

User Adaptive Web Morphing: An Implementation of a Web-based Bayesian Inference Engine with Gittins' Index

by

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Abstract

Imagine a world where computers are able to present desired information to people in the most relevant and effective way possible, where machines are able to adapt the way they interact with humans when they encounter different personality styles. Web Morphing captures the essence of this idea and applies it to realm of Digital Marketing, allowing companies to present product information in a manner in which the consumers are most comfortable with. By using user click-history, a Website with Morphing capability can display its information based on the user's inferred Cognitive and Cultural Styles. This thesis documents the process of building the Mathematical Inference Engine of a Web Morphing System that gives a Web site the ability to adapt itself to individual users. First, I will briefly discuss the history and motivation of Morphing. Then, I will discuss the theory of Morphing from the work of Hauser, Urban, Liberali, and Braun, and I will give a system overview of the Web Morphing System. The main contribution of the thesis is the technical implementation of the Mathematical Inference Engine, and I will describe in detail the construction of Mathematical Inference Engine's two major parts: the Bayesian Inference Engine, and the Gittins' Index Engine.

Thesis Supervisor: Glen L. Urban
Title: David Austin Professor of Management Science
Chairman, MIT Center for Digital Business

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Chapter 1

Introduction

1.1 Thesis Scope and Outline

The contribution of this thesis is to document the PHP implementation of a scalable Mathematical Inference Engine used for user adaptive morphing Web sites. This Mathematical Inference Engine is important because it allows Web sites to have the ability to infer the Cognitive and Cultural Styles of site visitors, and therefore have the ability to dynamically customize the content on the Web site according to each unique user. In addition, inferring Cognitive and Cultural Styles is just the beginning; the system has the ability to take into account the amount of time a user spends on a Web site. The power of this system is that, with proper modification, it can be expanded to infer other types of information as well. Companies such as General Motors have already expressed strong interest in using this technology to reach customers more effectively, and initial simulations and empirical tests have shown promising results in gaining market share through the adoption of this technology [2].

In chapter 2, I will explain the concept and the history of Web site Morphing. The idea of Web site Morphing is derived from Professor Glen Urban's philosophy of Trust Marketing and Customer Advocacy. I will give an overview of what Trust Marketing is, and also give an example of the online advisors that were developed from past Trust Marketing research projects.

In chapter 3, I will give an overview of the Morphing Theory from Hauser, Urban,

Liberali, and Braun [2]. In addition, I will describe the various design parameters that serve as the inputs into a user adaptive Morphing Web site. Furthermore, I will give an overview of the statistical and optimization algorithms that are used to build the Mathematical Inference Engine that consists a major part of the Morphing Web System. I will describe the idea of Bayesian inference and a Gittins' Index. Lastly I will describe the methodology used to calibrate the Morphing Web site.

In chapter 4, I will describe the Morphing Web System. A Morphing Web System consists of three major parts: the Graphical User Interface, the Content Management Engine, and the Mathematical Inference Engine. I will explain how each of these components interact with each other and give an overview of what each component should do.

In chapter 5, I will explain the technical details of the Mathematical Inference Engine. This is the main contribution of my thesis. The Mathematical Inference Engine consists of two main subsystems, a Bayesian Inference Engine and a Gittins' Index Engine. In this chapter, I will describe in detail how the statistical and optimization algorithms from chapter 3 are implemented in PHP for both the Bayesian Inference Engine and the Gittins' Index Engine. Additionally, I will describe how the system takes into account of the amount of time each user has spent on the Web site using the Weighted Morphing Algorithm. Lastly, I will describe the technical challenges I faced in implementing each part of the system.

In chapter 6, I will describe the contribution of this thesis, and conclude with a discussion on ideas for future research, both in the domain of Marketing Literature and Computer Science.

Chapter 2

Background

In this chapter, I will describe the history of morphing. Professor Glen Urban, the Principal Investigator of the Web Morphing Project, became interested in Web Morphing after his earlier works with Trust Marketing and Consumer Advocacy. I will briefly describe the ideas of Trust Marketing and online advisors, and how these projects evolved into the Web Morphing Project.

2.1 Trust Marketing

Whenever one thinks of marketing, an image of a pushy salesman, clad in a slick suit comes to mind. In the days of traditional marketing, it was believed that the more effort one spends in promoting a product, the better the product will sell. This “Push Method” worked, over the past several decades, since it adds value to the customer by providing them with new information. However, the advent of the World Wide Web kicked off a new age of information access. With this powerful tool, for the first time in human history, consumers have a wealth of the world’s information at their fingertips. For businesses around the world, this means that pushing products onto well-informed customers will not attract but rather drive them away in disgust.

Professor Glen Urban at the Sloan School of Management, expert in new product development and marketing, is promoting a different approach - trust. His theory of Consumer Advocacy and Trust-Based Marketing encourages companies to advocate

for the consumers and gain their trust as a first priority. The Consumer Advocacy Theory goes beyond the traditional “Push Method” or even the rather new Customer Relation Method. At the heart of the model is a quality product. Building on top of that is the philosophy that it is important to inform customers with unbiased information about one’s own product and the competition as well, in a way that maximizes consumer’s value. Figure 2-1 illustrates the necessary components in building Customer Advocacy [6].



Figure 2-1: Customer Advocacy Pyramid

Since delivering unbiased information to the customer is at the basis of this theory, what better way than to do it with the Web itself? For the past couple of years, Urban has collaborated with major Fortune 500 companies in testing this theory out on consumers. Past sponsors include Intel, British Telecommunications, and General Motors.

2.2 Online Advisors

The concept of online advisors stems from the idea of Trust Marketing. An online advisor is a virtual persona that allows customers to explain their preferences and

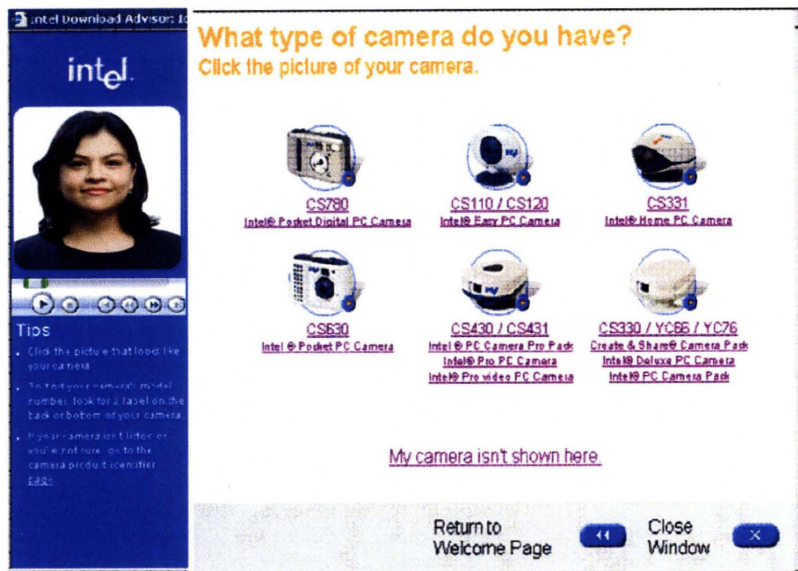


Figure 2-2: Rosa, an example of an Online Advisor from the Intel Project

in return, receive customized advice and recommendations on products that fit these preferences the best. Figure 2-2 is an example of an online advisor from a previous Advocacy research project with Intel Corporation.

2.3 Web Site Morphing

A Morphing Web site is one that can change the way it displays information on-the-fly, according to the type of customer is viewing the Web site. A Web site, much like a book, is just a medium for exchanging information. If one were to go to the local bookstore looking for a book about cars, one will see various different types of books, ranging from technical manuals to picture books. The main difference between these car books is not in the content, but rather the way which the content is delivered. Each of these books was designed with a different audience in mind. The technical manual is filled with jargon and specifications that can only be understood by an expert who is receptive to the technical language, and the picture book is favored by a car admirer who may not know much about a car's technical details. Now imagine if one were to get a hold of a magical book that can change from a technical manual

to a picture book when it detects that the reader is not the technical expert, but rather a car admirer. This is the idea behind Web Morphing.

Chapter 3

Morphing Theory

In this chapter, I will describe the motivation of morphing and the various design parameters that need to be considered before building a Morphing Web System. Additionally, since this thesis will focus on the Mathematical Inference Engine, I will briefly describe the mathematical theory of Morphing found from the work of Hauser, Urban, Liberali, and Braun [2].

3.1 Motivation

Adapting one's communication style to different listeners is not a new idea, and we as human beings do it everyday. Whenever you speak to a different person, you pick up clues from his or her voice, facial expressions, style of dress, and body language, to adapt the way you deliver your ideas. The end goal is to deliver your idea in a meaningful and interesting way so that the idea is disseminated and retained.

For instance, imagine the situation where you were to present the idea of a new way to build a computer system to an engineering professor. You would speak in a concise, effective format with a healthy dose of technical terminology that can deliver the message in the most efficient, meaningful way as possible. In addition, you would probably focus on what is the technical contribution of this new method of building the computer system and why this contribution is important. Now, let us evaluate another situation. Imagine yourself at a little league baseball game and

you happened to strike up a conversation with a middle-age mother. If you were to explain to her your idea in the same technical, concise way that you would to the engineering professor, you would probably lose her attention very quickly. This is because the technical method of delivery does not address the questions that she cares about. As an end-user, she probably cares more about how this can make her life easier and whether this new way of building can cut the price on her new laptop. Unless she is technically trained herself, she probably does not care for the technical contribution.

Web Morphing is our attempt to teach computers to do the same thing. Imagine a future where Web sites will be able to help consumers intelligently by giving them the information that they seek in the quickest and most meaningful way was possible. The tremendous success of companies such as Google has proven that the public desire useful information, and they want the information as fast as possible. We will draw upon research from various fields in Computer Science, Artificial Intelligence, Statistics, and Management Science to build our system, and to make our contribution towards that vision.

3.2 Morphing System Design Parameters

In order for Web Morphing to help the customer, there has to be a defined way of interaction between the human user and the computer system. The main input to this system will be the user's mouse clicks. This is a natural choice because a majority of the interaction between people and Web sites are through mouse clicks. In addition to deciding which inputs the system will use, it is imperative to decide how to define the categories in which the system will use to classify the user by. For this implementation, we will morph the Web site according to the Cognitive and Cultural Styles of a customer.

The next step is to design the different morphs of a Web site according to each of the possible combinations of user styles. Once the Web site is designed, then you could determine, using methodologies that will be mentioned later in the paper, which types

of users will most likely click on certain links. These values will serve as tags for each link to act as inputs into the Inference engine. Hence, from a collection of the click history, the inference system will be able to infer the Cognitive and Cultural styles of the user by calculating the probabilities that a user is in a particular Cognitive and Cultural Style segment.

Hence, there are three main design issues that must be considered before building the Morphing engine:

1. Population Segment Variables: Cognitive and Cultural Styles
2. Web site Characteristics and Morphs
3. Mapping the Relationship between Styles and Morphs

3.2.1 Population Segment Variables: Cognitive and Cultural Styles

An important step in building a Morphing Web site is to determine how many different types of population segments a Web site should cater to. There are many ways to divide a population up into segments, including socioeconomic factors such as location, age, and wealth. We decided to approach this from a psychological perspective, by dividing users according to their cognitive styles. From background research in, we found that human populations could be divided up according to three different cognitive dimensions: Graphical versus Verbal, Deliberative versus Impulsive, and Analytic versus Holistic[4].

We ran an initial market test in Great Britain with an implementation of a fixed-morph Web site for British Telecommunications in January, 2007 to test the viability of Morphing by Cognitive Styles. The results show that Morphing to Cognitive Styles matters[2]. By conducting Factor Analysis on individual-level responses to cognitive scales in a questionnaire, we found that the analytic versus holistic dimension is highly related to the graphical versus verbal dimension. From John Hauser's Factor

Analysis, we decided to merge these two dimensions for future studies. For the results of the factor analysis, please refer to the Appendix.

For details on the background research on the Cultural Styles, please refer to the document prepared by Antonio Lorenzon and Harald Solamann, listed in the Appendix Chapter “British Telecommunication Project Documents.”

For the Suruga Card Loan Web site Study, we have decided to initially design the Web site for the following dimensions:

Cognitive Dimensions	Cultural Dimensions
Analytic/Visual vs. Holistic/Verbal [AH]	Individualistic vs. Collectivistic [IC]
Deliberative vs. Impulsive [DI]	Hierarchical vs. Egalitarian [HE]

Table 3.1: Suruga Cognitive/Cultural Dimensions

3.2.2 Web site Characteristics and Defining the Morphs

It is very important not to confuse the Web site Characteristics with the Cognitive/Cultural Styles of a customer. Web site characteristics are the design dimensions in which we use to build a Web site. These characteristics dictate how a Web site should look and feel, especially with how the information is delivered on the Web site.

For a complete list of Web site characteristics all of the Morphing Web site prototypes, please refer to Appendix A.

For the BT Web site, there are a total of three binary characteristic dimensions. The combination of each of these three dimensions is called a *morph*. For the BT Web site, there are a total of 2^3 possible morphs. Figure 3-1 shows the differences between two drastically different morphs.

It is imperative to understand that a morph is simply a different way of delivering the same information. For instance, the two pages in figure 3-1 both deliver information about competitive broadband plans. The differences come from the fact that one is delivered in a graphical, long and technical format, with audio options while the other, does so in a general, succinct format without audio.

For a list of all of the Cognitive and Cultural Style dimensions used in both the

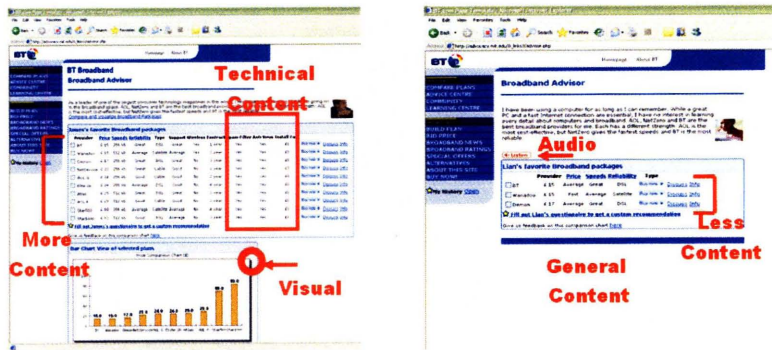


Figure 3-1: Illustration of 2 different morphs from the BT Morphing Web site.

BT Morphing Web site and Suruga Morphing project, please refer to the Appendix.

3.2.3 Mapping the Relationship Between Styles and Morphs: The Ω Matrix

The purpose of the Ω Matrix, also called the estimated preference weights, is to map the relationship between a user's Cognitive and Cultural Style with the Web site morph that the user has seen. The decision to separate the Cognitive/Cultural Styles from the Web site Characteristics came from that the observation that it is nearly impossible to design a Web site morph that fits perfectly to a define Cognitive or Cultural Style. Hence, in order to keep the system scalable, where we can change the Cognitive and Cultural dimensions for the system at anytime, Urban, Hauser, Liberali, and Braun decided to separate the two parameters, and to link them by estimating the relationships between both parameters after they are determined [2]. The description of the Ω Matrix and the procedure for estimating it can be found in the Appendix. Figure 3-2 describes the need to identify the relationship between a user's Cognitive Style and a Morph's characteristics.

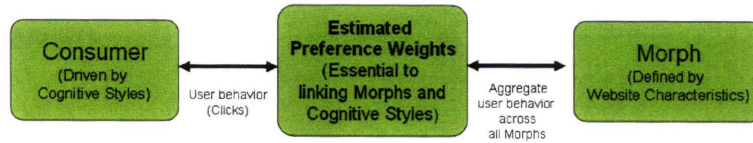


Figure 3-2: Illustration of the role of the Ω Matrix

3.3 Mathematical Theory of Morphing

In this section, I will summarize the mathematical models found in the paper “Website Morphing” by Hauser, Urban, Liberali, and Braun. The purpose of these models is two-fold[2]. First, the models use the information from the mouse clicks of each individual user to infer his or her Cognitive and Cultural Styles. Then, given that information, the models assign the optimal morph to the user. The models that deduce information from the user clicks is belong to the Bayesian Inference Loop, and the models that assign the optimal morph to the user belong to the Dynamic-Programming Inference/Optimization Loop, as shown in figure 3-3.

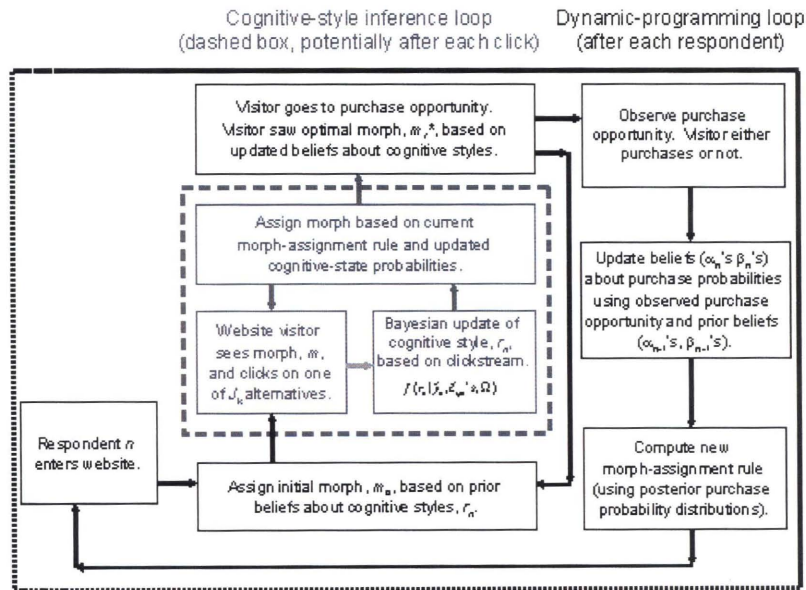


Figure 3-3: Overview of Morphing Theory[2]

3.3.1 The Bayesian Inference Loop

The purpose of the Bayesian Inference Loop is to infer the Cognitive and Cultural styles of the user by using Bayes' Theorem. This is done so by inferring two quantities:

1. $f(\vec{y}_{kn} | \vec{c}_{kjn}, r_n, \Omega)$ - the probability that the system observes a given click from a user.
2. q_{rn} - the posterior distribution that a user belongs to each Cognitive and Cultural Style segments.

These two quantities are defined by equations 3.1 and 3.2.

$$f(\vec{y}_{kn} | \vec{c}_{kjn}, r_n, \Omega) = \prod_{j=1}^{J_k} \left(\frac{\exp[\vec{c}_{kjn} \cdot \vec{\omega}_{r_n}]}{\sum_{l=1}^{J_k} \exp[\vec{c}_{jln} \cdot \vec{\omega}_{r_n}]} \right)^{y_{kjn}} \quad (3.1)$$

Equation 3.1 represents that, in any particular Web page with J_k click alternatives, the probability the system observes a given click y_{kjn} for the n th user is described by $f(\vec{y}_{kn} | \vec{c}_{kjn}, r_n, \Omega)$. The \vec{c}_{kjn} are the link description values of the Web site characteristic of the destination from the link that user clicks on. $\vec{\omega}_{r_n}$ represent the quantity of the preference weights of a user. This includes both the estimated preference weights, the Ω Matrix, as well as r_n , the Cognitive and Cultural Style segment of a user. The model uses a multinomial logit function to model the probability that a user would choose a particular link out of the J_k options. Note that the quantity y_{kjn} is a binary variable that can take on the values 1 or 0.

$$q_{rn} = f(r_n | \vec{y}_n, \vec{c}_{kjn}, \Omega) = \frac{\prod_{k=1}^{K_n} \prod_{j=1}^{J_k} f(\vec{y}_{kn} | \vec{c}_{kjn}, r_n, \Omega) q_o(r_n)}{\prod_{k=1}^{K_n} \prod_{j=1}^{J_k} \sum_{r_o=0}^{15} f(\vec{y}_{kn} | \vec{c}_{kjn}, r_n, \Omega) q_o(r_n)} \quad (3.2)$$

Using Bayes' Theorem, equation 3.2 describes the posterior distribution of a user in each Cognitive and Cultural Styles given $q_o(r_n)$, the prior belief about the user, and $f(\vec{y}_{kn} | \vec{c}_{kjn}, r_n, \Omega)$, the probability of observing a given user click. Note that the summation in the denominator is from 0 to 15, which represents the total number

of possible Cognitive/Cultural Styles segments is 16. However, this number could change if the number of Cognitive and Cultural Styles dimensions is different.

3.3.2 The Dynamic Inference/Optimization Loop: The Gittins' Index

The purpose of the Dynamic Inference/Optimization Loop is to give the system the ability to learn to find the optimal Morph for any users. The solution to this dynamic programming problem is called the Gittins' Index[2]. The system uses the Gittins' Index to learn overtime what the best morph to serve for users from each Cognitive and Cultural Style segments. EG_{mn} , the Expected Gittins' Index, for all morphs m for user n is given in equation 3.3.

$$EG_{mn} = \sum_{r=0}^{15} q_{rn} G_{rmn}(\alpha_{rmn}, \beta_{rmn}) \quad (3.3)$$

EG_{mn} is a vector containing the Gittins' Indices for all m morphs, and the system serves the morph that has the greatest $G_{rmn}(\alpha_{rmn}, \beta_{rmn})$, the Gittins' Index.

For more information about the mathematical models, please refer to the paper "Website Morphing" by Hauser, Urban, Liberali, and Braun [2].

Chapter 4

Morphing Web System Overview

4.1 System Overview

In this chapter, I will describe the entire Morphing Web System from a system's point-of-view.

The entire Web Morphing System can be broken down into three main parts: the front-end Graphical User Interface (GUI), the Content Management Engine, and the Mathematical Inference Engine, as shown in figure 4-1.

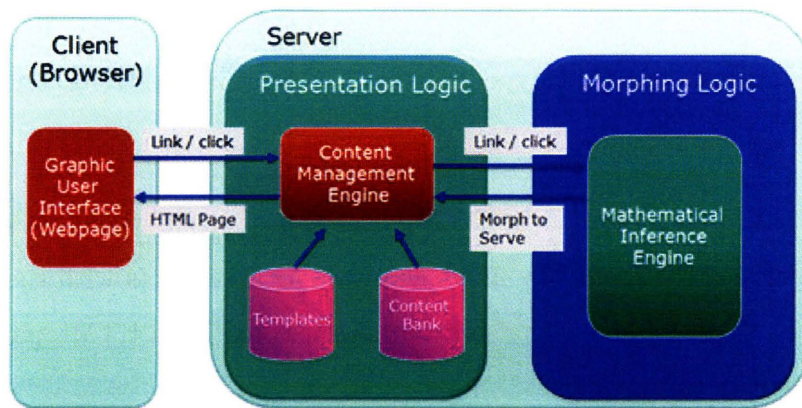


Figure 4-1: Morphing System Overview

I will briefly describe the purpose of these three parts, and I will finish the chapter by describing the calibration methodology of this system once it is built.

Since this thesis focuses on the Mathematical Inference Engine, I will describe the

details of implementing this portion in Chapter 5.

4.2 The Graphical User Interface and System Backbone

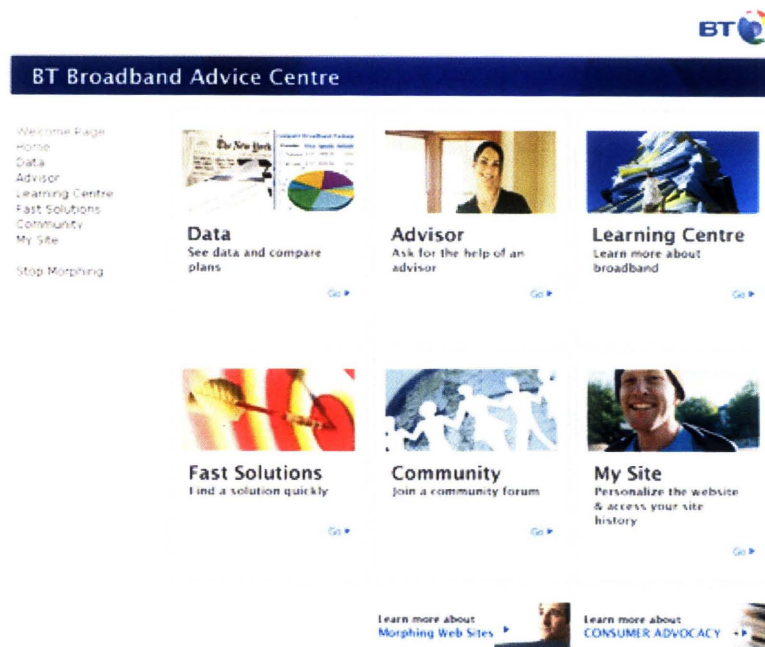


Figure 4-2: Screenshot of Prototype 2 of the BT Morphing Web site, an example of the Graphical User Interface

The Graphical User Interface is the HTML webpage itself, as illustrated in figure 4-2. This serves as the main way in which our system interacts with the user. The unique aspect of our system is that our server constructs each HTML page dynamically at every user click.

The Web site is designed with a system backbone, with important sections that incorporates theory of Trust and Customer Advocacy. On the first introduction page and the main page, the Web page does not morph. However, as the user traverse deeper into each section, the Web site learns about the user's Cognitive/Cultural Styles and morphs the different pages to adapt to the user. Figure 4-3 shows the

backbone of the experimental British Telecommunications Morphing Web site and how many different morphs each level adapts to.

