and values reflected in the form and features (Yousif, 2020). Besides the role of culture in products and the product design process, the fact that services do not take place in a cultural vacuum has also been recognized (Chydenius, 2020). Meanwhile, service is defined as a set of activities that delivers service contents through service channels from service providers to service receivers in a service environment and generates values for service receivers (Vasantha et al., 2012). Tansitpong (2012) claims that services are particularly affected by culture since culture determines how people think, decide, and act in their personal lives and at work.

Moreover, Chydenius (2020) clarified that several approaches to culture within services exist. Firstly, culture can be viewed as part of service. Secondly, service(s) can be viewed as part of the culture, and the third approach of connecting culture and service(s), service research and theoretical foundation can be seen rooted in a specific culture, for example, in Western or Eastern cultural research traditions and the cultural background of the scholar(s). Although some studies accomplished the mutual impacts of culture and services, there is still room for further studies in this context.

Regarding the explanations of the overlap of service, design, culture (Figure 1), and their interplay, consideration of behavioral shifts through service and culture will come into the discussion.

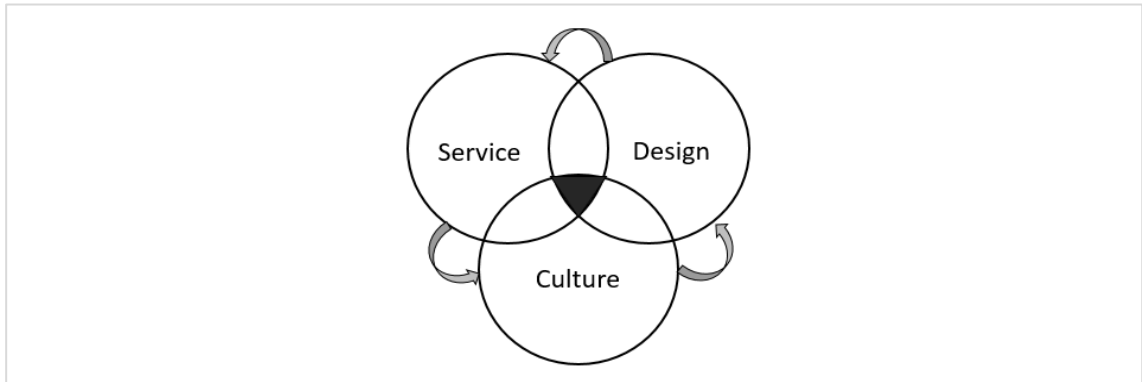


Figure 1: Schematic view of common scope among service, design, and culture (adapted from Chydenius, 2020).

The authors have considered the relationship between culture and behavior in this research from two perspectives. The first one is that Lloyd (2003) demonstrated the influence of culture upon behavior through values and attitudes (Figure 2). She mentioned that values are involved with an individual’s attitude; they are more stable over time and at the core of an individual’s cognitive system. Thus, due to their centrality and stability, values can be named predictors of an individual’s behavior.