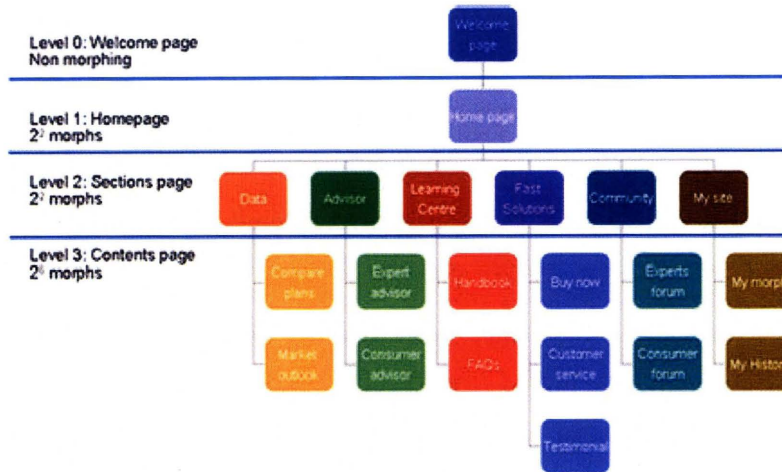


Figure 4-3: System Backbone

4.3 The Content Management Engine

The two major challenges to building a Web Morphing System are 1) to determine what the best Web site morph is for the site visitor, and 2) to deliver the best morph. The Mathematical Inference Engine addresses the first issue, and the Content Management Engine addresses the second issue: how to construct and deliver the proper morph once the system has enough information about the visitor.

The brute-force way of approaching this challenge would be to construct all of the possible morphs in HTML ahead of time, store it in a database system, and deliver the proper HTML page morph to the visitor at run time. However, this approach has two major problems. The first is that of scalability. As the number of morph dimensions (combination of Web site Characteristics) increases, the number of possible morphs also grows exponentially. For instance, with 2 binary morph dimensions, the system only has to construct 4 morphs (2^2). However, if there are 10 binary morph dimensions, then the system will have to construct 1,024 morphs (2^{10}). If future business problems require this system to implement more than 10 morph

dimensions, as well as going beyond the current binary morph dimension system, then the number of possible morphs will grow to an unmanageable amount, both in storage space and access time. This leads to our second problem: maintenance. With only 4 morphs, changing a picture or updating prices on half of the morphs should not be a big problem. However, if one needs to update prices on more than half the morphs for a system with 10 dimensions, then the developer would have to change 512 morphs. One can see that this brute-force scheme could turn into a maintenance nightmare.

To address these two challenges, our team has designed a scalable Content Management Engine, which is built on XML and PHP technology. For more details on the Content Management Engine, please refer to Shirley Fung's Master Thesis [1].

Ultimately, the Content Management Engine is able to create HTML pages for all of the individual morphs from reusable Web page modules from the file system (e.g. pictures, text, audio ...etc). This leads to the next design decision: using a Model-View-Controller Framework. Because we want the ability to create web pages at runtime, we need our Web site to have the ability to process logic between the time of receiving user mouse click and returning an HTML webpage. As a result, we are drawn to a Model-View-Controller programming paradigm where our Web site will have the capability of running logic during run time. Furthermore, we look to one of the most popular MVC framework, RAILS, for inspiration. Due to the fact that our servers already support PHP, we looked for other MVC framework solutions out there that is similar to RAILS, and we found the package CakePHP.

4.4 The Mathematical Inference Engine

The Mathematical Inference Engine's main job is to learn about the user from user clicks and to tell the Content Management Engine which morph to serve to the Graphical User Interface.

The Mathematical Inference Engine will determine the optimal morph for a user by first calculating the probabilities that a user is in all of the Cognitive/Cultural

Styles, and then given those probability, serve up the optimal morph. Figure 4-4 below illustrates the basic idea of the Mathematical Inference Engine.

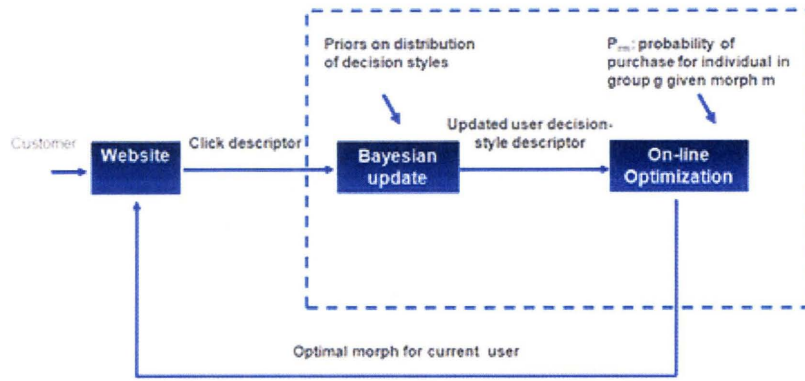


Figure 4-4: Concept of Mathematical Inference Engine

The major difficulty in this system is optimizing the speed, while maintaining scalability. The system has to do all of the Bayesian Updating/Dynamic Programming under a second, and the system has to be flexible enough to handle a large number of possible morphs.

To address the issue of speed, I have decided to implement the entire Mathematical Inference Engine natively in PHP. Furthermore, the two major parts of the Engine, the Bayesian Inference Engine and the Gittins' Index Engine, are implemented as separate CakePHP Components. All variable values and mathematical functions are embedded in these two Components for simplicity.

The issue of flexibility is solved mainly by the overall system design of breaking down the Presentation Logic and the Morphing Logic. The Mathematical Inference Engine is flexible enough to work on systems that do not morph, but rather need to gather information about users from click history. Currently, General Motors is in the talks of a project on using the Mathematical Inference Engine to serve targeted advertisement on GM.com. More details are discussed in Jimmy Li's Master Thesis[3].

In the next chapter, I will discuss the implementation of the Mathematical Inference Engine in detail.

4.5 System Calibration Methodologies

A newly built Morphing Web site, like any newly manufactured instrument, will need to be calibrated. A couple of major issues will need to be addressed. The list of the calibration steps is discussed in the following subsection.

4.5.1 Calibration Steps

In order to build a Morphing Web site, one will need to conduct the following steps.

1. Decide the Cognitive and Cultural Style dimensions. This will determine how users will be categorized. One may need to research the Psychology or Business literature to find possible dimensions to differentiate each user. In the Mathematical Inference Engine, Cognitive and Cultural Styles are coded as the binary vector, r_n .
2. Decide the Web site Characteristics and design the Web site. Once the Web site Characteristics are set and the Web site backbone is designed, it is then possible to list out all of the possible morphs. After specifying the morphs, it is important to break the morphs into modularized, reusable content blocks that can be used across morphs. This allows the designer to fully take advantage of the Content Management Engine so that updating content in the future will be easy.
3. Run a study with a panel of judges to determine the weight values of the Web site Characteristics. The purpose of this is to acquire values for the C_{kjn} 's for each link on the site. The details for conducting this study can be found in Chapter 5 of Shirley Fung's Master of Engineering Thesis [1].
4. Design a questionnaire for the calibration study. The next step is to prepare for a calibration study in a test market. The purpose of this is to give the system enough data to estimate parameters such as the estimated preference weights for users (the Ω Matrix). Recall that the Ω Matrix is the relationship between

the Cognitive and Cultural Styles and the Web site Morphs. The procedure to estimate this is found in Appendix II, prepared by Guilherme Liberali.

5. Run initial calibration study. This acquires enough data for us to generate values for the proper parameters. All of the parameters that needs to be estimated will be discussed in the next step.
6. Estimate P_{rm} , α , and β for Gittins' Tables. Details for estimating each of these parameters is listed in the Appendix.
7. Estimate Gittins' Indices, $G_{rm}(\alpha, \beta)$. The Matlab code for estimating this parameter is listed in the Appendix.
8. Run Factor Analysis on data to determine whether the Cognitive and Cultural Style dimensions need to be corrected. Again, a sample of this procedure is given in the Appendix Chapter titled "Suruga Project Documents."
9. Run full study with fully morphing Web site to determine effectiveness.

Chapter 5

System Architecture and Implementation

In this chapter, I will discuss the details of building the Mathematical Inference Engine. The Mathematical Inference Engine serves two purposes:

1. To calculate the probabilities that a particular customer is in different population style segments.
2. Given the information from step (1), determine which is the best morph to show the customer.

5.1 System Description

The Mathematical Inference Engine is divided into two main components: the Bayesian Inference Engine and the Gittin's Index Engine. The Bayesian Inference takes a user's click and calculates q_{rn} , a vector that contains the probabilities that a user is in any of the Cognitive/Cultural Styles segments. The Gittins' Index Engine then takes q_{rn} calculates the optimal morph to serve the user based on the latest purchase data the system has gathered from the population. Figure 5-1 shows the system diagram of the Mathematical Inference Engine.

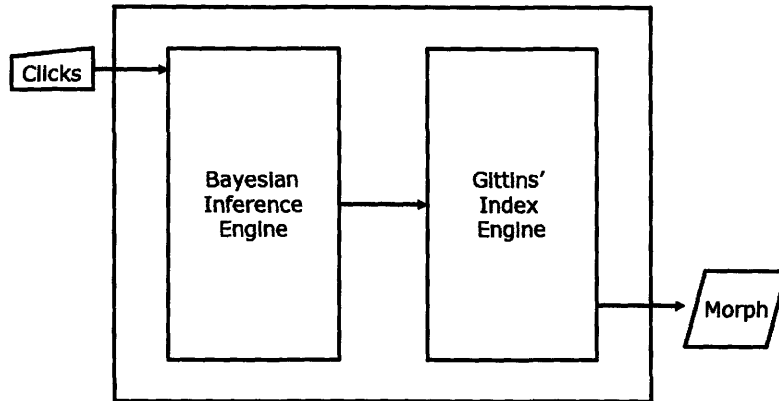


Figure 5-1: System Overview of the Mathematical Inference Engine

5.1.1 System Input and Output

The Mathematical Inference Engine is implemented as a function in the main CakePHP Controller, and is called everytime the Controller of a Web page loads. This function takes two parameters: `$page` and `$link`. `$page` is the parameter that refers to the current page that user is on, and `$link` is the parameter that refers to the current link that user has clicked on. The function uses these two parameters to retrieve the `$c_selected` and `$c_total` from the MySQL database with the two following lines:

```
$c_selected = $page->findAll("Morph = '$morphNum' AND Link = '$link'");
$c_total = $page->findAll("Morph = '$morphNum'");
```

Once the parameters are retrieved from the database, the Mathematical Inference Engine uses the `makeCVector()` function to change the data into the proper formats to be used for the `run_bayesian_engine()` function.

```
$c_selected = $this->makeCVector($c_selected, $page);
$c_total = $this->makeCVector($c_total, $page);
```

The `run_bayesian_engine()` function returns the `$q_updated` vector, the posterior probabilities that a user is in each Cognitive/Cultural Style segments. This is

then passed to the `run_gittins_engine()` to calculate the optimal morph for the user. In the end, the optimal morph is stored in the `$bestMorph` variable, and is written to the CakePHP Session Variable `morph_array`. The `morph_array` Session Variable is what the Rules Engine uses to determine which morph to construct after every click. If one ever needs to override the output of the Gittins' Index Engine, one can simply overwrite the values in this Session Variable.

The last consideration in the Math Engine function is to check whether the user has taken the "My Morph" survey. Once the system has determined the user's best morph from the survey, this morph is stored into the Session Variable `morph_override`. Then, the Session Variable `morph_array` will always take the value of the variable `morph_override`. The following code checks to see if `morph_override` is set for a particular user:

```
if($this->Session->read('morph_override') != null) {
    $this->Session->write('morph_array', $this->Session->read('morph_override'));
} else {
}
```

I will now discuss the two major components of the Mathematical Inference Engine: the Bayesian Inference Engine and the Gittins' Index Engine.

5.2 Bayesian Inference Engine

The purpose of the Bayesian Inference Engine is to calculate the probabilities that a customer is in each cognitive and cultural styles. Since this engine is the only portion of the Mathematical Inference Engine that requires a significant amount of calculation, I decided to implement this portion natively in PHP for speed. Additionally, the core calculation of this engine involves matrix multiplication, and I wrote streamlined version of the Matrix Multiplication function in the Math Matrix Package from the PHP Extension and Application Repository (PEAR) to handle matrix operations¹.

¹The Math Matrix Package from PEAR can be found at the following link: http://pear.php.net/package/Math_Matrix

To integrate into the CakePHP MVC environment, the Bayesian Inference Engine is implemented as a CakePHP Component ². The PHP code for the Bayesian Inference Engine can be found in the Appendix, under `bayesian_engine.php`.

5.2.1 System Inputs and Output

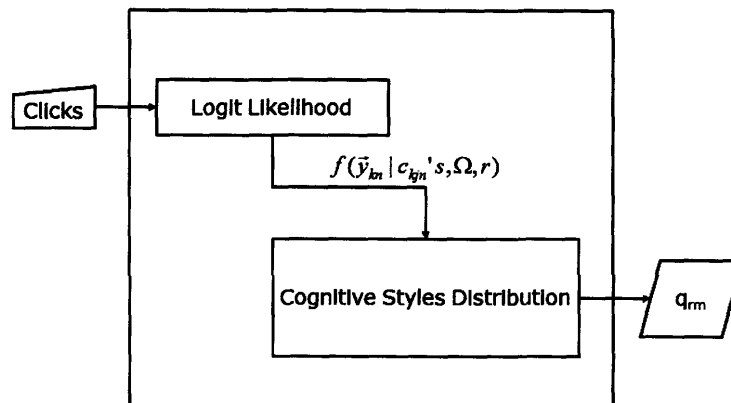


Figure 5-2: System Diagram of the Bayesian Inference Engine

The Bayesian Engine is built according to figure 5-2. This engine is invoked by the `math_engine()` function in the Controller with a call to the function `run_bayesian_engine()`:

```
$q_updated = $this->BayesianEngine->run_bayesian_engine($c_selected, $c_total);
```

Inputs - \vec{c}_{kjn} 's

There are two inputs to the function `run_bayesian_engine()`:

1. `$c_selected` - a $1 \times c$ sized vector of the characteristic description values of the link that the user has clicked on. This quantity is known as \vec{c}_{kjn} in equation 3.1. This vector is implemented as an array of array format. For

²The CakePHP version used at the time of this thesis is 1.1.15.5144. Please refer to the CakePHP site for updates and documentation: <http://www.cakephp.org/>

instance, a possible declaration of a variable suitable for this input can be:
 $\$c = \text{array}(\text{array}(1.3, 1.2, 5.2, 4.2, 3.2))$.

2. $\$c_total$ - this parameter is an array of arrays of all of the \vec{c}_{k_jn} 's on the current page where the user is observing. For instance, if the current Web page has three links, where $\$c1 = \text{array}(\text{array}(1.1, 1.1, 1.1, 1.1, 1.1))$, $\$c2 = \text{array}(\text{array}(2.2, 2.2, 2.2, 2.2, 2.2))$, and $\$c3 = \text{array}(\text{array}(3.3, 3.3, 3.3, 3.3, 3.3))$, then declaration for a variable suitable for this input can be $\$c_total = \text{array}(\$c1, \$c2, \$c3)$. The main rule to follow in this declaration is that each element of this array has to be in the array-array format that $\$c_selected$ follows.

The values for the \vec{c}_{k_jn} for all link on all pages is acquired through a method called "The C's Panel." This methodology is described in Shirley Fung's Thesis [1]. Furthermore, each individual element of the \vec{c}_{k_jn} vector are of floating-point value.

Internal Variables - $q_o(r_n)$, Ω and \vec{r}_n

In addition to the two input parameters, there are three other parameters embedded into the Bayesian Inference Engine:

1. $\$q_o$ - The first parameter is $q_o(r_n)$, the prior probabilities that a user is in each Cognitive/Cultural Style segment. This mathematical quantity is implemented as a $1 \times r$ dimensional array. An example of the initial $\$q_o$ follow:

```
 $\$q\_o = \text{array}(0.015625, 0.015625, 0.015625, 0.015625, 0.015625,$   

 $0.015625, 0.015625, 0.015625, 0.015625, 0.015625,$   

 $0.015625, 0.015625, 0.015625, 0.015625, 0.015625,$   

 $0.015625, 0.015625, 0.015625, 0.015625, 0.015625,$   

 $0.015625, 0.015625, 0.015625, 0.015625, 0.015625,$   

 $0.015625, 0.015625, 0.015625, 0.015625, 0.015625,$   

 $0.015625, 0.015625, 0.015625, 0.015625, 0.015625,$   

 $0.015625, 0.015625, 0.015625, 0.015625, 0.015625,$ 
```

```

0.015625, 0.015625, 0.015625, 0.015625, 0.015625,
0.015625, 0.015625, 0.015625, 0.015625, 0.015625,
0.015625, 0.015625, 0.015625, 0.015625);

```

The above array is an example of the starting values of $\$q_o$, stored in the main Bayesian Inference Engine function `run_bayesian_engine()`. The value 0.015625 is derived from $\frac{1}{64}$, which states that the system's assumes that the probabilities that the new user belongs to each of the $r = 64$ styles is equal.

This parameter is not entirely an internal parameter; it is a feedback parameter. For every user, after the first mouse click, the system actually uses the posterior Cognitive/Cultural Style segment probability distribution q_{rn} as the new prior. The array q_{rn} is stored in the CakePHP session variable `qrm` and is retrieved in the `run_bayesian_engine()` function at every click with the following code:

```

$q_o = $this->controller->Session->read('qrm');

```

This code uses the CakePHP Session Variable function `Session->read()` to retrieve the session variable `qrm`. For more description of the `run_bayesian_engine()` function, please refer to the "System Functions" below.

2. $\$omega$ - The second parameter is Ω , the estimated preference weights. This is the parameter that mathematically links a user's Cognitive/Cultural Style \vec{r}_n with a Web site's description \vec{c}_{kjn} . Like $\$c_selected$, $\$omega$ is implemented as an array of arrays that includes all of the estimated preference weight values. The PHP implementation follows:

```

$omega = array(
    array( 0.306886337,-0.351747884,0.2675115,0.338104078,-0.08713767,-0.216492244),
    array(0.024588068,0.382396738,0.432450167,0.659243389,0.11872986,0.623139952),
    array(-0.547711017,-0.05775452,-0.752668463,0.528132904,-0.342280965,-0.414193924),
    array(0.369257486,0.467480937,-0.138592263,-2.648347411,0.347113845,0.401373187),
    array(-0.458278335,-0.157308092,-0.704509763,0.690139627,-0.247161656,-0.372715614),
    array(0.245604221,-0.175453193,0.621215712,0.410845333,-0.021670326,-0.179109178),
    array(0.974829915,0.701330568,1.253445604,-2.553423408,0.193183421,-0.011871656),
    array(-0.721052466,0.71761397,-1.072981395,1.468353556,-0.425812393,-0.329705124),
    array(1.568945196,2.409547547,0.727642527,-1.758748402,0.218374415,0.846304701),

```

```

array(-1.951283449,-0.361269778,1.918897682,0.224011679,-1.08532626,-0.635000432),
array(-0.033273637,1.272659452,-0.947041293,-0.545948918,3.305496833,0.24909425),
array(-0.378937281,-0.152917326,0.753209751,-0.922432262,-0.344579096,-0.439660144),
);

```

For the procedure on estimating of these values, please refer to Professor Guilherme Liberali's STATA and WinBUGS code in the Appendix. Description on the mathematical quantity Ω can be found in Chapter 3.

3. `$r_vector` - the last parameter includes all of the possible \vec{r}_n 's that a user can have. Each \vec{r}_n is a r -digit binary vector that describes a user's Cognitive/Cultural style. Each element of `$r_vector` is implemented as a $1 \times r$ digit binary array where each element is an array of size 1 and r is the number of Cognitive/Cultural Style dimension the system supports. For instance, for a system that support 6 Cognitive/Cultural Style dimensions, $r = 6$ and an implementation of the mathematical quantity $\vec{r}_n = [0, 0, 0, 0, 0, 0]$ is:

```

$r_000000 = array( array(0), array(0), array(0), array(0), array(0), array(0) );

```

All binary combinations of \vec{r}_n are implemented this way until all combinations until $\vec{r}_n = [1, 1, 1, 1, 1, 1]$ are enumerated. The final step is to store all of these arrays into a single array called the `$r_vector`:

```

$r_vector = array( $r_000000 , $r_000001 , $r_000010 , $r_000011 , ... , $r_111111);

```

The design choice to embed the `$r_vector` is to improve speed. Since the `$r_vector` do not have to change during runtime, it is better to embed its values into code rather than implementing these values in a database such as MySQL. However, if future systems calls to make the r_{rn} 's continuous, this issue will have to be revisited to optimize for access speed and system reliability.

The reason why `$omega` and each element of `$r_vector` are implemented as array of arrays is for consistency in the `matrix_multiplication()` function. For future development, I wanted the `matrix_multiplication()` function to have the ability

to handle `$c_selected` and elements in `$r_vector` in matrix format in case if our team decides to expand upon the current inference model.

$q_o(r_n)$, Ω and \vec{r}_n were originally all implemented as PHP global variables `$q_o`, `$omega`, and `$r_vector`, however, CakePHP does not allow global variable calls easily in a Component, hence I decided to nest the variables within the function calls that use them. In the current implementation, `$q_o` is embedded in the function `run_bayesian_engine()`, `$omega` is embedded in the function `exp_CWR()`, and `$r_vector` is embedded in the function `all_logit_likelihood()`. Please refer to “System Functions” section below for more description on these functions.

Output - q_{rn}

The final output of the Bayesian Inference Engine is q_{rn} , the posterior distribution that a user is in each Cognitive/Cultural Style segment. This quantity is implemented as a $1 \times r$ dimensional array `$q_rm` where r is the number of Cognitive/Cultural Style segments that the system supports. This variable is returned by the `run_bayesian_engine()` function at every user click. In addition, `$q_rm` is written to the CakePHP session variable `qrm` to be used as the prior at the next user click. The CakePHP session function call follows:

```
$this->controller->Session->write('qrm',$q_rm);
```

5.2.2 The Bayesian Inference Engine Algorithm

There are two main steps in the Bayesian Inference Engine Algorithm:

1. Determine $f(\vec{y}_{kn} \mid \vec{c}_{kjn}, r_n, \Omega)$, the probability that the Web site observes click \vec{y}_{kn} on a link with characteristic described by \vec{c}_{kjn} given prior information on user n 's Cognitive/Cultural Style r_n .
2. Then, given the information from step 1, determine q_{rn} , the posterior distribution that user n is in each of the r Cognitive/Cultural Style segments.

The basic algorithm is derived from equations 3.1. Since y_{jkn} is zero for all J_k links except for the one link on the page that user n clicked on, equation 3.1 can be simplified to equation 5.1, where $y_{jkn} = 1$ for the click that the system observes. Equation 5.1 also makes the substitution of $\vec{\omega}_{r_n} = \Omega \vec{r}_n$, where Ω is the estimated preference weights and \vec{r}_n is a r -digit Cognitive/Cultural style binary vector.

$$f(\vec{y}_{kn} | \vec{c}_{kjn}, \vec{r}_n, \Omega) = \frac{\exp[\vec{c}_{kjn} \Omega \vec{r}_n]}{\sum_{l=1}^{J_k} \exp[\vec{c}_{jln} \Omega \vec{r}_n]} \quad (5.1)$$

At every click, the system calculates equation 5.1 as inputs into equation 3.2 to calculate q_{rn} , the posterior probability distribution that a given user is in Cognitive/Cultural Style segments. Since the system calculates at every click K_n , equation 3.2 reduces to the following equation in implementation:

$$q_{rn} = f(r_n | \vec{y}_n, \vec{c}_{kjn}, \Omega) = \frac{f(\vec{y}_{kn} | \vec{c}_{kjn}, \vec{r}_n, \Omega) q_o(r_n)}{\sum_{r_o=0}^{15} f(\vec{y}_{kn} | \vec{c}_{kjn}, \vec{r}_n, \Omega) q_o(r_n)} \quad (5.2)$$

where $q_o(r_n)$ is the prior Cognitive/Cultural Style segment probability distribution from the the previous click.

5.2.3 System Functions

This section documents the purpose and implementation of the major functions in the Bayesian Inference Engine Component from `bayesian_engine.php`.

1. `matrix_multiplication()`

The purpose of the `matrix_multiplication()` function is to multiply two matrices together. This function takes two reference parameters: `$first` and `$second`, referring to the first and second matrix. The only assumption this function makes is that both `$first` and `$second` are in the array of arrays format. Hence, in order for this function to act properly, when one needs to multiply a $1 \times k$ array by a $k \times 1$ array, both arrays must be declared as an array of array in order to use this function. This is why `$c_selected`, and

each element of `$r_vector` are implemented in the array of array fashion even though they are both vectors.

Originally I had planned to use the Math Matrix Package from the PHP Extension and Application Repository (PEAR) to handle matrix operations, however, I soon realized that the only operation I needed from that package was the Matrix Multiplication function. Furthermore, speed constraints prompted me to write a more streamline version of the Matrix Multiplication function found in the Math Matrix Package. I decided to write this function from scratch and not use the Math Matrix Package.

2. `exp_CWR()`

The purpose of the `exp_CWR()` function is to calculate the exponent of the observed utility of a mouse click. The equivalent mathematical expression is $exp[\vec{c}_{kjn} \Omega \vec{r}_n]$. This function takes two inputs: `$c` and `$r`, and both must be in the array of array format. The Ω matrix is embedded into this function as the variable `$omega`, also in an array of arrays format. Within this function is the place where the values and dimensions of the Ω matrix should be modified for future changes.