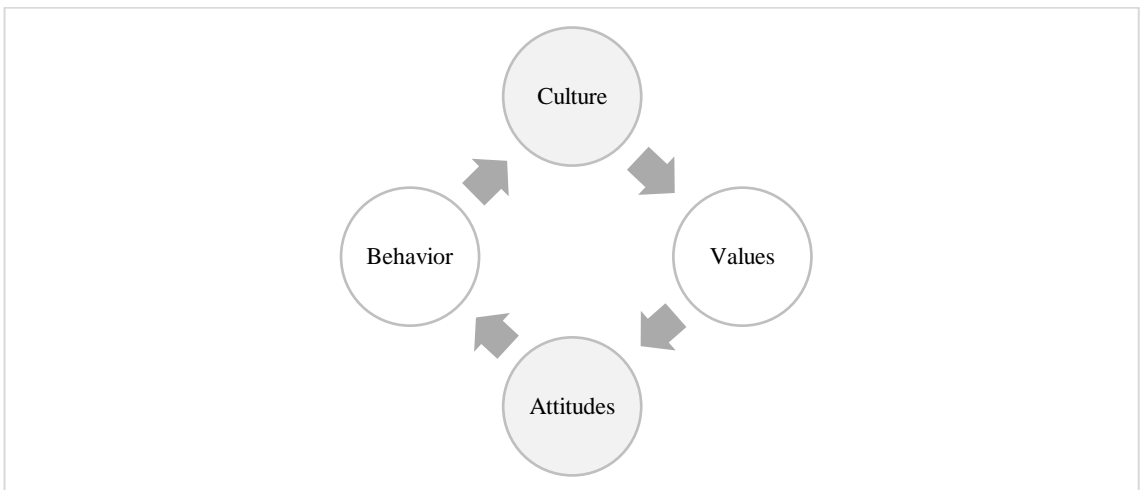


Figure 2: Influence of culture on behavior (adapted from Lloyd, 2003).

Another perspective refers to Schein’s cultural levels: Artifacts, Espoused beliefs and values, and Underlying assumptions (Schein, 2010). Chydenius, based on three levels of culture (outer, mid, and inner), indicated the relationship between culture and behavior in level two, as specified in Figure 3, and he discussed culture’s influence on behavior (Chydenius, 2020).

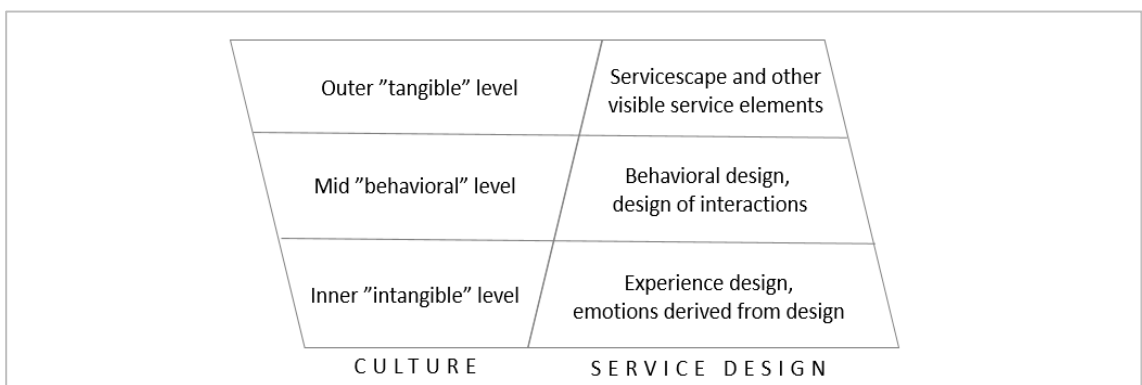


Figure 3: The relation of culture with cultural levels, and cultural levels with service dimensions (adapted from Chydenius, 2020).

Culture, Persuasive Service Design, FBM

Furthermore, the connection of behavior, attitudes, and culture is the focus of many other domains, and design is no exception. The discussion of design with a psychological approach has achieved spectacular concepts and paradigms, persuasive design is one of them. Analyzing people's motives behind their choices to engage in behavior can develop the design with the intention of addressing users' needs and expectations. Some researchers argued that beliefs and attitudes are partners, as well as have an intentional direct link with individual's behaviors. In other words, considering beliefs and attitudes as culture's components, these components have the ability to create intentions or motivations for persuading someone to act in a particular behavior (Yocco, 2016; Figure 4).

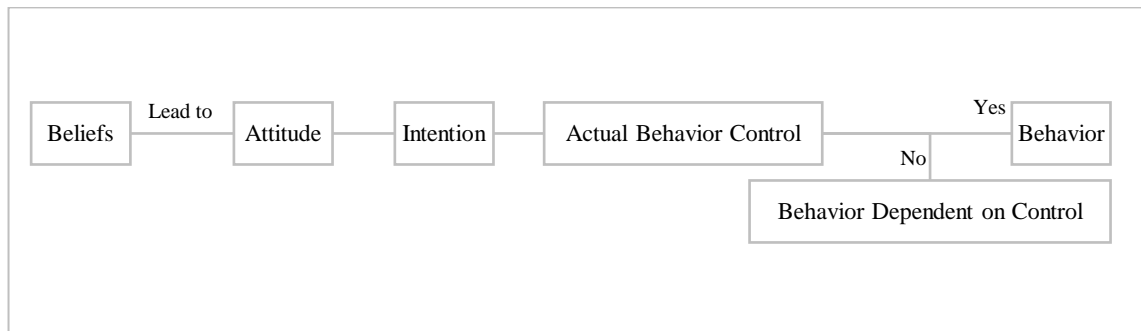


Figure 4: Components of a planned behavior (adapted from Yocco, 2016).

While the concept of persuasion can sometimes encompass a range of meanings. Brian Jeffrey Fogg, an American social scientist, explained human behavior in his famous Fogg model (FBM). FBM shows that three elements must converge simultaneously for a behavior to occur: Motivation, Ability, and Prompt. When a behavior does not occur, at least one of those three elements is missing. He defines the model as an attempt to shape, reinforce, or change behaviors, feelings, or thoughts about an issue, object, or action (Khaled et al., 2006).

Fogg explained the components of FBM as:

- Core Motivators: A framework for motivation that has three core motivators, each with two sides. Pleasure/pain, hope/fear, and social acceptance/rejection.
- Simplicity Factors: Whatever makes the behavior easier to do.
- Behavior Triggers: A trigger is something that tells people to perform a behavior now.

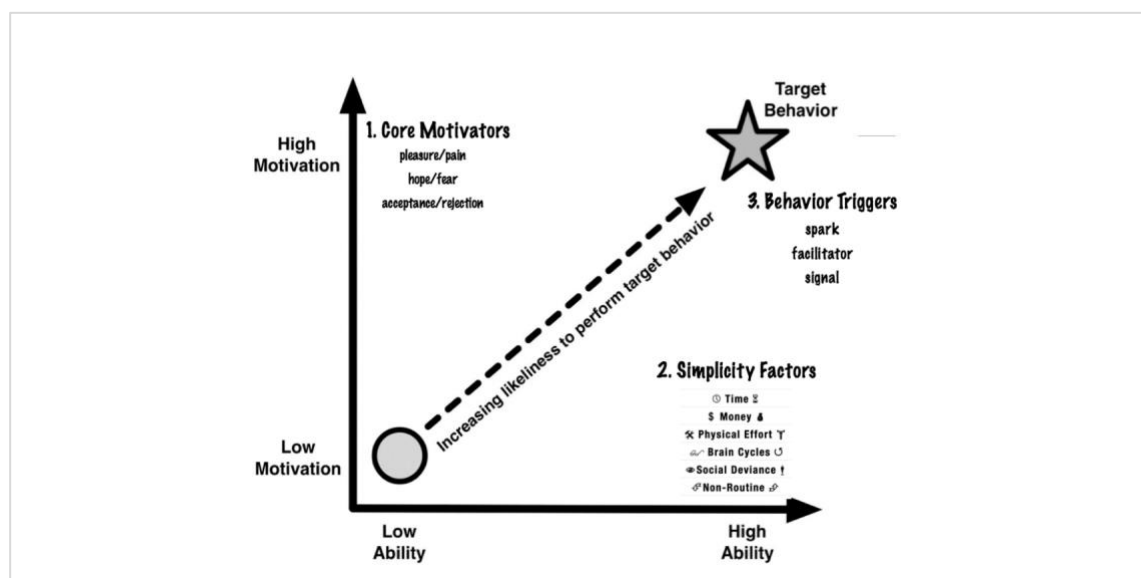


Figure 5: All three factors in the Fogg Behavior Model have subcomponents (adapted from Fogg, 2009).

FBM is known as a proper systematic way to analyze the design of persuasive technologies and services. The framework is a conceptual model with strength in elaborating relations of its components while still depriving of their precise values and the underlying factors of behavior changes (Fogg, 2009; Khaled et al., 2006). Later, Fogg, Oinas-Kukkonen, and Lockton suggested different ways to design persuasive services (Won, 2018). Oinas-Kukkonen and Harjumaa further categorized three types of influence that persuasive technologies can have on people's attitudes or behavior: reinforcement, change, and shaping (Lu et al., 2021).