The function mainly does two matrix multiplications. It first multiplies `$omega` and `$r` together, and stores it into the variable `$first_product`. Then, it multiplies `$c` with `$first_product` to get `$second_product`. Since `$second_product` is in array of array format, the system needs to extract the numerical value of the only element within this variable before taking it as an exponent. The following line does exactly that:

```
$result = exp($second_product[0][0])
```

Finally, the function returns the value `$result`. This function is used by the function `all_logit_likelihood()` to conduct the calculation found in equation 5.2.

3. `compute_logit()`

The purpose of the `compute_logit()` function is to be used in conjunction with `exp_CWR()` to calculate the multivariate logit value of a click on a page,

$$\frac{\exp[\vec{c}_{kjn}\Omega\vec{r}_n]}{\sum_{l=1}^{J_k} \exp[\vec{c}_{jln}\Omega\vec{r}_n]}.$$

This function takes two inputs: `$selected_link_u` and `$all_links_u`.

`$selected_link_u` is the u value of the clicked link, and it is of the format of a floating point value, where u is the output returned by the `exp_CWR()` function.

`$all_links_u` is a single-row array containing the u values for all of the links on the current page. These two variables are first prepared in the proper format in the `all_logit_likelihood()` function before calling the `compute_logit()`.

4. `all_logit_likelihood()`

The purpose of the `all_logit_likelihood()` function is to use `exp_CWR()` and `compute_logit()` functions to calculate the logit likelihood values for all links, $\frac{\exp[\vec{c}_{kjn}\Omega\vec{r}_n]}{\sum_{l=1}^{J_k} \exp[\vec{c}_{jln}\Omega\vec{r}_n]}$, iterated through all possible Cognitive/Cultural styles segments.

The two main inputs, `$c_selected` and `$c_total` are the same two inputs into the main Bayesian Inference Engine. The same format constraints apply. Furthermore, the value of `$r_vector` and its elements are declared in this function. The algorithm runs through two `for` loops to iterate through all elements in the `$r_vector`, all links on the current page, and it generates the `$logit_likelihood_vector[]`, which contains the values of logit likelihoods for all links and all possible Cognitive/Cultural Style segments. The `$logit_likelihood_vector[]` is index in the same order as `$r_vector`.

5. `run_bayesian_engine()`

The purpose of the `run_bayesian_engine()` is to calculate q_{rn} , the posterior probabilities that a user is in all Cognitive/Cultural Styles segments. This is

the main function for the Bayesian Inference Engine. This function takes two inputs: `$c_selected` and `$c_total`, and this function calculations equation 5.2.

The function first checks to see whether the user has clicked more than once. If this is the first page that the user sees, then the system loads up the initial values for `$q_o`, embedded in the function, to used as the prior probabilities in the Bayesian calculation. If the user has clicked more than once, then it retrieves the posterior probabilities, `qrm`, of the previous click from a CakePHP Session Variable to use as the new prior probabilities. This is done with the following conditional:

```
if ($this->controller->Session->read('math_engine_run_count') > 1) {
    $q_o = $this->controller->Session->read('qrm');
}
```

It then calculates the `$all_logit_likelihood_vector[]` by using the `all_logit_likelihood()` function. This vector is indexed by r , the possible Cognitive/Cultural Style segments of a user. Next, this function uses a `for` loop to iterate through all possible r 's to calculate the variable `$q_denominator`. This is the denominator from equation 5.1. Then, it uses another `for` loop to iterate through all possible r 's again to calculate the vector `$q_rm[]`. This is the final output of the Bayesian Inference Engine and it is written to the CakePHP session variable `$qrm` with the following code before returning the output to the Controller.

```
$this->controller->Session->write('qrm',$q_rm);
```

5.3 Gittins' Index Engine

The purpose of the Gittins' Index Engine is to determine the optimal morph to serve the user using the Gittins' Index. Since the entire Web site is written in PHP, I have decided to implement the engine in PHP for speed. To integrate into the CakePHP

MVC environment, the Gittins' Engine is implemented as a CakePHP Component³. It is invoked by the `math_engine()` function in the main Controller with a call to the function `run_weighted_gittins_engine()`. The reference for the code for the Gittins' Index Engine can be found in the Appendix Chapter "Source Code and Site Testing Simulation."

In essence, the Gittins' Index Engine is made of the following two tables:

1. The r - m Table
2. The α - β Table

I will discuss what these three tables are and why they are important in the subsequent sections.

5.3.1 System Inputs and Output

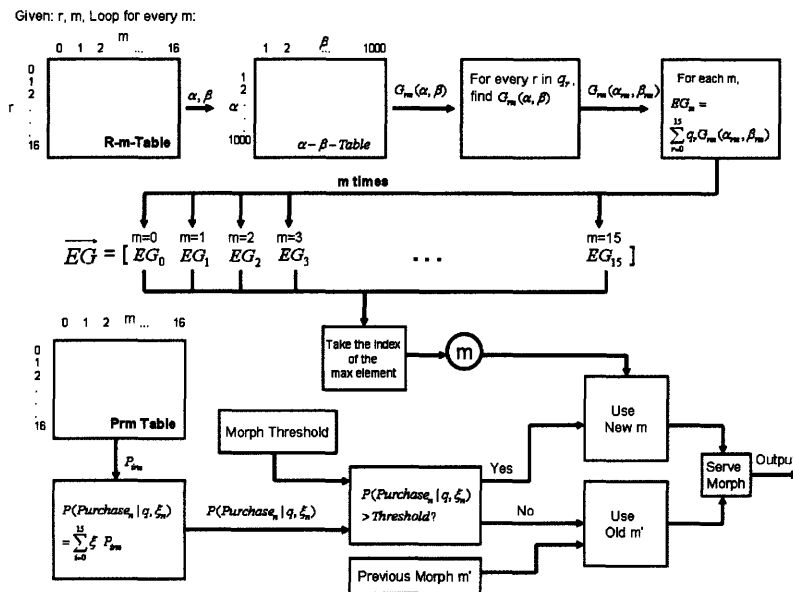


Figure 5-3: System Diagram of the Gittins' Index Engine

³For the definition of a CakePHP Component, please refer to the CakePHP documentation at <http://book.cakephp.org/view/315/components>

The Bayesian Engine is built according to figure 5-3. There are two inputs to the `run_weighted_gittins_engine()` function:

1. `$cognitive_style_vector` - The input to this parameter should be $q_r n$, the probabilities that the current customer is in all of the Cognitive/Cultural Styles (r). This is a vector with the dimension $1 \times r$. This is represented as $q_r n$ in equation 3.2 and is the output to the Bayesian Engine. In the Controller code, this input is represented as the PHP variable `$q_updated`. Each element in the vector should be able to handle floating-point values from 0 to 1.
2. `$morph_weights_vector` (The ξ_{in} Vector) - The input to this parameter should be a vector that consists the updated weights for each morph seen by the user. This is represented as an $1 \times m$ vector where m is the number of morphs the system supports. Each element in the vector should be able to handle floating-point values from 0 to 1. In addition, the sum of all elements in the vector should add up to 1. This vector is used to help the Gittins' Index Engine weigh the morphs that the user has already seen. Section 5.4 will discuss the Weighted Morphing concept in detail.

The final output of the Gittins' Index Engine is m , the optimal morph to serve to the user. The PHP variable `$morph`, representing m in the code, is an integer value which ranges from 1 to 16, the current maximum number of morphs.

5.3.2 The Gittins' Index Engine System Algorithm

The basic algorithm is derived from equations 3.3, reproduced here, as equation 5.3.

$$EG_{mn} = \sum_{r=0}^{15} q_{rn} G_{rmn}(\alpha_{rmn}, \beta_{rmn}) \quad (5.3)$$

Where EG_{mn} is the Expected Gittins' Index, and $G_{rmn}(\alpha_{rmn}, \beta_{rmn})$ is the Gittins' Index for user n who can be described by the Cognitive/Cultural Style Segment r with corresponding α_{rmn} and β_{rmn} values, and is exposed to the Web site morph m .

The Gittins' Index Engine system can be described by figure 5-3.

The system begins with two main for loops that iterates through each morph m and style r :

```

for ($m=0; $m<$morph_size; $m++)
{
  for($r=0; $r<$r_size; $r++)
  {
    $alpha_beta_vector = $this->lookup_alpha_beta($r, ($m+1));
    $alpha = $alpha_beta_vector[0];
    $beta = $alpha_beta_vector[1];
    $G_vector[$r] = $cognitive_style_vector[$r] * $this->lookup_gittins($alpha, $beta);
  }
  $expected_gittins_vector[$m] = $this->sum($G_vector);
}

```

For each value of r and m , the system then looks up α and β values from the r - m Table. These values are then stored as the variables `$alpha` and `$beta`, and are passed to the `lookup_gittins()` function. The `lookup_gittins()` function then looks up the Gittins' Index values for the corresponding α and β values in the α - β Table. Once the Gittins' Index value is acquired, it is then multiplied by the corresponding r element in the q_r vector (indicated as the `$cognitive_style_vector[]` in the code). For each r , the product (let's called this Gittins' Product) is then stored into a temporary vector `$G_vector`, which will be used when the system sums all of the Gittins' Products to acquire the Expected Gittins' Index, EG_m . There are a total of m numbers of EG_m . All of the EG_m 's are stored in the `$expected_gittins_vector[]`, and this array is indexed by the morph value m .

In order to get the optimal morph value, the system returns the index of the element in the `$expected_gittins_vector[]` which contains the greatest element value.

```

$morph = $this->return_key_array_max($expected_gittins_vector);

```

The above code reflects the idea that the morph with the highest Gittins' Index should be the current optimal morph for a user belonging to a particular Cognitive/Cultural Style r . The system uses the `return_key_array_max()` function to return the index of the element in the array that has the highest value.

5.3.3 The r - m Table

Table Structure

Conceptually, the r - m Table is a lookup table that stores the corresponding α and β values for each r - m combination. For instance, in a simpler case where there are only a total of 2 Cognitive/Cultural Style segments (segments, not dimensions), and the total number of morphs is 2, the total number of cells in the r - m Table would be $2 \times 2 = 4$ ($r \times m$). This table enumerates all the possible combinations of person style r being exposed to morph m . An example of what the r - m Table looks like is given in table 5.1.

α_{rm}, β_{rm}		Morph number m			
		1	2	...	m
Style r	1	$\alpha_{1,1}, \beta_{1,1}$	$\alpha_{1,2}, \beta_{1,2}$	...	$\alpha_{1,m}, \beta_{1,m}$
	2	$\alpha_{2,1}, \beta_{2,1}$	$\alpha_{2,2}, \beta_{2,2}$	...	$\alpha_{2,m}, \beta_{2,m}$
	3	$\alpha_{3,1}, \beta_{3,1}$	$\alpha_{3,2}, \beta_{3,2}$	...	$\alpha_{3,m}, \beta_{3,m}$
	...	$\alpha_{n,1}, \beta_{n,1}$	$\alpha_{n,2}, \beta_{n,2}$	...	$\alpha_{n,m}, \beta_{n,m}$
	r	$\alpha_{r,1}, \beta_{r,1}$	$\alpha_{r,2}, \beta_{r,2}$	...	$\alpha_{r,m}, \beta_{r,m}$

Table 5.1: Example of r - m Table

Estimation of α and β

α_{rm} can be thought of as the number of people belonging to Cognitive/Cultural Style segment r that purchased on the Web site when exposed to morph m . Likewise, β_{rm} are the number of people that do not purchase on the Web site in the style-morph cell of r - m . The idea behind this is to model the purchase behavior of consumers as a Bernoulli process with purchase probability P_{rm} . We also model our prior beliefs of P_{rm} with a Beta Distribution. Since the Beta Distribution is conjugate to the Bernoulli process, it can be shown that the posterior distribution of the purchase probability is also a Beta Distribution. The equation of a Beta Distribution is reproduced in equation 5.4.

$$f(P_{rm}) = \frac{\Gamma(\alpha + \beta)}{\Gamma(\alpha)\Gamma(\beta)} (P_{rm})^{\alpha-1} (1 - P_{rm})^{\beta-1} \quad (5.4)$$

where P_{rm} is the observed purchase probability of all users in a particular r - m cell, and the Beta Distribution formulation also states the following:

$$E[P_{rm}] = \frac{\alpha_{rm}}{\alpha_{rm} + \beta_{rm}} \quad (5.5)$$

and

$$var(P_{rm}) = \frac{\alpha_{rm}\beta_{rm}}{(\alpha_{rm} + \beta_{rm})^2(\alpha_{rm} + \beta_{rm} + 1)} \quad (5.6)$$

where equation 5.5 and 5.6 state the expectation and variance of a customer that belongs to style r and has seen morph m .

The α and β values can be acquired by backsolving equation 5.5.

Since it is hard to acquire enough real data for each r - m cell, we will need to build a model to estimate P_{rm} . The procedure for estimating P_{rm} is described in the Appendix.

Definition of a Customer Purchase

Because the current Web site does not have the capability to allow customers to purchase products directly, our team had to find a way to estimate the amount of people that would purchase. To estimate the amount of people who would purchase in a particular r - m cell, we use each customer's stated likelihood of purchase from the field study. Then, the system can use these values to update α and β values for each r - m cell. An example of the stated likelihood of purchase question is included, and this is a common methodology in assessing purchase intent in Marketing research.

Updating of α and β

As mentioned in the previous section, because the current Web site does not allow users to purchase products online, the system cannot use real-time purchases to update the α and β values during the field study. Currently, I will have to manually update all values in the r - m Table after every phase in the field research. However, for future development, it would be ideal that the system will be able to automatically

update the α_{rm} and β_{rm} values for every r - m cell according to the following rules:

$$\alpha_{rmn} = \alpha_{rm,n-1} + \delta_{mn} \quad (5.7)$$

and

$$\beta_{rmn} = \beta_{rm,n-1} + (1 - \delta_{mn}) \quad (5.8)$$

where α_{rmn} is the number of people who purchased for a particular r - m cell, and $\alpha_{rm,n-1}$ is the number of people who purchased for a particular r - m cell before the current customer n . δ_{mn} is a binary variable: it is 1 if customer customer n purchases and 0 otherwise. The same nomenclature applies to β 's in equation 5.8 as well.

Implementation of the r - m Table

I have explored a couple of ways to implement the r - m Table. Initially I had tried to implement this as tables in the MySQL database, since ideally the system would be able to update these α and β values automatically. However, I soon found that because the initial two for loops makes $r \times m$ number of calls to this table, speed is a major obstacle for this implementation. For the British Telecommunication Web site, where $r = 64$ and $m = 64$, it takes nearly 10 seconds for each page to finish loading. This is far beyond the tolerance of any typical modern day Web user.

Considering the speed issue and the fact that my current implementation of the Web site cannot handle live purchases, the r - m Table does not need to be updated automatically. Hence, I decided to embed this table as array of arrays in the code to improve access speed. I will now discuss how this table is implemented in PHP code:

```
$r0m1_alpha_beta = array(6, 7);  
$r0m2_alpha_beta = array(6, 7);  
$r0m3_alpha_beta = array(6, 7);  
$r0m4_alpha_beta = array(5, 7);  
...  
$r15m16_alpha_beta = array(7, 7);
```

First, each of the α and β values are stored as an array in variables with the

naming convention `$rNUMmNUM_alpha_beta` , where the NUM in the array name corresponds to the r or m value that the array corresponds to. For instance, the variable `$r0m1_alpha_beta` is an array that carries the α and β values for the Cognitive/Cultural Style Segment $r = 0$ and Morph $m = 1$. The starting value for r is 0 because this makes PHP array indexing easier. The starting value for m is 1 because when the `$morph` variable, the final output to the system, is returned to the controller, the Rules Engine can readily comprehend the morph number in this manner.

The next step is to store each `$rNUMmNUM_alpha_beta[]` arrays into r number of arrays named `$r_table_vector_NUM`, where NUM is the value of r . Note that the following declaration for `$r_table_vector_0` includes all of the `$rNUMmNUM_alpha_beta[]` arrays with the NUM of $r = 0$. The idea behind this is to group all array's with the same r together, and index the individual arrays according to the m value.

```
$r_table_vector_0 = array($r0m1_alpha_beta, $r0m2_alpha_beta, ... $r0m16_alpha_beta );
```

The final step would be to store the `$r_table_vector_NUM` arrays into another array named `$r_table_var[]`. This array is now indexed by the number r .

```
$r_table_var = array( $r_table_vector_0, $r_table_vector_1, $r_table_vector_2, ... );
```

This α and β values are accessed in the `run_weighted_gittins_engine()` function using the `lookup_alpha_beta()` function. The code for `lookup_alpha_beta()` function can be found here:

```
function lookup_alpha_beta($r, $m)
{
    $r_table_array = $this->r_table;
    $morph_vector = $r_table_array[$r];
    // morph vector's index starts with 0, but in that element is the alpha and beta vector for morph=1
    $alpha_beta_vector = $morph_vector[$m-1];
    $results = $alpha_beta_vector;
    // return both the alpha and beta in a results array
    return $results;
}
```

This function takes two parameters `$r`, and `$m` and returns a two-element array with the α and β values for the given r and m .

5.3.4 The α - β Table

Table Structure

The α - β Table is also called the Gittins' Index Table. This table stores the Gittins' Indices for all values of α and β . As illustrated in table 5.2, the table itself is index by two variables, α and β .

$G_{rm}(\alpha_{rm}, \beta_{rm})$		β			
		1	2	...	B
α	1	$G_{rm}(1, 1)$	$G_{rm}(1, 2)$	...	$G_{rm}(1, B)$
	2	$G_{rm}(2, 1)$	$G_{rm}(2, 2)$	...	$G_{rm}(2, B)$
	3	$G_{rm}(3, 1)$	$G_{rm}(3, 2)$	...	$G_{rm}(3, B)$
	...	$G_{rm}(n, 1)$	$G_{rm}(n, 2)$	...	$G_{rm}(n, B)$
	A	$G_{rm}(A, 1)$	$G_{rm}(A, 2)$	...	$G_{rm}(A, B)$

Table 5.2: Example of α - β Table

Estimation of the Gittins' Indices

The estimation of the Gittins' Indices is conducted by Professor Guilherme Liberali, a visiting Scholar at MIT Sloan School of Management and Theta Aye, a Ph.D. student in the Operations Management department. The MATLAB code that is used to estimate these values is included in the Appendix.

Implementation of the α - β Table

Again, like the r - m Table, this table is accessed $r \times m$ times. Furthermore, unlike the r - m Table, in theory this table does not need to be updated live, since statistical estimation will need to be conducted in order to obtain each Gittins' Index. As a result, I have decided to implement this table in a similar fashion as the r - m Table, using the array of arrays technique. Below is the code excerpt:

```

$alpha_beta_1 = array( 0.9728, 0.9807, 0.9843, 0.9864, 0.9879, 0.989, 0.9898, 0.9905, 0.9911, 0.9915 );
$alpha_beta_2 = array( 0.8939, 0.9247, 0.9395, 0.9486, 0.9549, 0.9595, 0.9631, 0.966, 0.9684, 0.9704 );
$alpha_beta_3 = array( 0.7991, 0.8523, 0.8801, 0.8977, 0.9102, 0.9195, 0.9268, 0.9327, 0.9376, 0.9417 );
$alpha_beta_4 = array( 0.7091, 0.7792, 0.8177, 0.8432, 0.8616, 0.8755, 0.8866, 0.8956, 0.9031, 0.9095 );
$alpha_beta_5 = array( 0.6328, 0.7114, 0.7582, 0.7897, 0.8132, 0.8312, 0.8457, 0.8576, 0.8676, 0.8762 );
$alpha_beta_6 = array( 0.5672, 0.6506, 0.7032, 0.7397, 0.7668, 0.7884, 0.8059, 0.8202, 0.8325, 0.843 );

```

```

$alpha_beta_7 = array( 0.5114, 0.5985, 0.6531, 0.6934, 0.7238, 0.7479, 0.7677, 0.7844, 0.7986, 0.8107 );
$alpha_beta_8 = array( 0.4647, 0.5523, 0.6086, 0.6509, 0.6839, 0.7102, 0.7319, 0.7501, 0.766, 0.7798 );
$alpha_beta_9 = array( 0.4245, 0.5115, 0.5695, 0.6121, 0.6469, 0.6751, 0.6984, 0.7182, 0.7351, 0.7501 );
$alpha_beta_10 = array( 0.3899, 0.4754, 0.5339, 0.5779, 0.6128, 0.6424, 0.6671, 0.6881, 0.7063, 0.7222 );

```

The naming convention for the above arrays is `$alpha_beta_NUM` where NUM is the number of the value of the β and each array is indexed by the value of $\alpha - 1$ (PHP arrays indexing begins with the value 0).

The above implementation only handles the range for α and β up to 10. This can be a problem if the system has the capability to automatically update the α and β values. Hence, for future implementations, it is important to think about how this table can be increased to accommodate for more site visitors, but at the same time keeping the access speed fast. One possibility would be to create multiple $n \times n$ sized tables so that accessing each table would be quick.

The next step would be to store each of the `$alpha_beta_NUM` into another array, named `$gittins_vector_var[]`. This array is indexed by $\beta - 1$.

```

$gittins_vector_var = array( $alpha_beta_1, $alpha_beta_2, ..., $alpha_beta_10);

```

In similar fashion as the *r-m* Table, the Gittins' Indices are accessed by the `run_weighted_gittins_engine()` function using the `lookup_gittins()` function. The code for `lookup_gittins()` function can be found here:

```

function lookup_gittins($alpha, $beta)
{
    //global $mysqli;

    $alpha = round($alpha);
    $beta = round($beta);
    $alpha_vector = $this->gittins_vector[$beta-1];
    $gittins = $alpha_vector[$alpha-1];

    return $gittins;
}

```

This function takes two parameters `$alpha`, and `$beta` and returns the Gittins' Index, a floating-point value, for the given α and β .

5.3.5 The Weighted Morphing Algorithm

The purpose of the Weighted Morphing Algorithm is to take into account the time on which the user has spent on each morph. At this current stage, time is defined as the number of discrete Morph pages seen by a person. For instance, if person n visits the Web site and goes through 5 clicks, in 2 of the clicks he experiences morph 2 and 3 of the clicks he experiences morph 10, we will give morph 2 a weight of $\frac{2}{5}$ and morph 10 a weight of $\frac{3}{5}$.

At every user mouse click, the goal in the end is to compare the entity $P(Purchase_n|q, \xi_n)$, the weighted morph purchase probability, with the Morph Threshold constant. If $P(Purchase_n|q, \xi_n)$ is greater than the Morph Threshold constant, then you would take the latest calculated optimal morph and serve it to the Controller. If the $P(Purchase_n|q, \xi_n)$ is less than the Morph Threshold constant, then the system will return the old optimal morph from the previous user mouse click.

Calculation for the $P(Purchase_n|q, \xi_n)$ is given by equation 5.9.

$$P(Purchase_n|q, \xi_n) = \sum_{i=0}^{15} \xi_{in} P_{irm} \quad (5.9)$$

where ξ_{in} is the Morph Weight for the morph i that user n has observed in his or her current click history. The subscripts i and m differ only in the fact that i refers to the morph in the Morph Weights Vector that the user has observed. m is used generally to refer to any morphs.

The Morph Weights Vector (ξ_n)

The Morph Weights Vector, ξ_n , keeps track of all the morphs that user n has seen in his or her entire history. Equation 5.10 describes the format of this vector.

$$\xi_n = [\xi_{1,n} , \xi_{2,n} , \xi_{3,n} \dots \xi_{m,n}] \quad (5.10)$$

Where the subscript m represents the maximum number of morphs a Web site handles. For the Suruga Web site, $m = 16$. Since $\xi_{i,n}$ are weights of all morphs seen by a person, the sum of all $\xi_{i,n}$ must equal to 1. For instance, if user 2 has spent 3

clicks in morph 2, and 4 clicks in morph 10 in an entire visit history of 7 clicks, this user's morph vector will be represented as the following:

$$\xi_2 = [0 , \frac{3}{7} , 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0 , \frac{4}{7} , 0 , 0 , 0 , 0 , 0]$$

The P_{rm} Table

The Purchase Probabilities for each r - m cell is acquired from the P_{rm} Table is to calculate the value of $P(Purchase_n|q, \xi_n)$. The P_{rm} (Purchase Probability) Table can be visualized in table 5.3.

P_{rm}		Morph Number m			
		1	2	...	M
Style r	1	$P_{1,1}$	$P_{1,2}$	...	$P_{1,M}$
	2	$P_{2,1}$	$P_{2,2}$	...	$P_{2,M}$
	3	$P_{3,1}$	$P_{3,2}$	...	$P_{3,M}$
	...	$P_{n,1}$	$P_{n,2}$	...	$P_{n,M}$
	R	$P_{R,1}$	$P_{R,2}$	...	$P_{R,M}$

Table 5.3: Example of α - β Table

The Morph Threshold Constant

The Morph Threshold Constant is the value in which the system uses to compare the current weighted purchase probability, $P(Purchase_n|q, \xi_n)$, to decide whether to serve up the new m morph that the Gittins' Index Engine has calculated. To acquire this constant, a controlled field study must be conducted. For details on how this constant is calculated, please refer to Professor Guilherme Liberali.

Chapter 6

Contributions and Future Research

6.1 Results and Contributions

Prior research in Marketing Literature has shown the power of user adaptive recommendation and customization system. Implementation of the user adaptive Morphing Engine has made it possible to test the effectiveness of Web site Morphing theory in practice. In this thesis, I have described the steps necessary to build a dynamic, scalable Mathematical Inference Engine for the experimental user-adaptive Web sites my research group has built for companies such as British Telecommunications and Suruga Bank of Tokyo.

The Mathematical Inference Engine incorporates Hauser, Urban, Liberali and Braun's Morphing Theory [2]. The current implementation of the Mathematical Inference Engine uses a Bayesian Inference Engine to calculate the probabilities that each site visitor belongs to each Cognitive/Cultural Style, and it then uses the Gittins' Index Engine to dynamically serve the optimal Web page morph for that visitor. Lastly, the Bayesian Inference Engine also takes into account of the time that a user has spent on each morph by using the Weighted Morphing Algorithm.

In February, 2008, a panel study in Tokyo on the Morphing Web site prototype of Suruga Bank's Card Loans has shown that the number of matches of Cognitive/Cultural Styles to Morphs is effective in improving site evaluation. Yoshio Tokoro, a General Manager at Suruga Bank and MIT Sloan Fellow, demonstrated in

his Master's thesis three main points about a well designed Advocacy Web site [5]:

1. Great product quality and other preconditions for advocacy must be established before implementing an Advocacy Web site.
2. Advocacy impacts customer purchase behavior.
3. A well-designed advocacy site improves brand recognition.

Yoshio Tokoro is a contributing team member and has been working with the group over the last three years.

6.2 Future Research

For future marketing research, it would be interesting to explore the cost of Morphing. Professor Guilherme Liberali has written a document on preliminary thoughts on using two indices to model the Switching and Continuation Costs of Morphing, and this will be included in the Appendix. This is referred to as the "Dual-Indexing Strategy" in Appendix A. It will be important for future system to take into account the penalty cost for Morphing so that the system does not morph the Web site too much, hence confusing the user. Additionally, there are various aspects of the current system that can be improved to magnify the effect of Morphing. For instance, the current system define the \vec{r}_n , the Cognitive/Cultural Style dimensions, with binary values. It would be interesting to explore how Morphing Theory would change if \vec{r}_n were continuous. Lastly, given the information on how Morphing affects customer purchase behavior, it would be interesting to apply Game Theory to explore the long-term competition equilibrium between firms that implement Morphing Web sites¹. Once customer behavior is better understood in the Morphing Web site setting, then it is possible to adjust product prices and customized promotions, all on the Web site.

¹this idea is from a conversation with Professor Carl Mela, Marketing Professor at the Fuqua School of Business of Duke University

On the Computer Science front, it would be interesting to build an intelligent user simulator that can synthetically generate user behavior on Morphing Web sites using decision theory. From our research, we have found that it would be immensely useful to have such a system on hand to test the effectiveness of our Morphing Web site before launching it to field with human subjects. This system can also be generalized to test commercial Web sites and can be useful in industry, saving millions of dollars on market research.

Another front would be to change the method of user-interaction. Currently the system is limited to inferring user information from click history. However, this can be extended to other multi-modal methods in which facial recognition, eye-ball tracking, and voice recognition can be used to gather information about the customer. While this may not be entirely feasible over a Web study, existing shopping kiosks at Malls and boutique stores can be retrofitted with this system to improve customer service and experience, hence leading to improve sales.

Overall, Morphing is an exciting idea that reaps the benefits from advances in various research disciplines such as Marketing, Artificial Intelligence, and Statistics. Further theoretical and technological advances in these areas will help make Morphing technologies to be more commonplace in society.

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Appendix A

Morphing Projects Guide

This chapter gives a brief overview of the three different Morphing Web site Projects.

A.1 BT Morphing Web site Project

A.1.1 Prototype 1

Prototype 1 was built by RA's Min Zhang and Aman Narang in 2005-2006. This version does not use the Bayesian Inference Engine or the Gittins' Index Engine. It was during this phase that we first identified the need to build a scalable Web Morphing System like the one described in this thesis in order to handle high number of morphs, such as the case with Prototype 2. Instead of using the sophisticated Bayesian Inference Algorithm, this site uses a simple averaging algorithm that calculates the weights of a user's cognitive style. Due to the simplicity of the algorithm, many of the speed issues that were discussed in the thesis do not affect this implementation.

The latest working version of this is at the URL: http://glurban7.mit.edu/8_links3/. The files for this prototype can be found in the `htdocs/` folder within the Apache Software Foundation folder. There is a copy on `advocacy.mit.edu`, but the MySQL database will need to be modified for this to work.

Figure A-1 shows a screenshot of the homepage.

Table A.1 gives a summary of the features of this prototype.



Figure A-1: Screen Shot of Prototype 1's homepage

Attribute	Values
Cognitive Styles	Analytic vs. Holistic Deliberative vs. Impulsive Visual vs. Verbal
Cultural Styles	None
Website Characteristics	Graphical vs. Verbal Focused Content vs. General Content Large Load vs. Small Load of Information
Number of Style Segments (r)	8
Number of Morphs (m)	8
Weighted Morphing Ability	No
Dual Indexing Strategy	No
Uses Bayesian Inference Engine	No
Uses Gittins' Index Engine	No
Uses Averaging Algorithm	Yes
Uses Content Management Engine	No
Field Test Conducted	Great Britain

Table A.1: BT Morphing Web site, Prototype 1 Summary

A.1.2 Prototype 2

BT Prototype 2 was the first attempt to build a fully Morphing Web site using the Mathematical Inference Engine and the Content Management Engine. This was built for the August 2007 Demo for Gavin Patterson, CMO of BT. This site uses the CakePHP MVC Framework and resides under the CakePHP directory.

The latest working version of this is at the URL: http://glurban6.mit.edu/b_t_web_pages/. The files for this prototype can be found in the htdocs/ folder, under the CakePHP app folder. There is a copy on advocacy.mit.edu, but Apache will need to be updated and configured so this site will run smoothly.

Figure A-2 shows a screenshot.

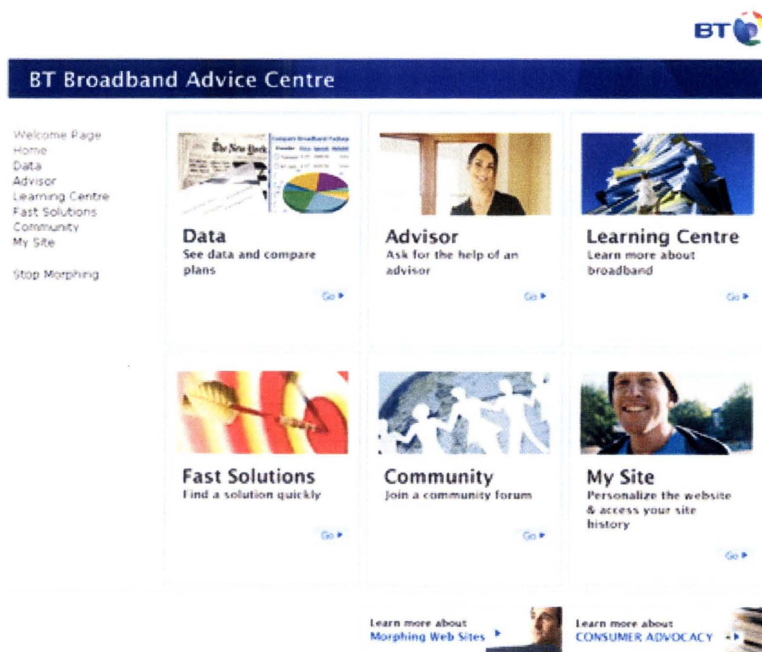


Figure A-2: Screen Shot of Prototype 2's homepage

Table A.2 gives a summary of the features of this prototype.

Attribute	Values
Cognitive Styles	Analytic/Visual vs. Holistic/Verbal Deliberative vs. Impulsive Reader vs. Listener
Cultural Styles	Emotional vs. Neutral Collectivistic vs. Individualistic Hierarchical vs. Egalitarian
Website Characteristics	Graphical vs. Verbal Focused Content vs. General Content Large Load vs. Small Load of Information Lively Color Scheme vs. Neutral Color Scheme Content Addressed to You vs. Content Addressed to General Audience Informal Tone vs. Formal Tone Audio vs. None
Number of Style Segments (r)	64
Number of Morphs (m)	64
Weighted Morphing Ability	No
Dual Indexing Strategy	No
Uses Bayesian Inference Engine	Yes
Uses Gittins' Index Engine	Yes
Uses Averaging Algorithm	No
Uses Content Management Engine	Yes
Field Test Conducted	None

Table A.2: BT Morphing Web site, Prototype 2 Summary

A.2 Suruga Morphing Web site Project

The Suruga Morphing Web site is the an improvement over BT prototype 2 using the Mathematical Inference Engine and the Content Management Engine. The Weighted Morphing Algorithm is also implemented in this version. This site holds the most current Morphing Web System code. This site uses the CakePHP MVC Framework and resides under the CakePHP directory.

The latest working version of this is at the URL: http://glurban6.mit.edu/suruga_web_pages/. The files for this prototype can be found in the htdocs/ folder, under the CakePHP app folder. There is also a working copy at http://advocacy.mit.edu/cp/suruga_web_pages. Note the CakePHP directory on the advocacy.mit.edu server resides under the director cp/.

Figure A-3 shows a screenshot.



Figure A-3: Screen Shot of Suruga's homepage

Table A.3 gives a summary of the features of this prototype.

Attribute	Values
Cognitive Styles	Analytic/Visual vs. Holistic/Verbal Deliberative vs. Impulsive
Cultural Styles	Individualistic vs. Collectivistic Hierarchical vs. Egalitarian
Website Characteristics	Graphical vs. Verbal Large Load vs. Small Load of Information Content Addressed to You vs. Content Addressed to General Audience Informal Tone vs. Formal Tone
Number of Style Segments (r)	16
Number of Morphs (m)	16
Weighted Morphing Ability	Yes
Dual Indexing Strategy	No
Uses Bayesian Inference Engine	Yes
Uses Gittins' Index Engine	Yes
Uses Averaging Algorithm	No
Uses Content Management Engine	Yes
Field Test Conducted	Tokyo, Japan

Table A.3: Suruga Morphing Web site, Prototype 1 Summary

Appendix B

Bayesian Inference Engine and Gittins' Index Engine Parameter Estimation

The following items need to be estimated for the full Morphing Prototype.

1. Ω Matrix - an example of the estimation and specification of this quantity is attached. Note that this quantity changes as the dimensions of the vectors c_{kjn} and r_n changes. The STATA code for MLE estimation and BUGS code for Bayesian estimation are included as well. For more information, please refer to Professor Guilherme Liberali.
2. P_{rm} - an example of the calculation of this quantity is given in the attached excel file. This is an example of the calculation done for the latest Suruga Prototype. To estimate these quantities, one must conduct Factor Analysis to finalize the Style and Morph dimensions. Then, use Univariate ANOVA to pick out the significant variables. Lastly, use Stepwise Regression to find the coefficients for each of the variables (Styles, Morphs, and Matches.) The results P_{rm} are calculated using a the binary logit formula. Please refer to `suruga_prm_calculation_256_041508.xls` for more details on the P_{rm} . For examples of the Factor Analysis, ANOVA and Stepwise Regressions, please refer

to the SPSS output files in the Appendix Chapter “Suruga Project Documents.”

3. α and β - these items needs to be calculated from the P_{rm} . Once the P_{rm} 's are calculated, one can using equation 5.5 and the total number of respondents in each r - m cell ($\alpha + \beta$).
4. $G_{rm}(\alpha, \beta)$ - the MATLAB code for estimating the Gittins' Indices as well as the specification for the Gittins' Table are included. This is prepared by Theta Aye and Guilherme Liberali.

By Guilherme Liberali

May 2007

BT Prototype 1

Example of C, Omega, and R

$$\vec{c} = (c_1 \ c_2 \ c_3 \ c_4 \ c_5 \ c_6 \ c_7 \ c_8 \ c_9 \ c_{10} \ c_{11} \ c_{12} \ c_{13} \ c_{14})$$

c_1 = Graph vs. Verbal

c_2 = Small vs Large Load

c_3 = Focused vs. General Content

c_4 = Listen link vs no-listen link

c_5 = "About BT" link (to check exploration behavior)

c_6 = "Column heading" link

c_7 = Tool link: 1 if it is a link to one of the following tools: select & compare, graph, feedback, or recommendation.

c_8 = "Read Post" link: 1 if it is a link to read a post

c_9 = "Post a comment" link: 1 if it is a link to post a comment

c_{10} = "Open history" click: to detect users having a hard time browsing the site

c_{11} = dummy for compare plans (c_{10} = 0 after the first click)

c_{12} = dummy for advisor (c_{11} = 0 after the first click)

c_{13} = dummy for community (c_{12} = 0 after the first click)

c_{14} = dummy for learning center (c_{13} = 0 after the first click)

$$\vec{r} = (r_1 \ r_2 \ r_3 \ r_{14})$$

r_1 = impulsive vs. deliberative

r_2 = analytic/visual vs. holistic/verbal

r_3 = leader versus follower

r_4 = (active) reader vs. (passive) listener

OMEGA

$$(c_1 \ c_2 \ c_3 \ c_4 \ c_5 \ c_6 \ c_7 \ c_8 \ c_9 \ c_{10} \ c_{11} \ c_{12} \ c_{13} \ c_{14}) \begin{pmatrix} \varpi_{1,1} & \varpi_{1,2} & \varpi_{1,3} & \varpi_{1,4} \\ \varpi_{2,1} & \varpi_{2,2} & \varpi_{2,3} & \varpi_{2,4} \\ \varpi_{3,1} & \varpi_{3,2} & \varpi_{3,3} & \varpi_{3,4} \\ \varpi_{4,1} & \varpi_{4,2} & \varpi_{4,3} & \varpi_{4,4} \\ \varpi_{5,1} & \varpi_{5,2} & \varpi_{5,3} & \varpi_{5,4} \\ \varpi_{6,1} & \varpi_{6,2} & \varpi_{6,3} & \varpi_{6,4} \\ \varpi_{7,1} & \varpi_{7,2} & \varpi_{7,3} & \varpi_{7,4} \\ \varpi_{8,1} & \varpi_{8,2} & \varpi_{8,3} & \varpi_{8,4} \\ \varpi_{9,1} & \varpi_{9,2} & \varpi_{9,3} & \varpi_{9,4} \\ \varpi_{10,1} & \varpi_{10,2} & \varpi_{10,3} & \varpi_{10,4} \\ \varpi_{11,1} & \varpi_{11,2} & \varpi_{11,3} & \varpi_{11,4} \\ \varpi_{12,1} & \varpi_{12,2} & \varpi_{12,3} & \varpi_{12,4} \\ \varpi_{13,1} & \varpi_{13,2} & \varpi_{13,3} & \varpi_{13,4} \\ \varpi_{14,1} & \varpi_{14,2} & \varpi_{14,3} & \varpi_{14,4} \end{pmatrix} (r_1 \ r_2 \ r_3 \ r_{14})$$

CURRENT RESULTS

Omega

$$\text{Cognitive part (first 3 rows):} \begin{pmatrix} 0.446 & 0.5413 & 0.2852 & -0.5066 \\ -0.3558 & -0.1911 & -0.1447 & 0.1666 \\ -0.7653 & -0.1953 & 0.3432 & -0.2804 \end{pmatrix}$$

$$\text{Non-Cognitive part (last rows):} \begin{pmatrix} 0.5672 & 0.6707 & 0.06501 & 0.01533 \\ -0.0925 & -0.2766 & -0.2432 & -0.02212 \\ -0.131 & -0.08056 & -0.1808 & -0.04611 \\ 0.1111 & 0.4181 & -0.1282 & 0.0228 \\ 0.2246 & 0.6793 & -0.08172 & 0.05904 \\ -0.07299 & -0.2581 & -0.2541 & -0.01591 \\ -0.1089 & -0.2853 & -0.2451 & -0.02813 \\ 0.3757 & 0.6895 & 0.02691 & 0.03462 \\ 0.08624 & -0.07977 & -0.2285 & -0.05092 \\ -0.07228 & -0.2841 & -0.1886 & -0.05249 \\ -0.1062 & -0.2337 & -0.21 & -0.01898 \end{pmatrix}$$

Bayesian Estimation Code in WinBUGS

MODEL SPEC - COGNITIVE PART OF OMEGA

```
model{
for (h in 1:M){
  for (pa in 1:8) { # loop around pairs
    deltaU[h,pa] ~ dnorm(dU[h,pa], precU)
    dU[h,pa] <- inprod(deltaCBeta[h, pa, 1:4], r[h, 1:4] )
    deltaCBeta[h,pa,1] <- inprod(deltaC[h,pa,1:3], BetaMatrix1[1:3] )
    deltaCBeta[h,pa,2] <- inprod(deltaC[h,pa,1:3], BetaMatrix2[1:3] )
    deltaCBeta[h,pa,3] <- inprod(deltaC[h,pa,1:3], BetaMatrix3[1:3] )
    deltaCBeta[h,pa,4] <- inprod(deltaC[h,pa,1:3], BetaMatrix4[1:3] )
  } # close pa loop

  for (click in 1: numclicks[h]) # loop around clicks per respondent
    {Y[h,click] ~ dcat(p[h, click, 1: numoptions[h,click] ] )
    for (opt in 1: numoptions[h,click] ) { # choicest loop (changes with respondent)
      p[h,click,opt] <- cbr[h, click, opt] / sum(cbr[h, click, 1: numoptions[h,click] ] )
      log(cbr[h,click,opt] ) <- inprod(CBeta[choicest[h,click], opt, morph[h], 1:4], r[h,1:4] ) / scale_par }
    } # close click loop
  } # close h loop

  # describe all choicestsets in site structure
  for (page in 1: 15) # loop over all pages
    { for (m in 1:8) # loop over all morphs
      { for (option in 1: tot_options[page, m] )
        { CBeta[page, option, m, 1] <- inprod(c_kjm [page, option, m, 1:3], BetaMatrix1 [1:3] )
          CBeta[page, option, m, 2] <- inprod(c_kjm [page, option, m, 1:3], BetaMatrix2 [1:3] )
          CBeta[page, option, m, 3] <- inprod(c_kjm [page, option, m, 1:3], BetaMatrix3 [1:3] )
          CBeta[page, option, m, 4] <- inprod(c_kjm [page, option, m, 1:3], BetaMatrix4 [1:3] )
        } #close option loop
      } # close m loop
    } # close page loop

  # PRIOR
  BetaMatrix1[1:3] ~ dnorm(Beta[1, 1:3], T[1, 1:3, 1:3] )
  BetaMatrix2[1:3] ~ dnorm(Beta[2, 1:3], T[2, 1:3, 1:3] )
  BetaMatrix3[1:3] ~ dnorm(Beta[3, 1:3], T[3, 1:3, 1:3] )
  BetaMatrix4[1:3] ~ dnorm(Beta[4, 1:3], T[4, 1:3, 1:3] )

  # HYPERPRIOR
  for (i in 1:4) {
    Beta[i, 1:3] ~ dnorm(mn[1:3], prec[1:3, 1:3] )
    T[i, 1:3, 1:3] ~ dwish(R[1:3, 1:3], 3)
  }
  PI <- 3.1415926535897932384626433832795
  scale_par <- (sqrt(12)*SD)/PI
  precU <- 1/pow(SD,2)
}
```

```
SD-dnorm(0, 0.25)  
}
```

NON-COGNITIVE PART

```
# Morphing Sites
# PRIMING - Functional and site area parts of beta (beta is 11x4 )

model{
  for (h in 1:M){ # loop around respondents

    for ( click in 1: numclicks[h]) # loop around clicks per respondent
    {
      Y[h,click] ~ dcat(p[h, click, 1: numoptions[h,click ]])

      for (opt in 1: numoptions[h,click]) # choicset loop (changes with respondent) # instead of numoptions use j in c_kjm
      {
        p[h,click,opt] <- cbr[h, click, opt] / sum(cbr[h, click, 1: numoptions[h,click] ])
        log(cbr[h,click,opt] ) <- inprod(CBeta[choiceset[h,click, opt, morph[h], 1:4], r[h,1:4] )
      }
      LL[h,click]<-log(p[h,click,Y[h,click]])
    }
  } # close click loop
  LL2[h] <-sum(LL[h,1:numclicks[h]]) # loglikelihood for household h

} # close h loop

# describe all choicsets in site structure
for (page in 1: 15) # loop over all pages
{ for (m in 1:8) # loop over all morphs
  { for (option in 1: tot_options[page, m] )
    {
      CBeta[page, option, m,1] <- inprod(c_kjm [page, option, m,4:14], BetaMatrix1 [1:11] )
      CBeta[page, option, m,2] <- inprod(c_kjm [page, option, m,4:14], BetaMatrix2 [1:11] )
      CBeta[page, option, m,3] <- inprod(c_kjm [page, option, m,4:14], BetaMatrix3 [1:11] )
      CBeta[page, option, m,4] <- inprod(c_kjm [page, option, m,4:14], BetaMatrix4 [1:11] )
    } } }
# PRIOR
BetaMatrix1[1:11]~dmnorm(Beta[1,1:11], T[1,1:11,1:11] )
BetaMatrix2[1:11]~dmnorm(Beta[2,1:11], T[2,1:11,1:11] )
BetaMatrix3[1:11]~dmnorm(Beta[3,1:11], T[3,1:11,1:11] )
BetaMatrix4[1:11]~dmnorm(Beta[4,1:11], T[4,1:11,1:11] )
LL3<-sum(LL2[]) # global loglikelihood

# HYPERPRIOR:
for (i in 1:4) {
  Beta[,1:11] ~ dmnorm(mn[1:11], prec[1:11,1:11] )
  T[,1:11,1:11] ~ dwish(R[1:11,1:11], 11)
}
}
```

```

/* Below is the Code for estimating the Omega for Suruga */
/* By Guilherme Liberali */
/* This runs in the statistical software STATA */
/* For an example of the dataset, refer to example of dataset.csv */

clear
set matsize 150
set logtype text

/* load data created with gamma= 0.2 */

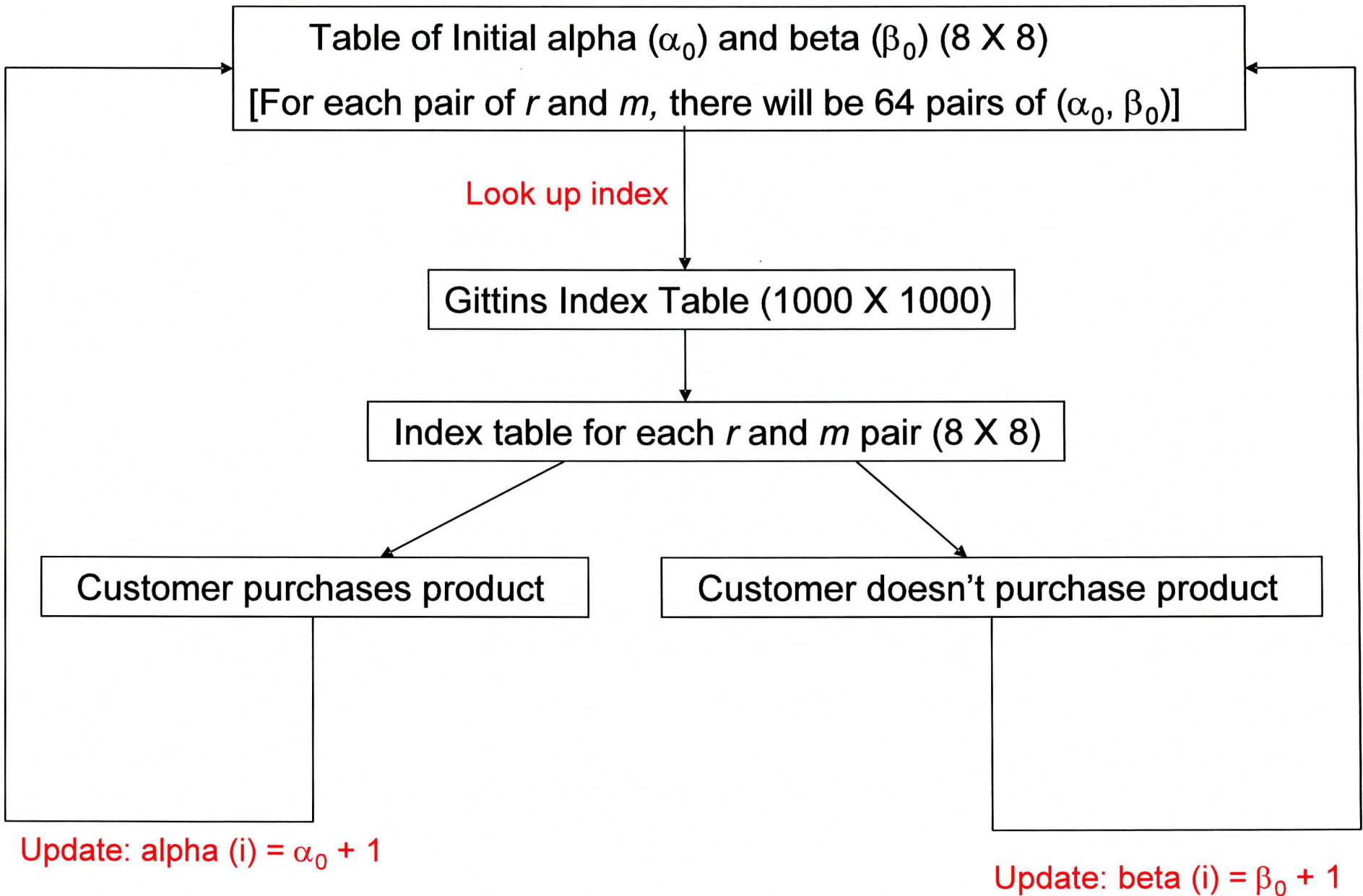
/*insheet using "C:\Documents and Settings\Windows\My Documents\Project_Suruga\omega\suruga
no fixed effect.csv" */
insheet using "suruga2.csv"

/*
*/
/* PARAMETERS
*/
/*
*/
/* log using "C:\Documents and Settings\Windows\My Documents\Project_Suruga\omega\result.txt" */
log using "omega_result_no_fixed_2.txt"

/* call clogit */
/* no fixed effect */
clogit y r1c1omega11 r1c2omega21 r1c3omega31 r1c4omega41 r1c5omega51 ↵
r1c6omega61 r1c7omega71 r1c8omega81 r2c1omega12 r2c2omega22 ↵
r2c3omega32 r2c4omega42 r2c5omega52 r2c6omega62 r2c7omega72 ↵
r2c8omega82 r3c1omega1_3 r3c2omega2_3 r3c3omega3_3 r3c4omega4_3 ↵
r3c5omega5_3 r3c6omega6_3 r3c7omega73 r3c8omega83 r4c1omega1_4 ↵
r4c2omega2_4 r4c3omega3_4 r4c4omega4_4 r4c5omega5_4 r4c6omega6_4 ↵
r4c7omega7_4 r4c8omega8_4 , group(grp)

/* fixed effect */
clogit y r0c1omega10 r0c2omega20 r0c3omega30 r0c4omega40 r0c5omega50 r0c6omega60 r0c7omega70 ↵
r0c8omega80 r1c1omega11 r1c2omega21 r1c3omega31 r1c4omega41 r1c5omega51 ↵
r1c6omega61 r1c7omega71 r1c8omega81 r2c1omega12 r2c2omega22 ↵
r2c3omega32 r2c4omega42 r2c5omega52 r2c6omega62 r2c7omega72 ↵
r2c8omega82 r3c1omega1_3 r3c2omega2_3 r3c3omega3_3 r3c4omega4_3 ↵
r3c5omega5_3 r3c6omega6_3 r3c7omega73 r3c8omega83 r4c1omega1_4 ↵
r4c2omega2_4 r4c3omega3_4 r4c4omega4_4 r4c5omega5_4 r4c6omega6_4 ↵
r4c7omega7_4 r4c8omega8_4 , group(grp)
log close
clear