While design decision-making on persuasive service design is generally shaped by designers' judgments and their perceptions of users' needs, in FBM, these assumptions can be more accurate through the model components and analysis. Persuading people within their cultural framework is more accessible than inciting them to new behavior in a large-scale cultural change (Khaled, 2008).

Research Area, Research Aim

According to FBM and the further findings of other experts in the field of persuasive design, this research focuses on the second influence, change. First, the authors attempted to find a specific habit that has been transformed from old to new through a digital service, for instance, online doctors, online organic products, digital self-care services and etc. Second, among all the subjects, the habit of reading is chosen as the main subject for investigation. In this matter, the old habit of reading physical books is compared with the new habit of the e-book in some selected aspects. The idea of the role of culture in changing behaviors through digital services is narrowing down to reading e-books.

The aim of this research is to investigate the role of culture in changing behavior through digital services; therefore, it will answer the relationship between the culture and changing an existing behavior to a target behavior while using a digital service. The hypothesis can be stated as follows; Users with a familiar cultural background of a specific habit are more welcome to accept a new habit through a digital service.

Methodology

This research is exploratory in nature, an attempt to clarify some factors of changing an old habit to a new one through digital services with a cultural approach. It tries to understand the existing situation of changing habits but does not provide specific results or solutions (QuestionPro, 2018). This exploratory research consists of a mixed method. First, based on FBM (Which is explained under the title of *Culture, Persuasive Service Design, FBM*), three existing and three target behaviors related to reading were selected. Twenty bipolar attributes were chosen as the subdomain of FBM components. Ten pairs of bipolar attributes were finalized in a meeting with four expert design researchers. An online questionnaire was designed and the sampling method was snowball; therefore, the online questionnaire was sent to multiple groups and individuals and they were asked to send it to whom they may be interested. After four days, 81 participants answered the questionnaire.

Data Collection

The method for collecting data in this research is Repertory Grid Technique (RGT). RGT is an interview-based technique that extracts personal constructs related to a set of objects purposely (Hassenzahl & Trautmann, 2001). The technique can be used both for qualitative and quantitative research; the subjects in this technique are people when it is done in its usual field. In design research, subjects can be replaced with products or services. The RGT application process consists of two major phases; contrast elicitation by comparing the elements and rating them on the elicited constructs (Kuru, 2015).

Since this research requires more than 10 participants for habit comparison, the questionnaire was online. Due to the online platform and the interview nature of the method, written instruction followed by a test question was designed to collect reliable data. The authors outlined ten main questions with the chosen bipolar constructs (adjectives related to reading in this research).

In other words, the first question was for the validity check, and the following ten questions were the primary data gathering. The questionnaire starts by asking participants the following questions; their gender, the average time they spend reading per day (Table 1), and the test question. The test question asked their opinions on scoring five ingredients from sweet to bitter (as construct), and the scoring taste of honey, rice, coffee, yogurt, banana, and tea were the questions. Authors used www.epoll.pro as the leading platform for designing online questionnaires, and the platform provides automatic data collecting with some features.

In each question, participants were asked to score six elements based on five points scoring. The six repetitive behavior are elicited elements (Table 2), and the ten bipolar phrases are the elicited constructs (Table 3). The survey is intentionally designed to divide the participants into two groups those who read more than an hour a day (intellectual readers) and those who read less (casual readers). The average time of reading is the independent variable in this survey.

Table 1: *Independent variable.*

Reading time	
Less than an hour	More than an hour

Table 2: *Dependent Variable and elements.*

Existing behaviors	Target behaviors
Reading physical books	Reading E-books
Library and book shelves	Virtual library
Purchasing books from bookshop	Online E-book purchasing

Table 3: *Constructs for questionnaire (extracted based on FBM component).*

Left pole	Right pole	FBM components
Symbolic	Non symbolic	Core motivator
Easy to do	Hard to do	Simplicity factor
Attractive	Boring	Core motivator
Easy to access	Hard to access	Simplicity factor
Satisfactory	Unpleasant	Core motivator
Simple	Complicated	Simplicity factor
Economical	Expensive	Simplicity factor
Independent	Dependent	Behavior trigger
Environmentally friendly	Environmentally unfriendly	Behavior trigger
Easy to categorize	Hard to categorize	Simplicity factor

As the central question of this survey is to compare whether the intellectual readers (reading as a behavior and a cultural attitude) have more potential to accept digital reading (as a target behavior) or not, the RGT method is applicable. The analysis of RGT may draw how effective are ten persuasive factors in changing one's old behavior into a new target behavior.

Data Analysis

First, three data types were extracted from questionnaires, including gender, age, and average reading time. Then, 81 questionnaires were divided as mentioned before. Group A consisted of participants with less than an hour of reading per day, and Group B included those who read more than an hour a day. Meanwhile, Group A considered casual readers characterized as users with an absence of underlying background, hence regretting the new habit of reading e-books; and Group B, considering intellectual readers, tend to encourage the change of reading habit in a more welcome manner.

Afterward, the invalid questionnaires were removed from Groups A and B. The indicators for invalidating a questionnaire were:

- Incorrect or irrational answers to the first test question
- Similar scores for two or more questions in a row
- Answering duration less than 6 or more than 30 minutes

Fifty-two valid questionnaires were selected for the study, 19 men and 33 women. The remaining data is sorted in the Repertory Grid matrix for each group.

For studying the final data for RGT, a demonstration of an RG matrix was required. The final matrix for each group was created by calculating the Mode statically. Finally, the extracted data were analyzed separately for Groups A and B and their comparison. Excel version 2016, Idiogrid version 2.4, and Rep Plus version 2 were used for analyzing data.

Results and Discussion

Analyzing 52 questionnaires is illustrated in [Table 4](#).

Table 4: *Participants' demographic information.*

Categorize	Frequency	Valid number
participants	81(100%)	52(64%)
Gender		
Men	38(47%)	19(36%)
Women	43(53%)	33(64%)
Groups		
A (less than one hour)	26(100%)	26(100%)
Men	4(15%)	4(15%)
Women	22(85%)	22(85%)
B (more than one hour)	26(100%)	26(100%)
Men	15(57%)	15(57%)
Women	11(43%)	11(43%)

The data of each group was analyzed separately, and the results elaborated as follows:

1. A display Repertory Grid as a representative of 26 RG for each group which was created by the Mode of each data set ([Figures 6 and 7](#)). Elements are below the grid, and the poles of the constructs are on either side of the grid ([Persson, 2009](#)).
2. In A cluster analysis ([Figures 8 and 9](#)), [Persson \(2009\)](#) stated that the order of the elements and the constructs changed in compression with display RG, and the new order reflects the differences and similarities in the rating of the elements and the constructs, and two dendrograms for elements and constructs are subsequent and under the table.
3. Focus data tables consist of Element Matches, Element Links, and Construct links. Indeed, these tables are fruitful for interpreting cluster analysis ([Figure10 and 11](#)).

The first outline results of each group are the display repertory grid, which includes elements, construct poles, and element scores related to its construct. The matrix included six elements and ten constructs ([Figures 6 and 7](#)). Genuinely, elements are the existing and target behavior, and the construct poles are the FBM models. In each matrix, elements are paired as target and existing behavior and depicted side by side. The columns related to 1-2, 3-4, and 5-6 elements are compared to examine the similarities and differences.

The distinction between the assigned numbers explains the amount of resemblance and disparity between the two behavior of the construct listed in the row. Inspecting and comparing rows results in the amount of differentiation or similarities of the constructs.