```




```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%% This program calculates Gittins indices for the      %%%
%%% Bernoulli reward process. It is based on the      %%%
%%% recursion in Gittins (1989), p. 8-9.              %%%
%%%                                                    %%%
%%%                                                    %%%
%%%                                                    %%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%% Initialize %%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

```
% Set parameters for search routine
a = .9999;          % discount rate
N = 300;           % number of iterations
step = 0.0001;    % Step-size
```

```
% Initialize matrices
R = zeros(N-1,N-1); % Array with intermediate values
Reward = zeros(N-1,N-1); % Array with final Gittins Indices
```

```
% Initialize endpoints (starting points for backward induction)
for alpha = 1:N-1
    R(alpha,N-alpha) = alpha/N ; % initialize endpoints at E[betaprior(alpha,beta)]
end
```

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%% main loop %%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

```
for p = step/2:step:1
```

```
    % Continuation value for 'safe' arm
    safe = p/(1-a);
```

```
for M = N-1:-1:2
for alpha = 1:M-1
```

```
    % Continuation value for 'risky' arm
    risky = alpha/M * (1 + a * R(alpha+1,M-alpha)) + (M-alpha) / M * (a * R(alpha,M-1) + R(alpha+1));
```

```
    % 'safe' increases faster than 'risky' in p, so
    % the first time safe > risky, we got the index
    if (Reward(alpha,M-alpha) == 0) && (safe > risky)
        Reward(alpha,M-alpha) = p-step/2;
    end
```

```
    % Update recursion
```

```
R(alpha,M-alpha) = max(safe, risky);
```

```
end  
end  
end
```

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%  
%%% Output results %%%  
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

```
% Note, that it outputs the transpose of the matrix to  
% be consistent with the tables in Gittens (1989)
```

```
% Set output ranges  
alpha_out = 1:100;  
beta_out = 1:100;
```

```
G = [ 0 alpha_out ; beta_out' Reward(alpha_out,beta_out)' ]
```

Appendix C

Weighted Morphing

The following documents are prepared by Professor Guilherme Liberali. They will describe the theory of the Weighted Morphing Algorithm in depth and should be referred to for implementation.

December, 4th, 2007

Morphing Engine – The Suruga Application

This updated note discusses the conceptual and operational aspects of morphing. The idea is to facilitate the development and deployment of the Suruga Bank application of the morphing method. The general approach is:

- 1) The site will learn from every single click
- 2) The site will morph after a threshold has been reached
- 3) The site will morph more than once per session

We have been addressing the conceptual and analytical aspects of these three principles. The first item was solved in our first BT application, and it has already been implemented in our PHP website. The conceptual and analytical aspects of item #2 and item #3 have been addressed recently. However, its implementation has not been fully detailed yet, so it is the focus of the next section.

Suruga Algorithm

1. Assign the best morph m conditional on not knowing the user style. The best morph in Suruga will be identified in the 500-subject fixed morph survey that will done in the first part of the study.
2. For every click made by respondent n we do the following (subscript n was omitted in this subsection for clarity purposes)
 - a. Observe a click

Detailing the Dual-index Approach

The dual-index multiple morphing solution is based on the Generalized Index Heuristics (GIH), proposed by Dusonchet and Hongler (2003) and Asawa (1996). The GIH uses a continuation index (vc_{rnn}) and a switching index (vs_{rnn}). In short, the heuristics is: continue engaging morph m while its continuation index is higher than switching index for all other morphs, that is: $vc_{rnn} \geq vs_{rkn}, \forall k \neq m$. When the switching index for any other morph is higher then the continuation index for the current morph, switch to the morph having the largest switching index.

1. Computing the Indices

Now we have two Bellman equations. One equation has switching costs, and gives us vs_{rnn} . The other has no switching costs and gives us vc_{rnn} . Both are described next.

Computing the Switching Index vs_{rnn}

First, we need a way to incorporate switching costs into the value of the morph, that is, its Gittins' index. Dusonchet and Hongler (2003) assumed that costs did not change with morphs (projects) nor with the number of times that the system changes between projects. We take a step further, by modeling costs as an exponential function of the number of morph changes¹.

In our switching cost index formulation, the arm with known probability is given by vs_{rnn} and the arm with unknown probability is given by the beta distribution. The selection between both arms is given by the solution of the following bellman equation:

¹ Dusonchet and Hongler proved that the dual-index solution using fixed costs is still an indexable bandit problem. We might want to discuss in the paper why we believe the variable cost approach still yields a quasi-optimal solution,

Updates to the Morphing Engine

A full-morphing implementation has to deal with two important challenges. First, it must take into account that a person might have been exposed to multiple morphs while using the site. This means that, at the end of each browsing session, the system must give the correct credit for successes or failures, proportionally to all morphs seen (recall that we use past successes and failures to learn across users). Second, the site must avoid the morph confusion that might emerge from changing morphs too often. As an extreme example of excessive morphing, think of a person having to adapt to a different version of Excel after every click! Additionally, consider that many users have reportedly not been able or willing to adapt to Excel 2007 even after days or weeks of continued usage.

A good way to deal with these challenges is to use a weighting function ζ and to introduce switching costs into our application of the Gittins' index. The former takes care of the exposure to multiple morphs. The latter reduces morph confusion by penalizing morph changes.

Weighting

The intuition for the weighting function is that the system now recognizes the fact that if a person purchased after being exposed to, say, two different morphs, then we must credit this success proportionally to each morph he saw. There are multiple ways of doing this. To keep things simple and yet robust we can use the number of clicks per morphs as the weighting criterion. Let's take a closer look at how we can do it. In the current PHP site implementation we learn from success and failure by adding 1.0 to the alpha (success) or beta (failure) table entry that corresponds to the only morph a user was exposed to. With the weighting function we now do it proportionally to all morphs a person saw. This means that, for example, if a person purchased after being exposed to morph 7 for 20% of the total number of clicks in his clickstream and was exposed to morph 9 for 80% of the clickstream, then the system now must credit 0.2 to the alpha table entry that corresponds to morph 7 and 0.8 to alpha table entry that corresponds to

Appendix D

Source Code and Site Testing Simulation

There are two main files that holds the code for the Bayesian Inference Engine and the Gittins' Index Engine. They are:

1. `bayesian_engine.php`
2. `gittins_index_engine.php`

These two files are stored as CakePHP components in the folder found in CakePHP directory `app\controllers\components\`.

The following document is prepared by Professor Guilherme Liberali, and it discusses testing the Morphing Web site using simulation.

Testing the Multiple Morphing Site

We have already tested the Bayesian engine. Now we need to test the Gittins' engine and the integration of both. Testing the morphing site means learning how the actual real site and the morphing implementation behave in a realistic situation of many users. Recall that our method is based on learning across clicks and across users. In practice, it is not feasible to manually simulate hundreds or thousands of customers. On the other hand, testing only with a couple of customers would not make sense, as the heart of the Gittins' simulation lays on learning from successes and failures over multiple users.

Clicking the site manually might give us face validity, but I think (and you might want to confirm this with Glen) we now want to check the algorithm validity in depth. If so, I believe we need to use or code a simple test environment that can (1) easily generate clicks for thousands of users in our real site (2) activate the updating after each click and after each user and (3) track the results such as the morphs served per cognitive style, the average purchase probability per cognitive style and the evolution of the Gittins' index.

This note presents the overall algorithm for such testing environment. It assumes that the site is tracking properly all necessary information and that the site morphs multiple times as discussed in the Dec.4th note.

Test Procedures and Results

The simulation steps are detailed later. In short, start by assuming we know the probability of purchase for each morph for each style (this information will come later from the “pre-post purchase likelihood measurement” measures in Suruga field study). Next, simulate a customer by randomly choosing one cognitive style. Then generate data (clicks) and run the Bayesian updater after each simulated click, and observe what are the morphs that the system serves up to each synthetic customer during his browsing experience. Finally we observe each user’s purchase behavior, update alpha or beta accordingly and repeat this process until we have 5000 customers per cognitive style.

We expect that, after a few thousands customers have gone through the site, the system will have learned the best morph for this each cognitive style and stabilized. After we reach 5000 customers per style, and plot the morphs chosen by the system for each sequential customer within one specific cognitive style we should get something like this.

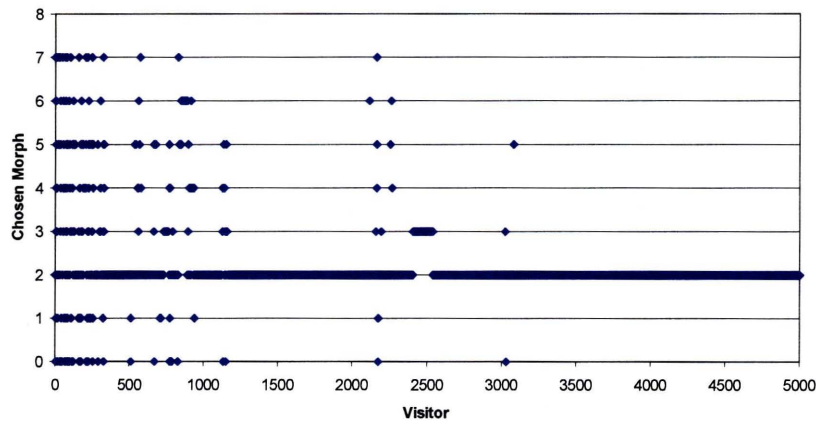


Fig. 1 – Morphs chosen by the system for a cognitive style

As Figure 1 shows, after a couple thousand customers one morph clearly dominates the others.

Finally, the plot of the Gittins' index for all morphs should reflect the fact that the system learns the optimal morph as the number of customers increases, so it should look like this:

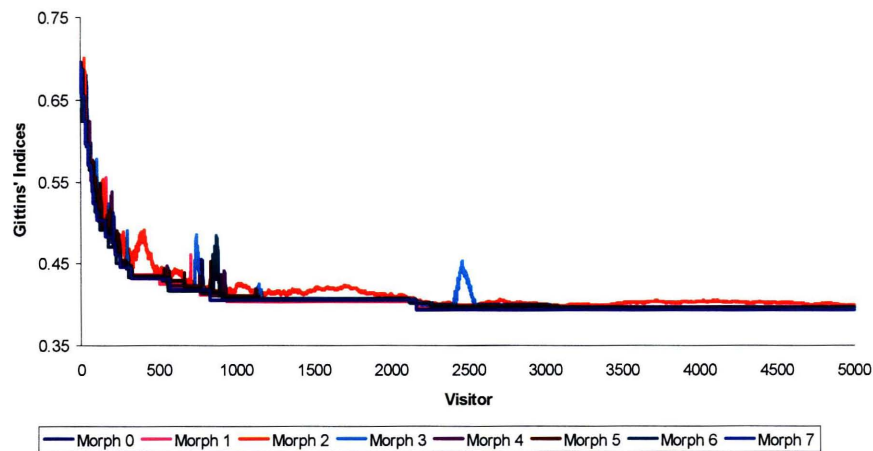


Fig. 2 – Gittins' Index evolution

Testing Steps

1. Define clickstream length. The efficient length depends on website design, but we expect that $K=10$ should be plenty and is a good starting point.
2. Do the following for 1..n customers, where $n= 5000$ customers x number of cognitive segments
 - a. Create a user
 - b. Choose randomly one cognitive style r . Call this the "current user true cognitive style".

- c. Assign the best morph given that we do not know the user style.

For now assume it is morph 2(the best unconditional morph will be found when we look at the Suruga field data)

- d. For each of the 1..k clicks for this user n do the following

- i. Compute click probabilities for current morph, and all J links within current page. Since we know r, k, j, Ω , c_{kj} and m,

the probabilities are given by
$$p_{kjm} = \left[\frac{\exp(\vec{c}_{kjm} \Omega \vec{r})}{\sum_s \exp(\vec{c}_{ksm} \Omega \vec{r})} \right]$$

- ii. Choose an area to click by drawing each click from all the probabilities considering all J links available in the current page. The click probabilities were found in the previous step

I assume the next steps are already coded into the Suruga Site. They are listed in the Dec.4th note

- iii. Observe a click
iv. Run the extant Bayesian updater. It should use the following

$$\text{equation: } q_{\vec{r}} = f(\vec{r} | \vec{y}_n, \vec{c}_{kjm}, \Omega) = \frac{\prod_{k=1}^{K_n} \prod_{j=1}^{J_k} f(\vec{y}_k | \vec{c}_{kjm}, \Omega, \vec{r}) q_o(\vec{r})}{\prod_{k=1}^{K_n} \prod_{j=1}^{J_k} \sum_{r_o=0}^{15} f(\vec{y}_k | \vec{c}_{kjm}, \Omega, \vec{r}) q_o(\vec{r}_o)}$$

- v. Look up Gittins' index, EG_m , for all morphs using the posterior probabilities q as follows:

$$EG_m = \sum_{r=0}^{15} q_r G_{rm}(\alpha_{rm}, \beta_{rm})$$

- vi. Find $m = \text{argmax}_m EG_m(\cdot)$

- vii. Compute the posterior probability of purchase for user n conditional on our beliefs about his cognitive style (the vector q) and conditional on the morphs user n was exposed to until now (expressed in ζ), as follows:

$$p(\text{purchase}_n | q, \zeta_n) = \sum_{i=1}^8 \zeta_{in} p_{irm}$$

- viii. If the purchase probability is above a minimum threshold, morph the site to m . The threshold will be discovered after we analyze the Suruga survey results:

$$\text{Morph if } p(\text{purchase}_n | q, \zeta_n) > \text{threshold}$$

- ix. If the morphing has happened, update ζ_n . Recall that ζ_n is given by the number of clicks a user was exposed to each in morph divided by the total number of clicks observed so far.

e. After the last click, choose a purchase or no-purchase according to a binomial draw using that weighted p_m and the true cognitive style

f. Update Gittins' index by updating alpha or beta for all cognitive styles spreading the weight of the purchase or no-purchase using ζ_m

g. Compute the mean expected purchase probability per cognitive style and plot the chosen morphs x visitors for each cognitive style as in Figure 1, and the evolution of the Gittins' index for each cognitive style as in Figure 2

Appendix E

British Telecommunication Project Documents

The following items are included that is relevant to the BT Project.

1. Morph Map of the Web site Characteristic and Morph Dimensions for the first BT Prototype - This illustrates the idea of Web site Characteristics and Morphs.
2. Professor John Hauser's Substantive Update - this is a followup to the "Website Morphing" paper by Hauser, Urban, Liberali, and Braun[2]. This document describes the classical statistical analysis that Professor Hauser conducted to identify the significant factors that influences Customer Consideration and Purchase for the first BT prototype and field experiment. The Factor Analysis, ANOVA and Stepwise Regressions I conducted for Suruga are based on this document and his SPSS output files (BT SPSS files are not included in the Appendices. Please refer to Professor Hauser or Liberali for those files.)
3. Cultural Styles Literature Review - this report is compiled by Research Assistants Antonio Lorenzon and Harald Solamann. Gives insight on how they generated the Cultural Styles for BT Prototype 2.

MORPH MAP

		Graphical	Verbal
Focused Content	Large load of information	MORPH 1 <ul style="list-style-type: none"> • Graphs & diagrams • Advisor: publisher • Learning Center: technical topics • Lots of information 	MORPH 2 <ul style="list-style-type: none"> • Listen button & texts • Advisor: publisher • Learning Center: technical topics • Lots of information
	Small load of information	MORPH 3 <ul style="list-style-type: none"> • Graphs & diagrams • Advisor: publisher • Learning Center: technical topics • Just a bit of information 	MORPH 4 <ul style="list-style-type: none"> • Listen button & texts • Advisor: publisher • Learning Center: technical topics • Just a bit of information
General Content	Large load of information	MORPH 5 <ul style="list-style-type: none"> • Graphs & diagrams • Advisor: student • Learning Center: general topics • Lots of information 	MORPH 6 <ul style="list-style-type: none"> • Listen button & texts • Advisor: student • Learning Center: general topics • Lots of information
	Small load of information	MORPH 7 <ul style="list-style-type: none"> • Graphs & diagrams • Advisor: student • Learning Center: general topics • Just a bit of information 	MORPH 8 <ul style="list-style-type: none"> • Listen button & texts • Advisor: student • Learning Center: general topics • Just a bit of information

John Hauser

May 12, 2007

Substantive Paper on Cognitive States and Morphing

I am excited about the second morphing paper. I think it has the potential to be published of its substantive contributions. I think reviewers will find it quite interesting that morphing by cognitive state can indeed change probabilities. In the Gittins'-based morphing paper we do not emphasize the substantive findings, nor do we spend much time on the measurement. In that paper I am hoping reviewers will cut us some slack and see the aggregate SPSS logit regressions as a reasonable, but practical, implementation step. However, if we have a substantive paper on morphing/cognitive states, I think we have to bring the analysis to the next level.

There is some precedent. With Ken Wisniewski we first published the "theory" of semi-Markov dynamic models in *Management Science*, and then a paper devoted to the details of implementation in *Marketing Science*. Similarly, Steve Gaskin and I published a defender application in *Marketing Science* a year after Steve Shugan and I published the theory. Even with Birger, we first published a theory of response models in *Journal of Marketing Research* and then a year later a justification with consideration sets in the *Journal of Consumer Research*. The latter has been cited much more than the former. I think we can do this paired (or triple) paper strategy with morphing.

If we write a paper with substantive results, the full Bayesian formulation, and an analysis of the optimal time to morph, the second paper should easily be an "A" publication. Because I am closest to the SPSS analysis, I've written this document to bring everyone else up to speed. It is fairly straightforward analytically. The real effort is getting a model that fits statistically and has face validity.

Dependent Measures

In the priming study, we randomly assigned morphs to respondents and we measured their cognitive states. For each of sixteen cognitive states and for each of eight morphs we observe for each respondent in the cognitive-state-morph combination:

- whether the respondent considers BT (this is a 0-1 variable)
- if they consider BT, the probability that they would purchase a BT plan
 - this is a 0-100 purchase probability, which we can scale 0 to 1.0

- some respondents give BT 100 points, which we interpret a 1.0 probability of purchasing
 - some respondents only consider BT, in which case the unconditioned probability of purchasing is 1.0
 - if respondents don't consider BT, then the unconditioned probability of purchasing BT is 0.0.

By the rules of conditional probability, we have:

$$(1) p_{rmn} = \Pr\{\text{purchase BT}|r, m\} = \Pr\{\text{purchase BT} \mid \text{consider BT}, r, m\} * \Pr\{\text{consider BT}|r, m\}$$

With a sufficiently large sample size, we could have used the p_{rm} 's that we observed. However, with only 1,111 respondents for $16 \times 8 = 128$ cells, these observed probabilities would be based on very few observations. They seemed to make sense, but it was clear that they were not precisely estimated. I felt it was necessary to build a model to smooth out the observed probabilities.

We have two choices: (1) build a composite model where the explanatory variables affect $\Pr\{\text{purchase BT}\}$ directly or (2) build two models – one model of the consideration process [$\Pr\{\text{consider BT}\}$] and one model of the conditional purchase process [$\Pr\{\text{purchase BT} \mid \text{consider}\}$]. If we choose the latter approach, then we use Equation 1 to get the final predictions. This is what I did in the SPSS model. If we build the two-stage model, then the sample for $\Pr\{\text{purchase BT} \mid \text{consider}\}$ is only those respondents who consider BT. The sample for $\Pr\{\text{consider BT}\}$ is all respondents.

The dependent measures make it difficult to use standard MLE logit packages, because they do not handle fractional purchases. It was also difficult to use standard logit regression with individual-respondent level data [$\ln(p_{rm}/(1-p_{rm}))$ as the dependent measure] because some of the observations are 0.0 or 1.0. I tried changing 0.0 to a small number and 1.0 to $(1 - \text{a small number})$, but the results were too dependent on what I chose for the small number. Fortunately, the theory works for fractional purchases. It is just the packages that cannot handle it.

Using the notation of the text, let

p_n = probability that respondent n chose BT, this can be 0, 1, or a fraction

p_{cn} = probability that respondent n considered BT, this is 0 or 1

p_{sn} = probability that respondent n chose BT given that he/she considered BT, this can be 0, 1, or a fraction. I am “s” as a subscript as a mnemonic for “select,” because “c” for is already used “for consideration.”

We also have data on these probabilities (events) before the respondent saw the website (pre). The above are defined for the after the respondent saw the website (post). Ideally, we would build a pre-website model and then use that to estimate changes. Logically, cognitive states could affect the pre-probabilities. Morphs and matches (see below) cannot affect pre-measures. To avoid propagating error, we would then use estimated pre-probabilities as explanatory variables in the models. Because of regression-to-the-mean issues, the pre-measures should be explanatory variables; we do not want to model the delta probabilities.

I spent a lot of time trying to estimate these pre-post models. They were a bust with the aggregate data. Hardly anything was significant in the first stage, hence the variation in estimated pre-probabilities was minimal. The estimated pre-probabilities were not significant in the second stage. In this note I will ignore the pre-measures. However, we might be able to build better models if we use them.

Independent Measures

There are three types of independent measures: (1) morph characteristics, (2) cognitive state characteristics, and (3) morph-state matches.

Morph characteristics. The morph characteristics were varied randomly for each respondent. They are 0-1 explanatory variables for each of three characteristics:

- graphical vs. verbal (e.g., graphs and pictures vs. text)
- focused vs. general content (e.g., a few recommended plans vs. all plans)
- small-load vs. large-load (e.g., the amount of information presented)

In the paper we index morph by m where $m = 1$ to 7. We can also think of the morph as a binary vector, \vec{m}_n . For example, $\vec{m}_n = \{1,0,0\}$ is a verbal, focused, small-load morph. This vector has an n subscript because each respondents were shown different morphs.

Cognitive states. We did not manipulate respondents’ cognitive states. Rather, we measured their cognitive states with a variety of scales such as the following:

Broadband Usage and Attitude

Now we would like to learn a little bit more about you in order to understand your personal decision style when choosing between options. Please answer to what extent you agree or disagree with the statements below to best represents how you think or feel.

For each statement below, please indicate the number that best indicates your level of agreement using the 5-point scale below.
 [CHOOSE ONE ONLY FOR EACH STATEMENT]

	Strongly Disagree					Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
I prefer to read text rather than to listen to a lecture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I enjoy deciphering graphs, charts, and diagrams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I will read an explanation of a graph/chart before I try to understand the graph/chart on my own	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I see what I read in mental pictures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am detail oriented, and start with the details in order to build a complete picture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tend to see problems in their entirety and start by integrating pieces from different areas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I find it is easy to make decisions for others and to command and direct others to take certain actions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In a group conversation, I usually speak the most	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have held a great deal of leadership positions in my life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My confidence level is higher than most other people's	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NEXT

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We then factor analyzed the scales to produce four factors (the factor matrix is at the end of this note.

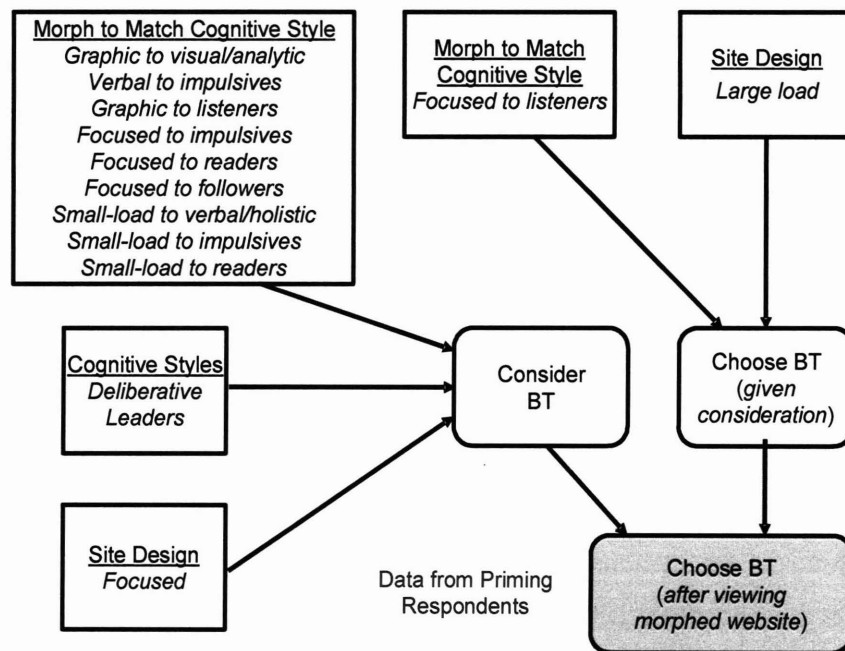
- leader vs. follower
- analytic/visual vs. holistic/verbal
- impulsive vs. deliberative
- (active) reader vs. (passive) listener

We could have built a model that used the factors as explanatory variables. However, the Gittins loop requires that respondents be in discrete states. (This may be relaxed in the future, but I don't think it is trivial to do so. It is a new paper if we can so do.) With Theta's help, we developed four binary variables to indicate a respondent's cognitive state. E.g., a respondent is a "leader" if he/she is above the median on the factor corresponding to leader vs. follower. Using one of our coding schemes (\vec{r}_n^2), the discrete states are given by the vector \vec{r}_n for the n^{th} respondent. For example, $\vec{r}_n = \{0, 1, 1, 0\}$ is a leader who is holistic/verbal, deliberative, and an active reader.

Matches. The last set of explanatory variables are the matches. These are the variables in which we are most interested. There are $3 \times 4 \times 2$ possible matches. A respondent will have seen three morph characteristics, will have had four cognitive states characteristics, and the match could have occurred in one of two directions. For example, one match might be that the

respondent saw a graphical morph and was a leader (and verbal with follower) while another match might be when a respondent saw a verbal morph and was a leader (and graphical with follower). Call these binary vectors, \vec{z}_n , for the n^{th} respondent. This vector varies by respondent because each respondent has a different cognitive state and was (randomly) shown different morphs, hence, each respondent can have different matches. It is easy to build the \vec{z}_n vector from the \vec{r}_n and \vec{m}_n vectors, however, \vec{z}_n is not collinear with \vec{r}_n and \vec{m}_n .

In the aggregate SPSS model, I only had $16 \times 8 = 128$ observations. It would have been crazy to include all matches in the model. I used ANOVA to identify the matches most likely to be significant and then stepwise regression to build the model. ANOVA also told me whether interactions might be significant – they weren't. In building a logit model, we will have to be very careful not to over-fit the data. It might be best to start with the specification in the paper. This is given below (reproduced from the paper).



The explanatory variables that were significant are shown in the boxes. For example, the cognitive style, “deliberative,” was significant in the model of $\Pr\{\text{consider BT}\}$. The morph “large load” was significant in the model of $\Pr\{\text{choose BT} \mid \text{consider BT}\}$, as was the match, “focused morph to respondents who were listeners.”

The Logit Model

The model is a simple binary logit. If we define weights, \vec{w}_m , \vec{w}_r , \vec{w}_z , for morphs, cognitive states, and matches, respectively, then we want to estimate the following model. Naturally, we will need to test a variety of models to identify the best one – a model that has significant coefficients and has face validity. (I think of face validity as an implicit Bayesian criterion where we override random error with intuition.) In the following equations, I use capital P's for the logit model probabilities so that the likelihood function is unambiguous. Equation 2a is the two-step model; Equation 2b is the one-step model.

$$(2a) \quad P_{cn} = \frac{\exp((\vec{w}_{cm}' \vec{m}_n + \vec{w}_{cr}' \vec{r}_n + \vec{w}_{cz}' \vec{z}_n)}{1 + \exp((\vec{w}_{cm}' \vec{m}_n + \vec{w}_{cr}' \vec{r}_n + \vec{w}_{cz}' \vec{z}_n)}$$

$$P_{sn} = \frac{\exp((\vec{w}_{sm}' \vec{m}_n + \vec{w}_{sr}' \vec{r}_n + \vec{w}_{sz}' \vec{z}_n)}{1 + \exp((\vec{w}_{sm}' \vec{m}_n + \vec{w}_{sr}' \vec{r}_n + \vec{w}_{sz}' \vec{z}_n)}$$

$$P_n = P_{cn} P_{sn}$$

or

$$(2b) \quad P_n = \frac{\exp((\vec{w}_m' \vec{m}_n + \vec{w}_r' \vec{r}_n + \vec{w}_z' \vec{z}_n)}{1 + \exp((\vec{w}_m' \vec{m}_n + \vec{w}_r' \vec{r}_n + \vec{w}_z' \vec{z}_n)}$$

The Likelihood Function

Whether we use MLE or Bayesian methods, we need a likelihood function. The likelihood function is the standard logit likelihood function. Most statistical packages require the observations to be 0 or 1. This does not have to be the case, the likelihood function is well-defined and can be maximized for fractional dependent measures. The concept is as if we had 100 observations for each respondent. Unfortunately, if we just change the data so that we pretend to observe $100 * p_n$ or $100 * p_{cn}$ and $100 * p_{sn}$ we would over-estimate precisions of the estimators. One kluge would be to use standard packages, multiply the dependent measures by 100 to make the dependent variables integers, estimate the model, and correct the t-statistics. Another way to do this is to write a simple MLE estimator. I am not sure which is easier and I have not worked through the equations to correct the standard errors – they should be straightforward.

Basically, the likelihood functions are:

$$(3) \quad L_c = \sum_n p_{cn} \ln P_{cn} \text{ and } \sum_n p_{sn} \ln P_{sn} \quad \text{or} \quad \sum_n p_n \ln P_n$$

All of the usual considerations apply.

Factor Loadings

This is a five-factor solution based on the scree rule. We did not use the innovator scales to help define cognitive states. There is also a reliability (Cronbach α) tests and three scales (plus the innovator scale) are reasonable. The fifth scale is only one item.

Rotated Component Matrix(a)

	Component				
	1	2	3	4	5
Innovator: take a chance	.209	.071	.599	-.001	.018
Innovator: like to experiment	.019	-.001	-.655	.012	-.172
Innovator: last person to try	-.021	.049	-.607	.030	.125
Innovator: try new things	.079	.189	.761	-.003	-.042
Visual: read rather than listen	.020	.062	.020	.023	.950
Visual: decipher graphs	.116	.529	.080	-.210	.087
Visual: read explanation before graph	-.093	.569	-.116	.139	.140
Visual: mental pictures	.118	.601	.075	.146	-.117
Analytic: detail oriented	.126	.714	.054	-.039	.063
Analytic: see in entirety	.287	.534	.177	-.154	-.179
Command: comand others	.644	.247	.139	-.072	.031
Command: speak first	.760	.040	.021	.085	-.045
Command: leadership	.849	.078	.018	-.034	-.002
Commend: confidence	.824	.081	.133	-.031	.033
Impulsive: bat_ball indicator	-.022	-.007	.034	.651	.039
Impulsive: machine indicator	.024	.056	-.046	.716	-.015
Impulsive: lily indicator	-.027	-.069	-.031	.762	.001

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

Some Musings on the Optimal Time to Morph

The current simulations use synthetic data. However, the parameters of the Bayesian model are based on the priming data. In a substantive paper we will need to give substantive advice on the optimal time or the optimal rules to morph. This means we will have to give some thought about how we represent the \bar{c}_{ijn} 's so that they represent the situation faced by respondents in the priming study.

The morphing strategy is based on the Gittins' loop. However, if we going to study the optimal time to morph, we can assume that the Gittins' loop has enough observations so that it has converged. As the number of respondents goes to infinity, $G_{rmn} \rightarrow p_{rm}$. With this assumption we are solving the optimal-time-to-morph problem at a time when the exploration-exploitation (Gittins) problem has converged to exploitation. Later we might solve both optimization problems simultaneously.

For the paper, we will have to speculate on how a mixed morph will affect respondents. We not have data on mixed morphs because each priming respondent saw only one morph. Also, the entire Gittins' analysis assumes that the respondent sees enough of the new morph so that its characteristics dominate the morph the respondent saw before the website changed. (This is another reason why it is best to start by abstracting from the Gittins' problem.)

Using the notation of the paper, the respondent sees K_n clicks. As a first pass we may need to assume that K_n does not depend on the morph that the respondent sees. This is also another avenue of future research – it is not unreasonable that a matched morph would be more efficient for the respondent.

Let K_{nm} be the number of clicks that the respondent sees of morph m . (This is one modeling decision: using clicks rather than response time.) By definition, $\sum_m K_{nm} = K_n$. We can assume that the effective probability for a respondent in cognitive state r is given by:

$$(4) \quad p_{rm} = \sum_m K_{nm} p_{rm} / K_n$$

To optimize we need to choose a rule, based on what we can observe, to decide when to change from the initial morph to a respondent-specific morph. (It is not hard to show that the initial morph will be the same for all respondents. The initial morph maximizes the expected reward, $\arg \max_m \sum_r q_{ro} p_{rm}$.)

One simple way to explore optimal rules is to simulate them. That is, randomly draw cognitive states according to the priming-population probabilities. Then, simulate respondents making click choices and update the q_{rmk} 's. (I have added a k subscript assuming optimization requires a Bayesian loop after each click.) One rule might be: morph when $\max_r \{q_{rmk}\}$ is above a threshold. Another might be morph when entropy, $\sum_r q_{rmk} \ln(q_{rmk})$, is below a threshold. Other rules might depend upon both the q_{rmk} 's and the p_{rm} 's. It is an interesting and challenging problem. If we can solve it, it will be an interesting contribution. John Hauser, May 12, 2007.

Measures on Morphing Styles

How Hofstede measures cultural dimensions

Hofstede's initial study [Hofstede 1980; Hofstede 1983a; Hofstede 1983b; Hofstede/Bond 1988] used an existing data base from IBM, covering matched populations of employees in national subsidiaries in 64 countries. The data consisted of answers to questionnaires about employee values and perception of the work situation that were collected in the context of two worldwide rounds of employee attitude surveys. The questions in the IBM surveys had been composed from initial in-depth interviews with employees in ten countries and from suggestions by frequent travelers in the international headquarters' staffs who reported on value differences they had noticed among subsidiaries. Table 1 **Error! Reference source not found.** shows how two indexes have been derived based on the data available.

Dimension and Formula for Calculation	Questions	Answers/Scale
Power Distance $PDI = -35m(1) + 35m(2) + 25m(3) - 20m(4) - 20$ [m(1) is the mean score for question 1, m(2) is the mean score for question 2, and so on]	In choosing an ideal job, how important would it be to you to have a good working relationship with your direct superior?	1 = of utmost importance 2 = very important 3 = of moderate importance 4 = of little importance 5 = of very little or no importance
	In choosing an ideal job, how important would it be to be consulted by your direct superior in his/her decisions?	1 = of utmost importance 2 = very important 3 = of moderate importance 4 = of little importance 5 = of very little or no importance
	How frequently, in your experience, are subordinates afraid to express disagreement with their superiors?	1 = never 2 = seldom 3 = sometimes 4 = usually 5 = always
	An organization structure in which certain subordinates have two bosses should be avoided at all costs	1 = strongly agree 2 = agree 3 = undecided 4 = disagree 5 = strongly disagree
Individualism $IDV = -50m(1) + 30m(2) + 20m(3) - 25m(4) + 130$	In choosing an ideal job, how important would it be to have sufficient time for your personal or family life?	1 = of utmost importance 2 = very important 3 = of moderate importance 4 = of little importance 5 = of very little or no importance
	In choosing an ideal job, how important would it be to have good physical working conditions (good ventilation and lighting, adequate work space, etc.)?	1 = of utmost importance 2 = very important 3 = of moderate importance 4 = of little importance 5 = of very little or no importance
	In choosing an ideal job, how	1 = of utmost importance

	important would it be to have security of employment	2 = very important 3 = of moderate importance 4 = of little importance 5 = of very little or no importance
	In choosing an ideal job, how important would it be to have an element of variety and adventure in the job?	1 = of utmost importance 2 = very important 3 = of moderate importance 4 = of little importance 5 = of very little or no importance
Masculinity $MAS = +60m(1) - 20m(2) + 20m(3) - 70m(4) + 100$	In choosing an ideal job, how important would it be to work with people who cooperate well with one another?	1 = of utmost importance 2 = very important 3 = of moderate importance 4 = of little importance 5 = of very little or no importance
	In choosing an ideal job, how important would it be to have an opportunity for advancement to higher level jobs?	1 = of utmost importance 2 = very important 3 = of moderate importance 4 = of little importance 5 = of very little or no importance
	Most people can be trusted	1 = strongly agree 2 = agree 3 = undecided 4 = disagree 5 = strongly disagree
	When people have failed in life it is often their own fault	1 = strongly agree 2 = agree 3 = undecided 4 = disagree 5 = strongly disagree
Uncertainty Avoidance $UAI = +25m(1) + 20m(2) - 50m(3) - 15m(4) + 120$	How often do you feel nervous or tense at work?	1 = never 2 = seldom 3 = sometimes 4 = usually 5 = always
	One can be a good manager without having precise answers to most questions that subordinates may raise about their work	1 = strongly agree 2 = agree 3 = undecided 4 = disagree 5 = strongly disagree
	Competition between employees usually does more harm than good	1 = strongly agree 2 = agree 3 = undecided 4 = disagree 5 = strongly disagree
	A company's or organization's rules should not be broken - not even when the employee thinks it is in the company's best interest	1 = strongly agree 2 = agree 3 = undecided 4 = disagree 5 = strongly disagree
Long-Term Orientation $LTO = -20m(1) + 20m(2) + 40$	In your private life, how important is thrift to you?	1 = of utmost importance 2 = very important 3 = of moderate importance 4 = of little importance 5 = of very little or no importance
	In your private life, how important is respect for tradition to you?	1 = of utmost importance 2 = very important 3 = of moderate importance 4 = of little importance 5 = of very little or no importance

Table 1: Hofstede's Values Survey Model 1994 (VSM 1994)

Wealth (material possessions, money)
National Security (protection of my nation from enemies)
Self-respect (belief in one's own worth)
Reciprocation of Favors (avoidance of indebtedness)
Creativity (uniqueness, imagination)
A World at Peace (free of war and conflict)
Respect for Tradition (preservation of time-honored customs)
Mature Love (deep emotional and spiritual intimacy)
Self-discipline (self-restraint, resistance to temptation)
Detachment (from worldly concerns)
Family Security (safety for loved ones)
Social Recognition (respect, approval by others)
Unity with Nature (fitting into nature)
A Varied Life (filled with challenge, novelty, and change)
Wisdom (a mature understanding of life)
Authority (the right to lead or command)