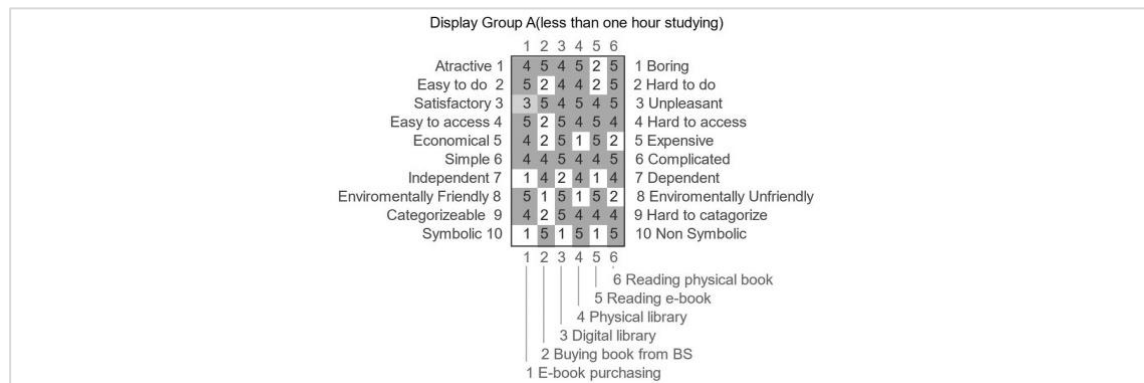


Figure 6: Display repertory grid for Group A.

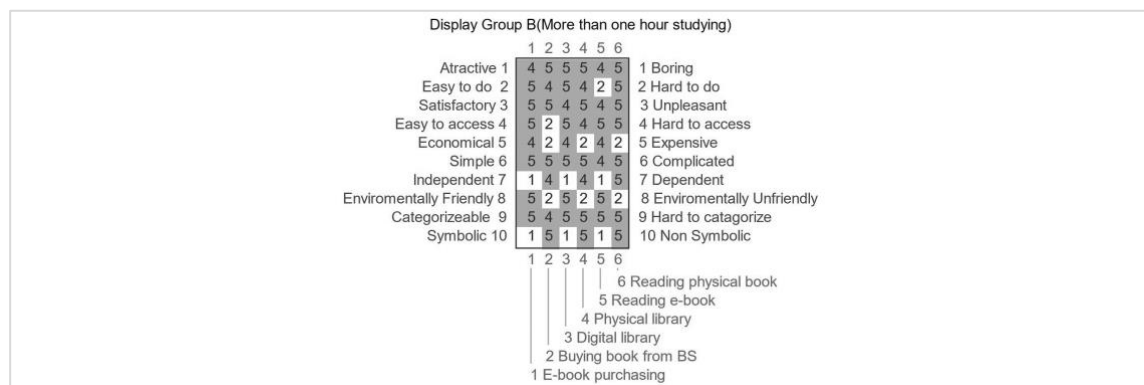


Figure 7: Display repertory grid for Group B.

In the Focus Cluster analysis, the arrangements of constructs and elements changed by the order of display repertory grid as a consequence of placing similar elements and constructs next to one another. The analysis is shown in figures 6 and 8; in Group A the similarities in percentage are; 4 and 6 clusters- 90%, 1 and 3 – 85%, 3 and 5 - 82%, 4 and 2 - 82%, and 1 and 6 – 57%. The most similarity of clusters in this group is for 8 and 10, with 95% resemblance, and the least similar clusters are 1 and 6, with 57%. On the other hand, in Group B, the likeness results are: 1 and 3 – 95%, 4 and 6 – 92%, 4 and 2 – 92%, 1 and 5 – 87%, and 6 and 3 - 65% with the minor similarity, 8 and 7 are the closest. In clusters comparison, the highest percentage of similarities is between 7 and 8 with 95%, and 2 and 4 are the least similar with 83% similarity.

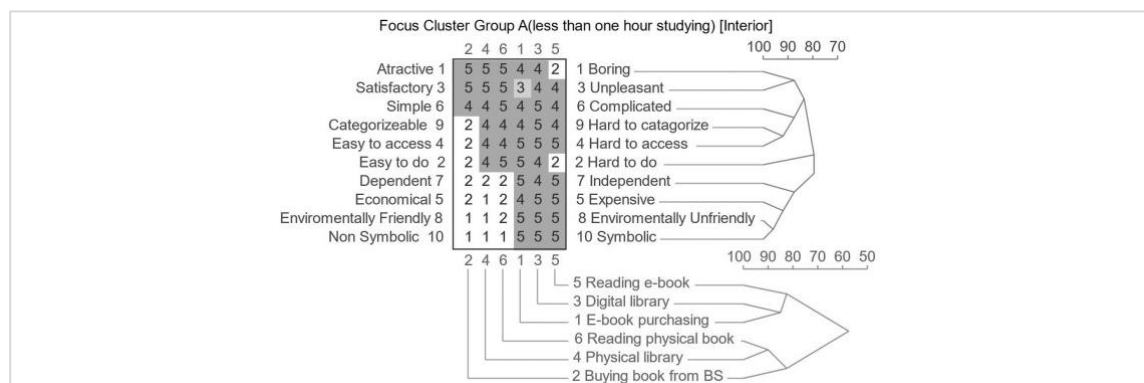


Figure 8: Focus Cluster for Group A.

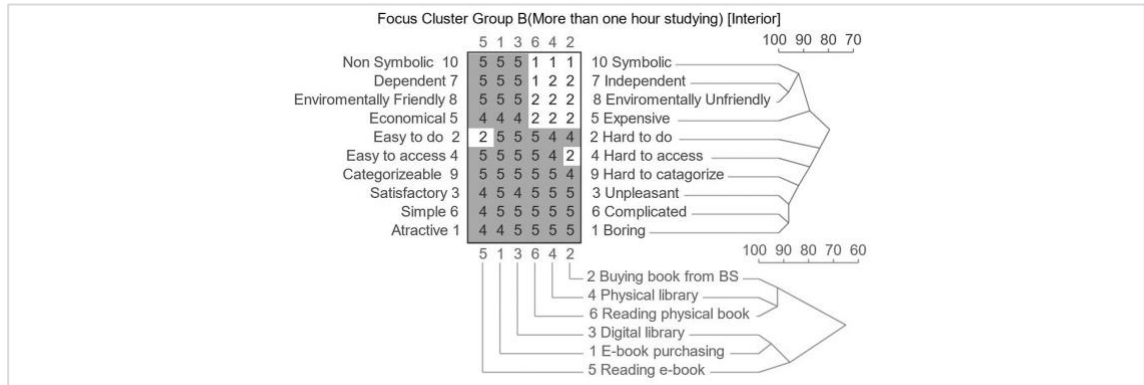


Figure 9: Focus Cluster for Group B.

The following results are related to Focus Data for each group. In Figure 10 and 11, the *element matches* show the resemblance relations of elements with one another. *Element links* and *constructs links* explain the cluster's likeliness and the amount of percentage of the same quality. In the *elements matches*, the numbers are polar symmetric. It is worth mentioning that in Group A, 1 and 2 are the most similar with 90% and 1 and 2 are the least similar with 40% similarity. These numbers for Group B are 3 and 1 – 95%, and 2 and 5 - 48%.

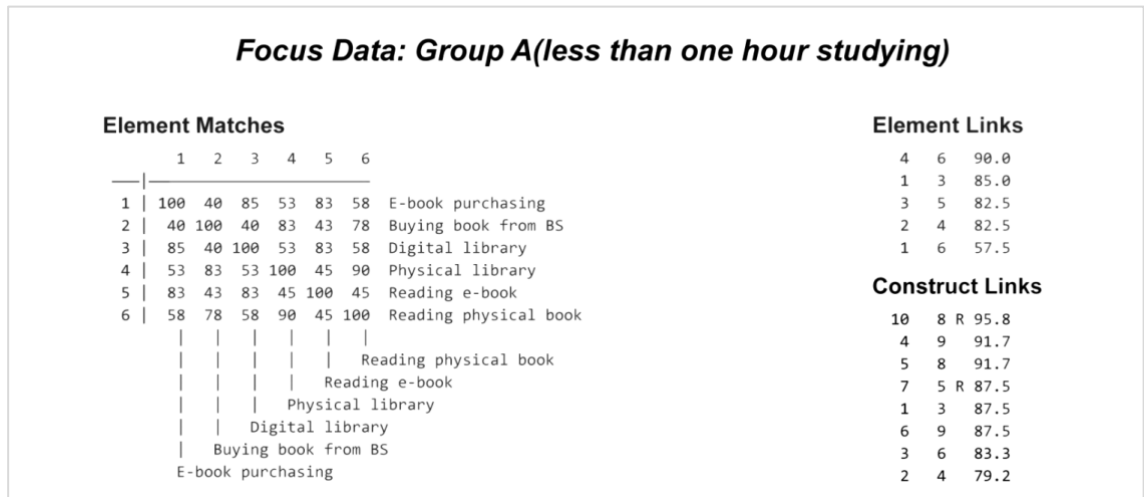


Figure 10: Focus data table for group A.