True Friendship (close, supportive friends)
A World of Beauty (beauty of nature and the arts)
Social Justice (correcting injustice, care for the weak)
Independent (self-reliant, self-sufficient)
Moderate (avoiding extremes of feeling and action)
Loyal (faithful to my friends, group)
Ambitious (hardworking, aspiring)
Broad-minded (tolerant of different ideas and beliefs)
Humble (modest, self-effacing)
Daring (seeking adventure, risk)
Protecting the Environment (preserving nature)

Influential (having an impact on people and events)
Honoring of Parents and Elders (showing respect)
Choosing Own Goals (selecting own purposes)
Healthy (not being sick physically or mentally)
Capable (competent, effective, efficient)
Accepting my Portion in Life (submitting to life's circumstances)
Honest (genuine, sincere)
Preserving my Public Image (protecting my "face")
Obedient (dutiful, meeting obligations)
Intelligent (logical, thinking)
Helpful (working for the welfare of others)
Enjoying Life (enjoying food, sex, leisure, etc.)
Devout (holding to religious faith and belief)
Responsible (dependable, reliable)
Curious (interested in everything, exploring)
Forgiving (willing to pardon others)
Successful (achieving goals)
Clean (neat, tidy)

Table 2: Items of Schwartz's value survey

In each sample, the intercorrelation matrix of Person correlations between the importance ratings of the values was analyzed with the Guttman-Lingoes *Smallest Space Analysis* (SSA). This is a nonmetric multidimensional scaling (MDS) technique for structural analysis of similarity data. This technique represents the values as points in multidimensional space such that distances between the points reflect the empirical relations among values as measured by the correlations between their importance ratings. The greater the conceptual similarity between the two values, the more related they should be empirically, and hence the closer their locations should be in the multidimensional space.

Implications for our project

When analyzing cultural dimension, researchers usually apply survey techniques (however, the research approach of some researchers, e.g. Trompenaars and Hampden-Turner, remains somewhat unclear). The scales used for measuring the survey items vary. For instance, Hofstede uses a five-point scale, whereas Schwartz introduces a nine-point scale. The number of survey items used also varies. For example, Hofstede measures cultural dimension by asking 18 questions. Schwartz's value survey consists of 56 items.

A way of integrating this research approach into our project is to present a questionnaire to the users of the website ("direct approach"). This would allow us to use some of the questions outlined above in order to analyze the user's cultural preferences. A disadvantage of this approach is probably that users usually do not like surveys. Another way is to use the informational choices we already discussed as proxies for the questionnaire items ("indirect approach"). Examples are different types of advisors and language preferences.

Cognitive Variables Measures

Introduction

During the last three decades there has been an increasing interest in cognitive style among management researchers and practitioners. A major problem, however, has been the shortage of valid and reliable measures convenient for a wide using and application.

Cognitive style has been defined as 'consistent individual differences in preferred ways of organizing and processing information and experience' [Messick 1984]. Its relevance to organizational behaviour is clear [Schweiger 1983].

Allison and Hayes [Allinson/Hayes 1996] cite evidence of the value of cognitive style in relation to personnel selection, careers guidance, task design, team composition, conflict management and training and development. Others have demonstrated the appropriateness of certain styles for particular management tasks. Mintzberg [Mintzberg 1976], for example, claims that planning and management science, with their emphasis on logic and articulation, require a rationed cognitive style whereas management at the policy level, which involves coping with ambiguity and complexity, requires a more intuitive approach.

So it's clear there are a lot of complete different approaches and a lot of different measures for the cognitive styles dimensions. It's very hard to find the final questions that had been used to analyse the sample by a questionnaire and the most common ones are under royalties

restriction but it was still possible to look at the literature to identify the main instruments used to develop a cognitive style analysis.

Tests and different approaches:

In the main work on cognitive styles, Allison and Hayes [Allinson/Hayes 1996] explain how the main problem with many established measures of cognitive style is that they are too cumbersome to be applied in large-scale organizational studies. Looking at the literature regarding cognitive style Index and measures it has been possible to identify and summarise four main tests:

- **Matching Familiar Figures Test (MFF)** [Kagan 1966] the commonest method of assessing impulsivity-reflection, also entails timing of response, in this case to the task of matching a standard figure with one of a number of variants. It's a visual test to allow the registration of the first impression people have about their thoughts.

- **The Hermann Brain Dominance Instrument (HBDI)**: [Hermann 1998] it takes the form of a survey consisting of 120 questions to be completed by an individual. They don't have a real time-limit so they can spend as much time as they want on each question.

There 4 different quadrants:

- *A-quadrant* (left cerebral mode) means that a person favours activities that involve logical, analytical and factual information combined with an ability to perceive, verbalise and express information precisely

- *B-quadrant* (left limbic mode) implies similarities to an A-quadrant thinking preference. In both cases a linear approach to activities is taken and ambiguity is rejected. Individuals with a B-quadrant preference favour organised, sequential, planned and detailed information. They are conservative in their actions and like to keep things as they are.

- *C-quadrant* (right limbic mode) indicates a preference for information that is interpersonal, involves emotion (based on feelings) and which is kinaesthetic.

- *D-quadrant* (right cerebral mode) is mainly characterised by a holistic approach.

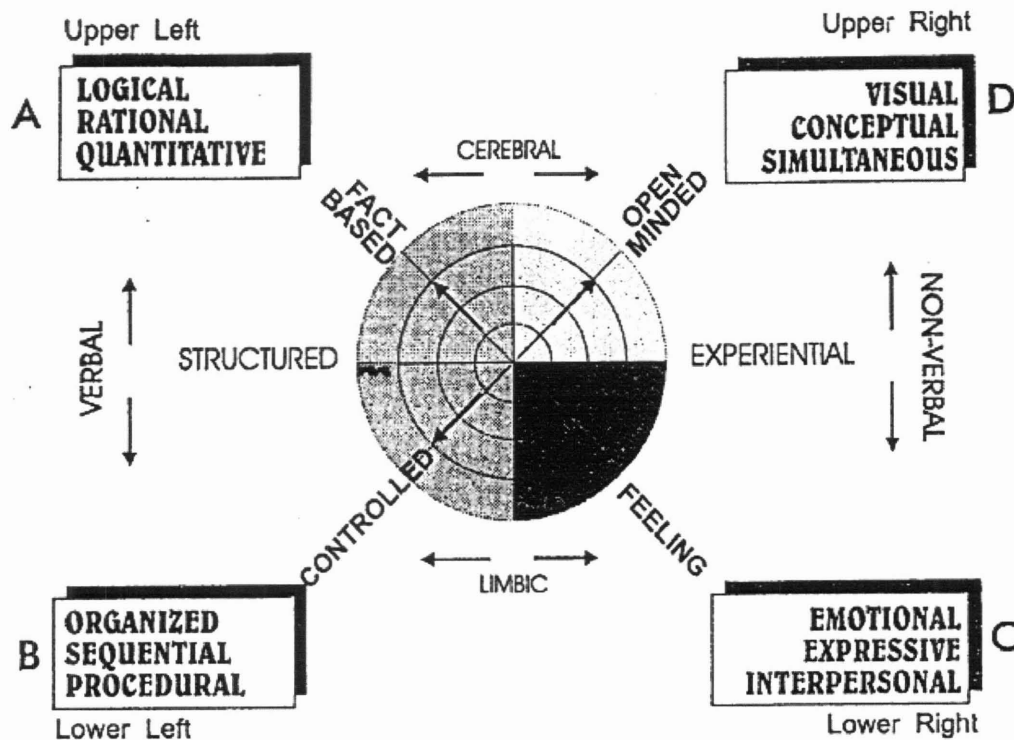


Fig. 1 – Hermann's Cognitive Brain scheme [Hermann 1995]

This test is considered one of the most complete because it's regarding both Analytic and Holistic style (with all their declination) and Verbal and Visual.

- **Myers-Briggs type indicator (MBTI)**: [Myers 1985] it classifies people according to their preference on scales derived from the psychological Carl Jung's theory.

The primary feature of the theory behind the MBTI is that each person's personality fits into only one of 16 types. These categories are based on four features of personality, each consisting of two opposite preferences. According to the theory, all people have an innate preference that determines how they will behave in all situations.

The four dimensions are:

- *Extroversion (E) vs Introversion (I)*. This dimension reflects the perceptual orientation of the individual. Extroverts are said to react to immediate and objective conditions in the environment. Introverts, however, look inward to their internal and subjective reactions to their environment.

- *Sensing (S) vs Intuition (N)*. People with a sensing preference rely on that which can be perceived and are considered to be oriented toward that which is real. People with an intuitive preference rely more on their non-objective and unconscious perceptual processes.
- *Thinking (T) vs Feeling (F)*. A preference for thinking indicates the use of logic and rational processes to make deductions and decide upon action. Feeling represents a preference to make decisions that are based on subjective processes that include emotional reactions to events.
- *Judgment (J) vs Perception (P)*. The judgment-perception preferences were invented by Briggs and Myers to indicate if rational or irrational judgments are dominant when a person is interacting with the environment. The judgmental person uses a combination of thinking and feelings when making decision, whereas the perception person uses the sensing and intuition processes.

- **Learning Style Inventory (LSI)**: [Kolb 1984] learning cycle model represent another conceptual approach to classifying cognitive processing. He states that “*An Orientation toward abstract conceptualization focuses on using logic, idea and concepts. It emphasizes thinking as opposed to feeling while an orientation toward concrete experience focuses on being involved in experiences and dealing with human situations in personal way. It emphasizes feeling as opposed to thinking*”.

The second dimension in Kolb’s learning theory is regarding “active experimentation” versus “reflective observation”. In one of the several perspectives that Kolb offers on his theory he defines this bipolar dimension as “grasping information” and “transforming it”.

Kolb’s four styles are defined by the intersection of his two dimensions:

- *Convergers*: favour abstract conceptualization and active experimentation
- *Divergers*: emphasize reflective observation and concrete experience
- *Accommodators*: value active experimentation and concrete experience
- *Assimilators*: value abstract experimentation and reflective observation.

- **Gregorc Style Delineator (GSD)** [Gregorc 1982] presents the respondent with 10 sets of 4 words. In each set the individual is asked to rank order the words in terms of how well they

describe the respondent. Nevertheless the psychometric soundness of the GSD does not appear to be well-documented.

- **Decision Style Inventory (DSI)** [Rowe/Mason 1987] involves choosing from a set of four phrases the best ending sentence. Twenty sentences and word phrases are presented. Rowe reports significant split-half validity for his measure and reliability correlations between the DSI and other well known measure as MBTI or MFF.

- **Lifescrpts** Christenesen's test consists of 18 sentences completion item with four choices each to be ranked in order of how descriptive they are of subject [Riding/Rayner 1998].

- *The first six sentences are questions about a hypothetical autobiography;*

- *the next six refers to movie based on the book;*

- *and the final six relate to critical responses (from others) to the book and movie.*

Test	Key Dimensions			
MBTI	Thinking	Feeling	Sensation	Intuition
GSD	Abstract - Sequential	Abstract - Random	Concrete - Sequential	Concrete - Random
DSI	Analytic	Holistic	Directive	Conceptual

Tab. 1 - Key Dimensions Comparison Table

Another very significant test has been developed by a British researcher, Riding in 1991. This test is called:

- **Cognitive Style Analysis (CSA)**, [Riding/Cheema 1991] it's a computer-presented test to measure the two fundamental dimensions of Cognitive Styles: Holistic-Analytic and Verbal-Imagery.

The last significant approach is the one developed by Allison and Hayes called:

- **Cognitive Style Index (CSI)**: [Allinson/Hayes 1996] the cerebral hemispheres have the potential to perform many functions, each tends to specialize [Armstrong S. et al. 2004]. The right hemisphere emphasizes synthesis and the simultaneous integration of many inputs at once, and is mainly responsible for spatial orientation and the comprehension of iconic visual images. The left hemisphere emphasizes a primarily linear mode of operation with

information being processed sequentially, and is mainly responsible for logical thought, especially in verbal and mathematical functions.

The terms used to describe right brain and left brain thinking in the present study are 'intuition' and 'analysis', expressions favoured by a number of previous investigators [Agor 1989]; [Hermann 1998]. Intuition, characteristic of the right brain orientation, refers to immediate judgement based on feeling and the adoption of a global perspective. Analysis, characteristic of the left brain orientation, refers to judgement based on mental reasoning and a focus on detail. These right-left patterns are not merely transient; people seem to have a rather permanent stylistic orientation to the use of one hemisphere. Intuitivists (rightbrain dominant) tend to be relatively nonconformist, prefer an open-ended approach to problem solving, rely on random methods of exploration, remember spatial images most easily, and work best with ideas requiring overall assessment.

Analysts (left-brain dominant) tend to be more compliant, favour a structured approach to problem solving, depend on systematic methods of investigation, recall verbal material most readily and are especially comfortable with ideas requiring step by step analysis. A self-report format was adopted for the CSI. Four or five statements were written for each of the dimensions identified by Hayes and Allinson [Allinson/Hayes 1996] resulting in 129 items in all. A trichotomous true-uncertain-false response mode was adopted throughout.

In the item analysis, a score of

- 2 was assigned for a response of true,
- 1 for uncertain and
- 0 for false.

Thirty-eight items, deriving from 18 of the dimensions yielded by the literature search, survived the item analysis to form the final version of the CSI.

Examples are:

- *'Formed plans are more of a hindrance than a help in my work'*
- *'I am most effective when my work involves a clear sequence of tasks to be performed'*
- *'My philosophy is that it is better to be safe than risk being sorry'*
- *'I am inclined to scan through reports rather than read them in detail'*

Twenty-one of the items were worded in such a way that a response of 'true' indicated an analysis orientation. The scoring of the remaining 17 was reversed, therefore, so that the nearer the total CSI score to the theoretical maximum of 76, the more analytical the

respondent, and the nearer the total score to the theoretical minimum of zero, the more intuitive the respondent. Items were placed in random order on the final form.

From their studies it's possible to summarise this comparison between Analytic (left-brain dominant) and Holistic (Right-brain dominant):

Analytic (left-brain dominant)	Holistic (Right-brain dominant)
<ul style="list-style-type: none"> - Solve problems through the use of data. - Perform statistical analysis of data. - Develop solutions using logical analyses of facts. - Have work done by individuals who are assigned to study a system using an orderly approach. - Define quality as conformance to definable requirements that can be measured. - Establish controls in the early stages of a system that will ensure quality is controlled throughout the system's life cycle. - Improve quality by studying specific variation within a system. - Identify root causes of problems by elaborately categorizing possible causes and using strict rules for questioning. 	<ul style="list-style-type: none"> - Solve problems through the understanding of relationships. - Use cause-and effect diagrams. - Develop solutions using creativity and brainstorming. - Have work done by teams that will raise many questions and work multiple issues. - Define quality based on a holistic concept, such as total quality. - View quality as a process for continuous improvement in which controls are only temporary. - Improve quality by starting with a holistic strategic quality plan. - Identify root causes of problems by using the five-whys method, barrier analysis and process diagrams.

Tab.2 – Left-Right Brain [Allinson/Hayes 1996]

As a conclusion it's possible to assure that the two most important and complete approaches are:

- **The Hermann Brain Dominance Instrument (HDBI)**
- **Cognitive Style Index (CSI)**

Looking at the cognitive style from a personality perspective the most used test is:

- **Myers-Briggs type indicator (MBTI)**

For our project it could be interesting to develop the characteristic of the advisors following some ideas emerging from these two analysis.

As a reference scheme see Fig.1 - Hermann's Cognitive Brain Scheme.

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Introduction

Broadband Usage and Attitude

Thank you for agreeing to participate in our survey being conducted to help us better understand your broadband preferences. This survey will take approximately 20 minutes to complete.

Please read each question carefully before answering it. Even if you are not certain about the exact answer to a question, mark the answer that is closest to your opinion and go to the next question. Your responses will be kept in the strictest of confidence. Your participation in this survey is voluntary. Thank you for your time and effort!

When you are ready to get started, please click the "NEXT" button.

NEXT

Broadband Usage and Attitude

Our first few questions are for classification purposes and they enable us to select questions to ask you later in the survey.

Please enter your post code in the space below.
[ENTER POST CODE]

Prefer not to answer

NEXT

S2.

Broadband Usage and Attitude

Do you own broadband services (high-speed Internet) in your home?
[CHOOSE ONE ONLY]

Yes

No

NEXT

S3.

Broadband Usage and Attitude

Are you currently considering buying a broadband services for your home?
[CHOOSE ONE ONLY]

Yes

No

NEXT

S4.

Broadband Usage and Attitude

Are you currently using high speed Internet to access this survey?
[CHOOSE ONE ONLY]

Yes

No

NEXT

Q1.

Broadband Usage and Attitude

In this section, we would like you to answer questions related to broadband service ownership and preferences.

Which service provider do you use?
[CHOOSE ONE ONLY]

- AOL
- BlueYonder
- BT
- Bulldog
- Compuserve
- Demon
- EFH Broadband
- Euronet1
- Freeserve
- ntl
- PipeX
- TalkTalk
- Telewest
- Tiscali
- Virgin.net
- Wanadoo
- Other. Please specify:

NEXT

Q2.

Broadband Usage and Attitude

From the list of broadband suppliers below, which service providers would you consider as a possible service provider for your home?
[CHECK ALL THAT APPLY]

- AOL
- BlueYonder
- BT
- Bulldog
- Compuserve
- Demon
- EFH Broadband
- Euronet1
- Freeserve
- ntl
- Pipex
- TalkTalk
- Telewest
- Tiscali
- Virgin.net
- Wanadoo
- Other. Please specify:
- None of the above

NEXT

Q2a.

Broadband Usage and Attitude

You stated that you would consider AOL, BlueYonder, BT, Compuserve, EFH Broadband, Freeserve. Of these providers, which are the top three you consider as possible providers for your broadband internet service?
[CHECK 3 ONLY]

- AOL
- BlueYonder
- BT
- Compuserve
- EFH Broadband
- Freeserve

NEXT

Q3.

Broadband Usage and Attitude

Now we would like to understand your opinion of broadband providers that you have indicated you would consider. You will be presented with the list of broadband providers you have chosen and a statement that may or may not describe the companies.

Please read each statement and using the scale below as a guide, tell us if you agree or disagree with the statement as it pertains to the provider listed.

- 1-Strongly Disagree
- 2-Disagree
- 3-Neutral (Neither Disagree nor Agree)
- 4-Agree
- 5-Strongly Agree

[CHOOSE ONE ONLY FOR EACH ITEM LISTED BELOW]

BT	Strongly Disagree					Strongly Agree
	1	2	3	4	5	
Overall, I trust BT	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
BT offers service at a better price	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
BT offers better quality of service	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
BT offers more flexibility in plans	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
BT is open, honest, and transparent	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
BT works hard to meet my changing needs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
BT is willing to assist and support me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
I would not recommend BT to a friend	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

NEXT

Q4.

Broadband Usage and Attitude

Please rate the providers you have selected in order of preference. In order to do so, assume you have been given 100 chips. Please allocate the chips among the service providers you have chosen in terms of order of preference. Allocate more points to the providers that you are more likely to purchase and fewer points to the providers you are less likely to purchase. Please be sure to enter values that sum to 100.
[MUST SUM TO 100]

BT	<input type="text"/>
EuroNet1	<input type="text"/>
ntl	<input type="text"/>
TalkTalk	<input type="text"/>
Tiscali	<input type="text"/>
Total: <input type="text" value="0"/>	

NEXT

Q5.

Broadband Usage and Attitude

Now we would like to understand how likely you are to purchase a broadband service plan from each service provider in which you have indicated an interest.

For each service provider, what is the likelihood of you purchasing a broadband service plan?

100% Certain
90% Almost Sure
80% Very Probable
70% Probable
60% Good Chance
50% Fairly Good Chance
40% Fair Chance
30% Some Chance
20% Slight Chance
10% Very Slight Chance
0% No Chance at All

[CHOOSE ONE ONLY PER ROW]

BT	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%
Euronet1											
ntl											
TalkTalk											
Tiscali											

NEXT

Site Introduction

Broadband Usage and Attitude

Now we would like you to visit a site that has been designed to present a range of broadband suppliers and service plans in the most transparent way possible in order to help you make the best decision for you. Please act as if you are replacing your current broadband provider.

This site gives you help in buying a broadband service for your home. It includes information about plans, a virtual advisor, a community, and a learning center to help you make the best choice of possible provider. **The content on this site is for example only and not all features of the site are active. Figures for prices, ratings, speed, reliability etc. are hypothetical.**

Browse the site as you would if you were replacing your existing plan. **Information viewed on this site is important to the questions that follow it in the survey, so please spend time carefully examining the following pages.**

There are four main sections on the site:

- Broadband Advisor
- Learning Centre
- Compare Plans
- Broadband Community

Please explore each of these sections before you close the window. To qualify for completion, you should spend at least 5 minutes at the site and visit all four sections.

You will not actually be able to buy a plan here, but you will be able to get all the information you need to select the best plan for you if you were actually buying a plan now. Once you finish visiting the site you will be asked in the survey about your intention to buy broadband services.

Click [HERE](#) now to access the site.

When you finish visiting the site, please make sure to close that window and click "Next" button below to continue the survey.

NEXT

Q6.

Broadband Usage and Attitude

For each statement below, please indicate the number that best indicates your level of agreement.
[CHOOSE ONE ONLY FOR EACH STATEMENT]

	Strongly Disagree			Strongly Agree	
	1	2	3	4	5
The site is not easy to use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The site clearly explains how my personal information is used	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The site provides accurate and relevant information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The site does not provide me with sufficient information to make a purchase decision on all products being offered	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Products can easily be compared	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The site is helpful to me in reaching my buying decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I did not enjoy the overall experience of the site	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NEXT

Q7.

Broadband Usage and Attitude

For each statement below, please indicate the number that best indicates your level of agreement.
 [CHOOSE ONE ONLY FOR EACH STATEMENT]

	Strongly Disagree					Strongly Agree				
This site appears to be more trustworthy than other sites I have visited	1	2	3	4	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would recommend this site to a friend	1	2	3	4	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would not book mark this site	1	2	3	4	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Extremely Untrustworthy					Extremely Trustworthy				
My overall trust in this site is	1	2	3	4	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Extremely Unbelievable					Extremely Believable				
My overall believability of the information on this site is	1	2	3	4	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Not Confident at All					Extremely Confident				
My overall confidence in the recommendations on this site is	1	2	3	4	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NEXT

Q8.

Broadband Usage and Attitude

Having visited the information site, which service providers would you now consider from the list of broadband suppliers below, as a possible service provider for your home
[CHECK ALL THAT APPLY]

- AOL
- BlueYonder
- BT
- Bulldog
- Compuserve
- Demon
- EFH Broadband
- Euronet1
- Freeserve
- ntl
- Pipex
- TalkTalk
- Telewest
- Tiscali
- Virgin.net
- Wanadoo
- Other. Please specify:

NEXT

Q8a.

Broadband Usage and Attitude

You stated that you would consider AOL, Bulldog, Demon, Euronet1, ntl, TalkTalk, Virgin.net. Of these providers, which are the top three you consider as possible providers for your broadband internet service?

[CHOOSE 3 ONLY]

- AOL
- Bulldog
- Demon
- Euronet1
- ntl
- TalkTalk
- Virgin.net

NEXT

Q9.

Broadband Usage and Attitude

Now we would like to understand your opinion of broadband providers that you have indicated you would consider after visiting the site. You will be presented with the list of broadband providers you have chosen after visiting the site and a statement that may or may not describe the companies.

Please read each statement and using the scale below as a guide, tell us if you agree or disagree with the statement as it pertains to the providers listed.
[CHOOSE ONE ONLY FOR EACH STATEMENT]

AOL

	Strongly Disagree					Strongly Agree
	1	2	3	4	5	
Overall, I trust AOL	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
AOL offers service at a better price	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
AOL offers better quality of service	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
AOL offers more flexibility in plans	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
AOL is open, honest, and transparent	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
AOL works hard to meet my changing needs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
AOL is willing to assist and support me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
I would not recommend AOL to a friend	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

NEXT

Q10.

Broadband Usage and Attitude

Please rate the provider you have selected after visiting the site, in order of preference. In order to do so, assume you have been given 100 chips. Please allocate the chips among the service providers you have chosen in terms of order of preference. Allocate more points to the providers that you are more likely to purchase and fewer points to the providers you are less likely to purchase. Please be sure to enter values that sum to 100.
[MUST SUM TO 100]

AOL	<input type="text"/>
BT	<input type="text"/>
Compuserve	<input type="text"/>
Euro.net1	<input type="text"/>
Freearrow	<input type="text"/>
Total	<input type="text" value="0"/>

NEXT

Q11.

Broadband Usage and Attitude

We are interested in your chances of purchasing a broadband package, given the information provided in the web site you have just viewed.

What is the likelihood of your purchasing a broadband service plan from each service provider and about which you have indicated an interest?

100% Certain
90% Almost Sure
80% Very Probable
70% Probable
60% Good Chance
50% Fairly Good Chance
40% Fair Chance
30% Some Chance
20% Slight Chance
10% Very Slight Chance
0% No Chance at All

[CHOOSE ONE ONLY PER ROW]

AOL	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%
BT	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%
CompuServe	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%
EuroNet1	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%
FreeServe	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%

NEXT

Conjoint Introduction

Broadband Usage and Attitude

Below is the initial page that appears upon entering the site. On the next few screens you will see several pairs of snapshots of representative pages within the site. These pages differ in how the information is presented. Please look at these pages as though you were thinking of replacing your existing service.

You will see 8 such paired comparisons. Please indicate your preference between the 2 by allocating more chips to the image that appeals. Enter values that sum to 100.

Please click "Next" to continue.

Broadband Advice Centre

Compare Plans

Provider	Price	Speeds	Reliability	Type
BT	£ 15	256 kb	Great	DSL
Wanadoo	£ 15	512 kb	Average	Satellite
Damon	£ 17	256 kb	Great	DSL
NetServices	£ 22	256 kb	Great	Cable
AOL_G	£ 24	256 kb	Good	Cable
Elite_UK	£ 24	256 kb	Average	DSL
Atlas	£ 25	512 kb	Great	DSL
AOL_P	£ 29	512 kb	Good	Cable

[More >](#)

Choose a range of providers [Go ▶](#)

Broadband Advisor

Broadband Advisor

Get an assistant to help you with your broadband needs

[More >](#)

[Listen](#)

Get Advice on Broadband [Go ▶](#)

Broadband Community

Share and Consult views [Go ▶](#)

Learning Centre

Learn about Broadband [Go ▶](#)

Broadband Tools [Minimize >](#)

Advisor		As a leader of one of the largest consumer technology magazines in the world, I really have to be on top of whats going on in this space.
Video		Check out a great repository of expert testimony. Find out why certain providers stand out and which attributes are critical when choosing broadband access.
Bid your price		Inspired by the priceline model, tell us what you want and how much you are willing to pay. When providers compete, you win!
Build your plan		A grassroots approach to help build the perfect broadband plan for your needs from the grounds up. You tell us exactly what you want.
Information Centre		Feel like you need to educate yourself about the different broadband options and what the different features mean? The Information Centre is a great place to start.

[Terms and Conditions](#) | [Privacy policy](#)

NEXT

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Conjoint (See below)

Q12.

Broadband Usage and Attitude

For each statement below, please indicate the number that best indicates your level of agreement.
[CHOOSE ONE ONLY FOR EACH STATEMENT]

	Strongly Disagree			Strongly Agree	
	1	2	3	4	5
I like to take chances	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not like to experiment with new ways of doing things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am often among the last people to try a new product	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like to try new and different things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NEXT

Q13.

Broadband Usage and Attitude

For each statement below, please indicate the number that best indicates your level of agreement.
[CHOOSE ONE ONLY FOR EACH STATEMENT]

	Strongly Disagree			Strongly Agree	
	1	2	3	4	5
I use the internet for e-mail	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I use the internet for shopping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I use the internet for entertainment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have purchased products or services at other sites by completing the transaction online	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NEXT

Q14.

Broadband Usage and Attitude

Now we would like to learn a little bit more about you in order to understand your personal decision style when choosing between options. Please answer to what extent you agree or disagree with the statements below to best represents how you think or feel.

For each statement below, please indicate the number that best indicates your level of agreement using the 5-point scale below.
 [CHOOSE ONE ONLY FOR EACH STATEMENT]

	Strongly Disagree					Strongly Agree				
	1	2	3	4	5	1	2	3	4	5
I prefer to read text rather than to listen to a lecture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I enjoy deciphering graphs, charts, and diagrams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I will read an explanation of a graph/chart before I try to understand the graph/chart on my own	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I see what I read in mental pictures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am detail oriented, and start with the details in order to build a complete picture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tend to see problems in their entirety and start by integrating pieces from different areas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I find it is easy to make decisions for others and to command and direct others to take certain actions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In a group conversation, I usually speak the most	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have held a great deal of leadership positions in my life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My confidence level is higher than most other people's	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NEXT

Q15.

Broadband Usage and Attitude

Next to each of the three words below, write down the first word that comes to mind.
[ENTER A WORD FOR EACH]

Rain

Family

Technology

NEXT

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Q16.

Broadband Usage and Attitude

A bat and a ball cost \$1.10 in total. The bat costs a dollar more than the ball. How much does the ball cost?
[ENTER CENTS]

Cents

NEXT

Q17.

Broadband Usage and Attitude

For each of the words listed below, write down a word that means the opposite. (For example, the opposite of Rich is Poor).

[ENTER A WORD FOR EACH]

Broad

Hollow

Tiny

NEXT

Q18.

Broadband Usage and Attitude

If it takes 5 machines 5 minutes to produce 5 widgets, how long would it take 100 machines to produce 100 widgets?
[ENTER MINUTES]

Minutes

NEXT

Q19.

Broadband Usage and Attitude

The letters in the words below can be arranged to make exactly one other word (for example ARC = CAR).
Please rearrange each word to make the other new word.
[ENTER A WORD FOR EACH]

CONE

EAGER

LEFT

NEXT

Q20.

Broadband Usage and Attitude

In a lake, there is a patch of lily pads. Every day the patch doubles in size. If it takes 48 days for the patch to cover the lake, how long would it take for the patch to cover half of the lake?
[ENTER DAYS]

Days

NEXT

D1.

Broadband Usage and Attitude

What is your gender?
[CHOOSE ONE ONLY]

Male
 Female

NEXT

D2.

Broadband Usage and Attitude

What is your age?
[CHOOSE ONE ONLY]

- 16 - 25
- 26 - 29
- 30 - 35
- 36 - 40
- 41 - 49
- Over 50

NEXT

D3.

Broadband Usage and Attitude

What is your level of education?
[CHOOSE ONE ONLY]

- High school graduate
- Undergraduate degree
- Doctorate degree
- Professional certificate
- Master's degree
- Post-doctorate degree

NEXT

D4.

Broadband Usage and Attitude

What is your gross annual household income? Combine the total income for all household members living with you. Be sure to include wages or salaries, income from self employment, rent, dividends etc.

[CHOOSE ONE ONLY]

- < £20,000
- £20,000 - £40,000
- £40,000 - £60,000
- £60,000 - £80,000
- > £80,000
- Prefer not to answer

NEXT

Appendix F

Suruga Project Documents

This section include the documents that is involved to build the Suruga Morphing Web site:

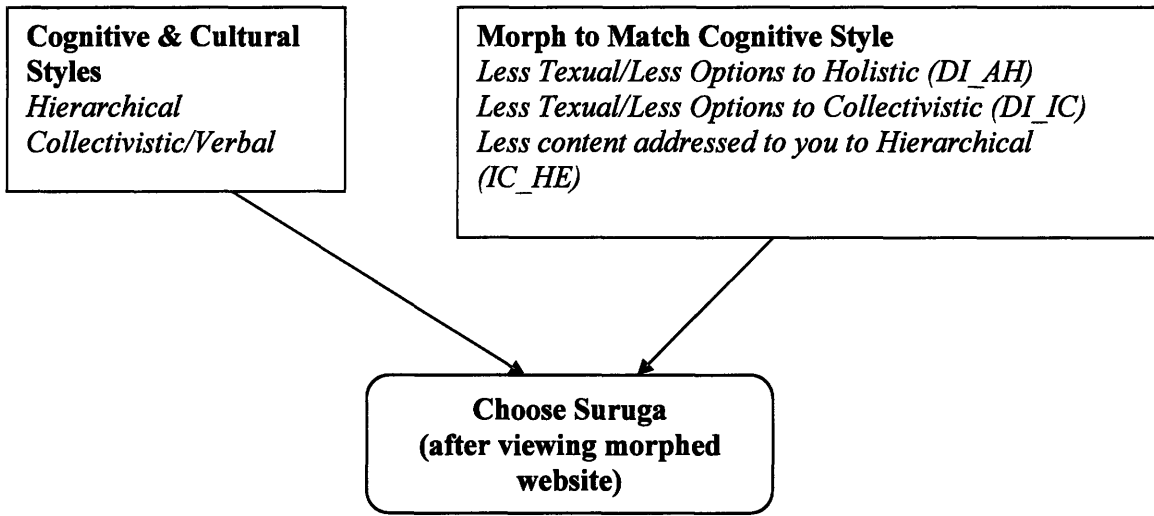
1. Suruga's Significant Factors - The results of this document is based on the analysis conducted in the following documents.
2. Suruga's Reliability Analysis - shows the Cronbach's Alphas for the current Suruga Factor. Some dimensions may need to be reconsidered because of the low reliability ratings.
3. Exploratory Factor Analysis (SPSS Output) - this gives an example of conducting Factor Analysis in SPSS. The scripts used to generate the charts are included with the document.
4. Exploratory Factor Analysis Reports 1-5 - a transcript of all the types of Factor Analysis I conducted in the first phase of the Suruga Study.
5. Suruga 16x16 ANOVA and Stepwise Regression - the transcript of ANOVA and Stepwise Regressions I've conducted to identify which factors are significant as well as obtaining the coefficients of these factors. This information is used to obtain the P_{rm} for the new Suruga Web site. 16x16 stands for the fact that the entire population is divided into 256 groups (16 morphs x 16 styles).

6. Acom 16x16 ANOVA and Stepwise Regression - Same as the file above, except the Analyss is for the competitor bank Acom.
7. Orix 16x16 ANOVA and Stepwise Regression - Same as the file above, except the Analyss is for the competitor bank Orix.
8. The Suruga Questionnaire compiled by Yoshio Tokoro. This is in both Japanese and English
9. The Suruga Questionnaire actually used in the field. This is in Japanese and the experiment itself is held in Tokyo.

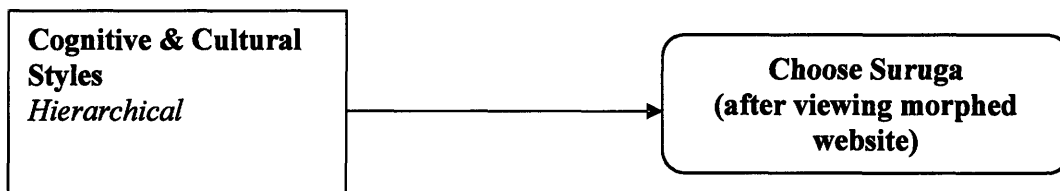
Clarence Lee
April 22, 2008

Significant Factors for Suruga Analysis

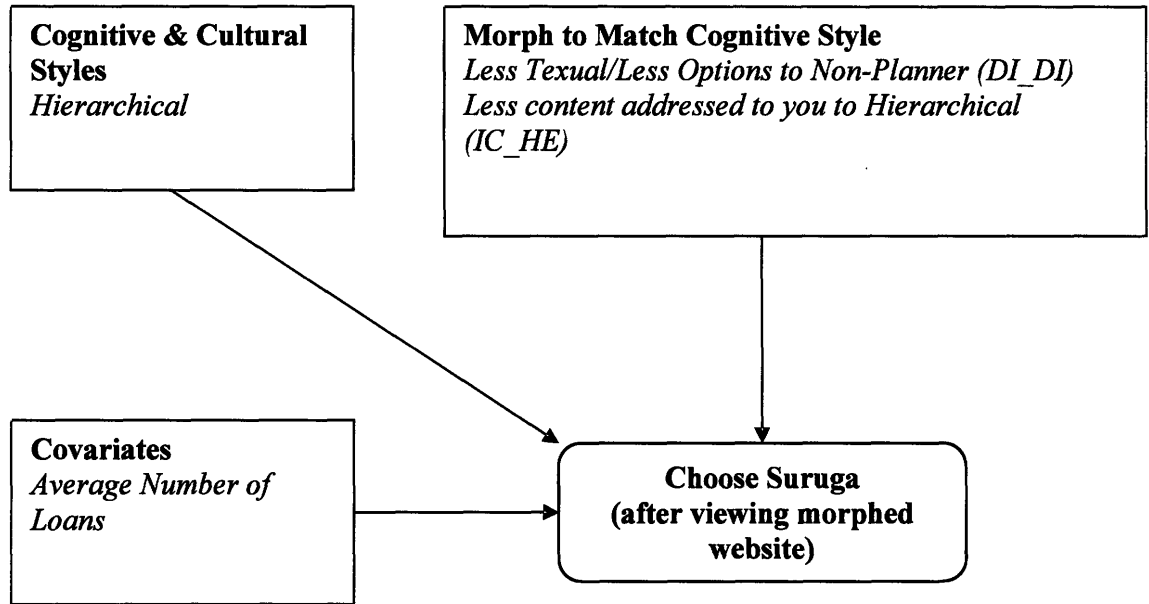
Analysis 1: 16x16 Grouping using Q6*Q9 for Suruga



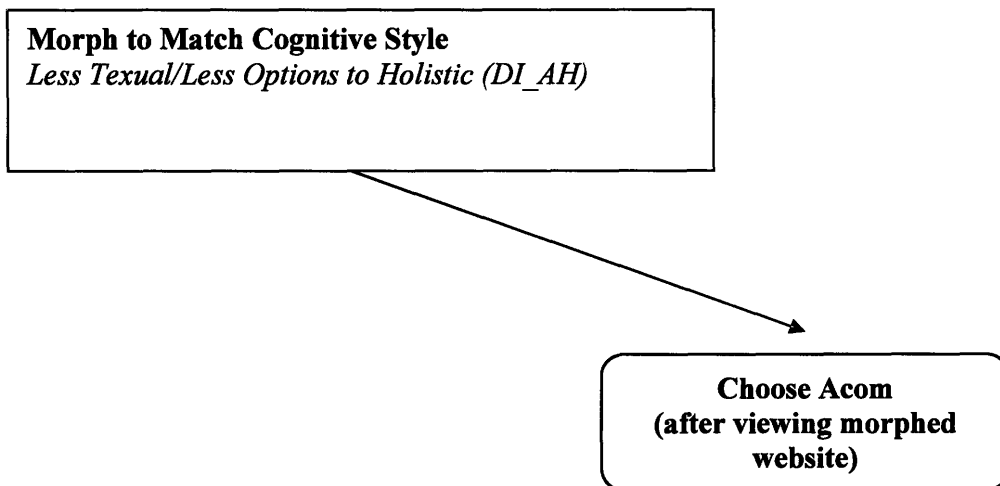
Analysis 2: 16x32 Grouping using Q6*Q9 for Suruga



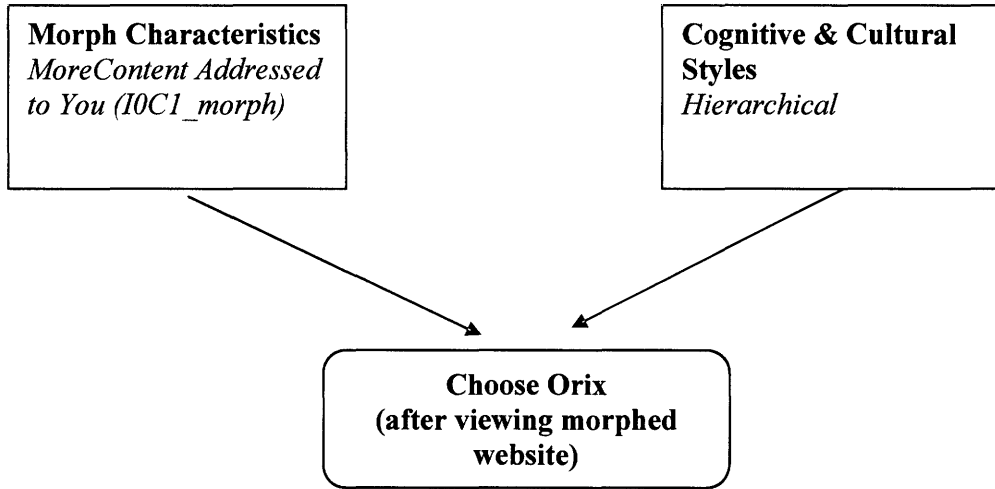
Analysis 3: 16x32 Grouping using Q6*Q9 for Suruga with Average Age and Average Number of Loans as covariates



Analysis 4: Acom 16x16 Grouping using Q6*Q9



Analysis 5: Orix 16x16 Grouping using Q6*Q9