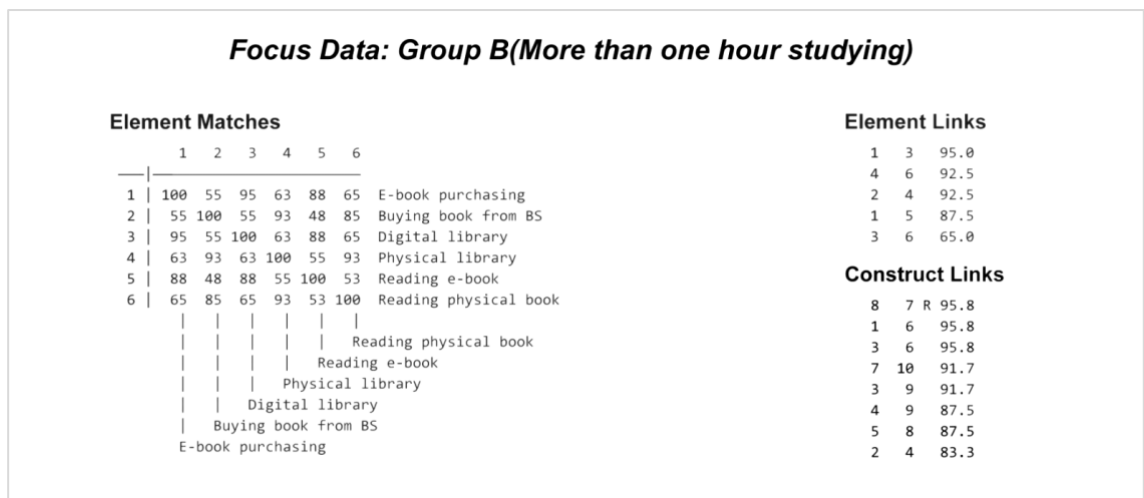


Figure 11: Focus data table for group B.

Ultimately, according to the hypothesis and research aim, the discoveries of the research can be illustrated in [Tables 5, 6, and 7](#). Further research on similarities and differentiations of the clusters regarding the survey outcomes can be expanded in other research.

Table 5: Existing behaviour similarity.

Existing behavior		Similarity in group A	Similarity in group B
Buying book from Bs	Physical library	93%	83%
Buying book from Bs	Reading physical book	85%	78%
Reading physical book	Physical library	93%	90%

Table 6: Target behaviour similarity.

Target behavior		Similarity in group A	Similarity in group B
E-book purchasing	Digital library	83%	88%
E-book purchasing	Reading E-book	78%	85%
Reading E-book	Digital library	83%	88%

Table 7: Existing and target behaviour similarity.

Existing behavior	Target behavior	Similarity in group A	Similarity in group B
Buying book from Bs	E-book purchasing	40%	55%
Physical library	Digital library	53%	63%
Reading physical book	Reading E-book	45%	53%

Conclusion

In this research, the authors attempt to understand how individuals' cultural background and underlying motives can affect their interactions with digital services. The average reading time is considered a habit for participants, and the survey results indicate that those who read more than an hour daily are more enthusiastic about new digital services covering their demands. Hence, the average reading time was considered a cultural element regarding FBM. The distinction between Groups A and B was the duration of daily reading. Results concurred that Group B experience combability and adaptability to enroll in new digital book services. In other words, it outlines the acceptance of the hypothesis. In addition to the findings, Group B achieve a higher score and higher similarity percentages in the same existing behavior ([Table 5](#)). [Table 6](#) compares the target behavior, emphasizing that reading is a daily habit for Group B.

This paper indicates that; Cultural background of users is initial in launching a service; in other words, those users with a familiar cultural background of a specific habit are more welcome to accept a new habit by a digital service. There are potentials for further research regarding the survey, such as the time each participant spends answering the questionnaire, a psychological test for better understanding, and the division of users to analyze the data with a psychological approach.

Intentionally, dividing the participants into two groups by the amount of time they spent reading can be the delimitation of this research. Further research on topics of service design and reading habits and other aspects of culture for an independent variable can complete the discovery of this paper.

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