```

RELIABILITY
/VARIABLES=q10_7 q10_10 q10_11
/SCALE('Analytic vs. Holistic') ALL
/MODEL=ALPHA
/STATISTICS=ANOVA
/SUMMARY=TOTAL.

```

Reliability

Notes

Output Created		2008-04-28T15:34:53.781
Comments		
Input	Data	C:\Documents and Settings\RA1\Desktop\Suruga Data\Suruga Completed Subjects Ascending 041408_1.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	501
	Matrix Input	C:\Documents and Settings\RA1\Desktop\Suruga Data\Suruga Completed Subjects Ascending 041408_1.sav
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the procedure.
Syntax		RELIABILITY /VARIABLES=q10_7 q10_10 q10_11 /SCALE('Analytic vs. Holistic') ALL /MODEL=ALPHA /STATISTICS=ANOVA /SUMMARY=TOTAL.
Resources	Processor Time	0:00:00.047
	Elapsed Time	0:00:00.125

Scale: Analytic vs. Holistic - High Reliability

Case Processing Summary

		N	%
Cases	Valid	501	100.0
	Excluded ^a	0	.0
	Total	501	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.693	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
q10_7 - Detailed oriented (AH)	6.04	2.218	.552	.546
q10_10 - Like detailed explanation (AH)	6.24	2.220	.420	.726
q10_11 - Interested in parts (AH)	6.13	2.286	.569	.532

ANOVA

		Sum of Squares	df	Mean Square	F	Sig
Between People		728.608	500	1.457		
Within People	Between Items	9.878	2	4.939	11.037	.000
	Residual	447.456	1000	.447		
	Total	457.333	1002	.456		
Total		1185.941	1502	.790		

Grand Mean = 3.07

```

RELIABILITY
/VARIABLES=q10_3 q10_4 q10_5
/SCALE('Individualistic/Visual vs. Collectivistic/Verbal') ALL
/MODEL=ALPHA
/STATISTICS=ANOVA
/SUMMARY=TOTAL.

```

Reliability

Notes

Output Created		2008-04-28T15:36:32.015
Comments		
Input	Data	C:\Documents and Settings\RA1\Desktop\Suruga Data\Suruga Completed Subjects Ascending 041408_1.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	501
	Matrix Input	Matrix Input
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the procedure.
Syntax		RELIABILITY /VARIABLES=q10_3 q10_4 q10_5 /SCALE('Individualistic/Visual vs. Collectivistic/Verbal') ALL /MODEL=ALPHA /STATISTICS=ANOVA /SUMMARY=TOTAL.
Resources	Processor Time	0:00:00.016
	Elapsed Time	0:00:00.047

Scale: Individualistic/Visual vs. Collectivistic/Verbal - Low Reliability

Case Processing Summary

		N	%
Cases	Valid	501	100.0
	Excluded ^a	0	.0
	Total	501	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.461	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
q10_3 - Time for Personal Life (IC)	4.96	1.912	.289	.356
q10_4 - I see what I read (AH)	4.87	1.793	.322	.297
q10_5 - Buy to differentiate (IC)	4.17	1.758	.246	.438

ANOVA

		Sum of Squares	df	Mean Square	F	Sig
Between People		538.000	500	1.076		
Within People	Between Items	186.076	2	93.038	160.431	.000
	Residual	579.924	1000	.580		
	Total	766.000	1002	.764		
Total		1304.000	1502	.868		

Grand Mean = 2.33

RELIABILITY

```
/VARIABLES=q10_2 q10_13_inv  
/SCALE('Planning vs. Non-planning') ALL  
/MODEL=ALPHA  
/STATISTICS=ANOVA  
/SUMMARY=TOTAL.
```

Reliability

Notes

Output Created		2008-04-28T15:38:25.062
Comments		
Input	Data	C:\Documents and Settings\RA1\Desktop\Suruga Data\Suruga Completed Subjects Ascending 041408_1.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	501
	Matrix Input	Matrix Input
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the procedure.
Syntax		RELIABILITY /VARIABLES=q10_2 q10_13_inv /SCALE('Planning vs. Non-planning') ALL /MODEL=ALPHA /STATISTICS=ANOVA /SUMMARY=TOTAL.
Resources	Processor Time	0:00:00.031
	Elapsed Time	0:00:00.031

[DataSet1] C:\Documents and Settings\RA1\Desktop\Suruga Data\Suruga Completed Subjects Ascending 041408_1.sav

Scale: Planning vs. Non-planning - Low Reliability

Case Processing Summary

		N	%
Cases	Valid	501	100.0
	Excluded ^a	0	.0
	Total	501	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.386	2

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
q10_2 - Prefer planning (DI)	2.4750	.958	.240	a
q10_13_inv - Purchases without consequences (DI)	2.3852	.837	.240	a

a. The value is negative due to a negative average covariance among items. This violates reliability model assumptions. You may want to check item codings.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig
Between People		556.110	500	1.112		
Within People	Between Items	2.021	1	2.021	2.959	.086
	Residual	341.479	500	.683		
	Total	343.500	501	.686		
Total		899.610	1001	.899		

Grand Mean = 2.4301

```
RELIABILITY
/VARIABLES=q10_1 q10_8
/SCALE('Hierarchical vs. Egalitarian') ALL
/MODEL=ALPHA
```

/STATISTICS=ANOVA
/SUMMARY=TOTAL.

Reliability

Notes

Output Created		2008-04-28T15:39:13.250
Comments		
Input	Data	C:\Documents and Settings\RA1\Desktop\Suruga Data\Suruga Completed Subjects Ascending 041408_1.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	501
	Matrix Input	Matrix Input
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the procedure.
Syntax		RELIABILITY /VARIABLES=q10_1 q10_8 /SCALE('Hierarchical vs. Egalitarian') ALL /MODEL=ALPHA /STATISTICS=ANOVA /SUMMARY=TOTAL.
Resources	Processor Time	0:00:00.047
	Elapsed Time	0:00:00.031

[DataSet1] C:\Documents and Settings\RA1\Desktop\Suruga Data\Suruga Completed Subjects Ascending 041408_1.sav

Scale: Hierarchical vs. Egalitarian - Low Reliability

		N	%
Cases	Valid	501	100.0
	Excluded ^a	0	.0
	Total	501	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.287	2

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
q10_1 - Afraid to Disagree(HE)	2.94	.851	.168	^a
q10_8 - Value expert's opinion (HE)	3.02	.954	.168	^a

a. The value is negative due to a negative average covariance among items. This violates reliability model assumptions. You may want to check item codings.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig
Between People		526.601	500	1.053		
Within People	Between Items	1.441	1	1.441	1.919	.167
	Residual	375.559	500	.751		
	Total	377.000	501	.752		
Total		903.601	1001	.903		

Grand Mean = 2.98

```

RECODE q10_6 (1=5) (2=4) (4=2) (5=1) (3=3) INTO q10_6_inv.
VARIABLE LABELS q10_6_inv 'q10_6_inv - Buy for my family (IC)'.
EXECUTE.
SAVE OUTFILE='C:\Documents and Settings\RA1\Desktop\Suruga Data Edited 032608.sav' /COMPRESSED.

```

```

>Warning # 5334. Command name: SAVE
>The SAVE command has succeeded. However, due to contention for the specified
>file, the data have been saved to a file with a different name.
>Saved to C:\Documents and Settings\RA1\Desktop\Suruga Data Edited 032608_1.sav.
RECODE q10_13 (CONVERT) ('1'=5) ('2'=4) ('3'=3) ('4'=2) ('5'=1) INTO q10_13_inv.
VARIABLE LABELS q10_13_inv 'q10_13 - Purchases without consequences (DI)'.
EXECUTE.
SAVE OUTFILE='C:\Documents and Settings\RA1\Desktop\Suruga Data Edited 032608_1.sav' /COMPRESSED.
FACTOR
/VARIABLES q10_1 q10_2 q10_3 q10_4 q10_5 q10_6_inv q10_13_inv q10_7 q10_8 q10_9 q10_10 q10_11 q10_12 q10_14 q11
q12 q13
/MISSING LISTWISE
/ANALYSIS q10_1 q10_2 q10_3 q10_4 q10_5 q10_6_inv q10_13_inv q10_7 q10_8 q10_9 q10_10 q10_11 q10_12 q10_14 q11
q12 q13
/PRINT INITIAL ROTATION
/PLOT EIGEN
/CRITERIA MINEIGEN(1) ITERATE(25)
/EXTRACTION PC
/CRITERIA ITERATE(25)
/ROTATION VARIMAX
/METHOD=CORRELATION.

```

Notes

Output Created	2008-03-26T12:17:16.515	
Comments		
Input	Data	C:\Documents and Settings\RA1\Desktop\Suruga Data Edited 032608_1.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	5454
Missing Value Handling	Definition of Missing	MISSING=EXCLUDE: User-defined missing values are treated as missing.
	Cases Used	LISTWISE: Statistics are based on cases with no missing values for any variable used.

Syntax	<pre> FACTOR /VARIABLES q10_1 q10_2 q10_3 q10_4 q10_5 q10_6_inv q10_13_inv q10_7 q10_8 q10_9 q10_10 q10_11 q10_12 q10_14 q11 q12 q13 /MISSING LISTWISE /ANALYSIS q10_1 q10_2 q10_3 q10_4 q10_5 q10_6_inv q10_13_inv q10_7 q10_8 q10_9 q10_10 q10_11 q10_12 q10_14 q11 q12 q13 /PRINT INITIAL ROTATION /PLOT EIGEN /CRITERIA MINEIGEN(1) ITERATE(25) /EXTRACTION PC /CRITERIA ITERATE(25) /ROTATION VARIMAX /METHOD=CORRELATION. </pre>	
Resources	Processor Time	0:00:00.640
	Elapsed Time	0:00:00.625
	Maximum Memory Required	35684 (34.848K) bytes

```

FACTOR
/VARIABLES q10_1 q10_2 q10_3 q10_4 q10_5 q10_6_inv q10_7 q10_8 q10_9 q10_10 q10_11 q10_12 q10_13_inv q10_14 q11
q12 q13
/MISSING LISTWISE
/ANALYSIS q10_1 q10_2 q10_3 q10_4 q10_5 q10_6_inv q10_7 q10_8 q10_9 q10_10 q10_11 q10_12 q10_13_inv q10_14 q11
q12 q13
/PRINT INITIAL ROTATION
/CRITERIA MINEIGEN(1) ITERATE(25)
/EXTRACTION PC
/CRITERIA ITERATE(25)
/ROTATION VARIMAX
/METHOD=CORRELATION.

```

Factor Analysis

Notes

Output Created	2008-03-26T12:23:28.984	
Comments		
Input	Data	C:\Documents and Settings\RA1\Desktop\Suruga Data Edited 032608_1.sav
	Active Dataset	DataSet1
	Filter	<none>

	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	5454
Missing Value Handling	Definition of Missing	MISSING=EXCLUDE: User-defined missing values are treated as missing.
	Cases Used	LISTWISE: Statistics are based on cases with no missing values for any variable used.
Syntax		<pre> FACTOR /VARIABLES q10_1 q10_2 q10_3 q10_4 q10_5 q10_6_inv q10_7 q10_8 q10_9 q10_10 q10_11 q10_12 q10_13_inv q10_14 q11 q12 q13 /MISSING LISTWISE /ANALYSIS q10_1 q10_2 q10_3 q10_4 q10_5 q10_6_inv q10_7 q10_8 q10_9 q10_10 q10_11 q10_12 q10_13_inv q10_14 q11 q12 q13 /PRINT INITIAL ROTATION /CRITERIA MINEIGEN(1) ITERATE(25) /EXTRACTION PC /CRITERIA ITERATE(25) /ROTATION VARIMAX /METHOD=CORRELATION. </pre>
Resources	Processor Time	0:00:00.078
	Elapsed Time	0:00:00.110
	Maximum Memory Required	35684 (34.848K) bytes

[DataSet1] C:\Documents and Settings\RA1\Desktop\Suruga Data Edited 032608_1.sav

Communalities

	Initial
q10_1 - Afraid to Disagree(HE)	1.000
q10_2 - Prefer planning (DI)	1.000
q10_3 - Time for Personal Life (IC)	1.000
q10_4 - I see what I read (AH)	1.000
q10_5 - Buy to differentiate (IC)	1.000
q10_6_inv - Buy for my family (IC)	1.000

q10_7 - Detailed oriented (AH)	1.000
q10_8 - Value expert's opinion (HE)	1.000
q10_9 - Enjoy deciphering graphs (AH)	1.000
q10_10 - Like detailed explanation (AH)	1.000
q10_11 - Interested in parts (AH)	1.000
q10_12 - Authority and leadership (HE)	1.000
q10_13 - Purchases without consequences (DI)	1.000
q10_14 - Read an explanation of a graphic (AH)	1.000
q11 - Bat and Ball (DI)	1.000
q12 - Machine Indicator (DI)	1.000
q13 - Lily Indicator (DI)	1.000

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.169	18.639	18.639	2.147	12.628	12.628
2	1.580	9.295	27.934	1.823	10.725	23.353
3	1.396	8.211	36.145	1.460	8.586	31.938
4	1.172	6.892	43.037	1.417	8.335	40.273
5	1.045	6.144	49.181	1.414	8.316	48.589
6	1.006	5.917	55.098	1.106	6.509	55.098
7	.972	5.716	60.814			
8	.870	5.118	65.932			
9	.832	4.894	70.826			
10	.778	4.579	75.405			
11	.721	4.242	79.647			
12	.694	4.081	83.728			
13	.683	4.016	87.745			
14	.604	3.553	91.297			
15	.582	3.426	94.724			

16	.489	2.879	97.603		
17	.408	2.397	100.000		

Extraction Method: Principal Component Analysis.

Rotated Component Matrix^a

	Component					
	1	2	3	4	5	6
q10_1 - Afraid to Disagree(HE)	.081	.115	-.041	-.002	.754	-.142
q10_2 - Prefer planning (DI)	.367	.417	.309	-.329	-.001	-.169
q10_3 - Time for Personal Life (IC)	.097	.649	-.061	.011	.059	-.113
q10_4 - I see what I read (AH)	-.040	.716	.033	.149	.038	-.042
q10_5 - Buy to differentiate (IC)	.155	.333	-.059	.695	-.125	-.065
q10_6_inv - Buy for my family (IC)	-.039	-.461	-.198	-.065	-.368	-.396
q10_7 - Detailed oriented (AH)	.795	-.035	.010	.101	.208	.088
q10_8 - Value expert's opinion (HE)	.171	.193	.577	.077	.142	-.158
q10_9 - Enjoy deciphering graphs (AH)	.287	.411	.464	-.039	-.019	.006
q10_10 - Like detailed explanation (AH)	.648	.236	.203	.079	-.086	-.031
q10_11 - Interested in parts (AH)	.812	.003	-.058	.049	.171	.021
q10_12 - Authority and leadership (HE)	.200	.065	.453	.572	-.007	.007
q10_13 - Purchases without consequences (DI)	-.057	-.190	-.132	.617	.485	-.039
q10_14 - Read an explanation of a graphic (AH)	.265	.046	.258	-.014	.552	.078
q11 - Bat and Ball (DI)	.168	.223	-.649	.066	-.013	-.002
q12 - Machine Indicator (DI)	-.021	.002	-.093	-.222	-.213	.647
q13 - Lily Indicator (DI)	.065	-.154	-.055	.106	.063	.649

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 10 iterations.

Component Transformation Matrix

Component	1	2	3	4	5	6
1	.671	.511	.374	.219	.310	-.067
2	.172	-.522	-.324	.554	.517	.140
3	.602	-.387	-.041	-.546	-.143	.409
4	.180	.455	-.730	.208	-.350	.249
5	.270	-.327	.208	.450	-.684	-.326
6	-.228	.057	.421	.319	-.161	.800

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

```

FACTOR
/VARIABLES q10_1 q10_2 q10_3 q10_4 q10_5 q10_6_inv q10_7 q10_8 q10_9 q10_10 q10_11 q10_12 q10_13_inv q10_14
/MISSING LISTWISE
/ANALYSIS q10_1 q10_2 q10_3 q10_4 q10_5 q10_6_inv q10_7 q10_8 q10_9 q10_10 q10_11 q10_12 q10_13_inv q10_14
/PRINT INITIAL ROTATION
/CRITERIA MINEIGEN(1) ITERATE(25)
/EXTRACTION PC
/CRITERIA ITERATE(25)
/ROTATION VARIMAX
/METHOD=CORRELATION.
    
```

Factor Analysis – Without Shane’s Questions

Notes

Output Created	2008-03-26T12:29:14.593
Comments	
Input	Data
	C:\Documents and Settings\RA1\Desktop\Suruga Data Edited 032608_1.sav
	Active Dataset
	DataSet1
	Filter
	<none>
	Weight
	<none>
	Split File
	<none>
	N of Rows in Working Data File
	5454
Missing Value Handling	Definition of Missing
	MISSING=EXCLUDE: User-defined missing values are treated as missing.
	Cases Used
	LISTWISE: Statistics are based on cases with no missing values for any variable used.

Syntax	<pre> FACTOR /VARIABLES q10_1 q10_2 q10_3 q10_4 q10_5 q10_6_inv q10_7 q10_8 q10_9 q10_10 q10_11 q10_12 q10_13_inv q10_14 /MISSING LISTWISE /ANALYSIS q10_1 q10_2 q10_3 q10_4 q10_5 q10_6_inv q10_7 q10_8 q10_9 q10_10 q10_11 q10_12 q10_13_inv q10_14 /PRINT INITIAL ROTATION /CRITERIA MINEIGEN(1) ITERATE(25) /EXTRACTION PC /CRITERIA ITERATE(25) /ROTATION VARIMAX /METHOD=CORRELATION. </pre>	
Resources	Processor Time	0:00:00.203
	Elapsed Time	0:00:00.218
	Maximum Memory Required	24872 (24.289K) bytes

[DataSet1] C:\Documents and Settings\RA1\Desktop\Suruga Data Edited 032608_1.sav

Communalities

	Initial
q10_1 - Afraid to Disagree(HE)	1.000
q10_2 - Prefer planning (DI)	1.000
q10_3 - Time for Personal Life (IC)	1.000
q10_4 - I see what I read (AH)	1.000
q10_5 - Buy to differentiate (IC)	1.000
q10_6_inv - Buy for my family (IC)	1.000
q10_7 - Detailed oriented (AH)	1.000
q10_8 - Value expert's opinion (HE)	1.000
q10_9 - Enjoy deciphering graphs (AH)	1.000
q10_10 - Like detailed explanation (AH)	1.000

q10_11 - Interested in parts (AH)	1.000
q10_12 - Authority and leadership (HE)	1.000
q10_13 - Purchases without consequences (DI)	1.000
q10_14 - Read an explanation of a graphic (AH)	1.000

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.127	22.335	22.335	1.923	13.737	13.737
2	1.528	10.911	33.246	1.800	12.857	26.594
3	1.321	9.432	42.679	1.542	11.014	37.608
4	1.080	7.717	50.395	1.430	10.217	47.826
5	1.029	7.349	57.744	1.389	9.918	57.744
6	.857	6.123	63.867			
7	.841	6.004	69.871			
8	.726	5.189	75.060			
9	.698	4.982	80.042			
10	.688	4.912	84.954			
11	.606	4.328	89.282			
12	.584	4.171	93.453			
13	.509	3.634	97.087			
14	.408	2.913	100.000			

Extraction Method: Principal Component Analysis.

Rotated Component Matrix^a

	Component				
	1	2	3	4	5
q10_1 - Afraid to Disagree(HE)	.046	-.007	.110	.751	.024
q10_2 - Prefer planning (DI)	.241	.548	.303	.039	-.293

q10_3 - Time for Personal Life (IC)	.112	.044	.732	.048	-.016
q10_4 - I see what I read (AH)	-.048	.137	.734	.056	.131
q10_5 - Buy to differentiate (IC)	.130	.041	.343	-.112	.712
q10_6_inv - Buy for my family (IC)	-.082	-.173	-.373	-.412	-.039
q10_7 - Detailed oriented (AH)	.821	.065	-.012	.193	.089
q10_8 - Value expert's opinion (HE)	-.021	.730	-.044	.228	.169
q10_9 - Enjoy deciphering graphs (AH)	.171	.639	.226	.032	.017
q10_10 - Like detailed explanation (AH)	.591	.372	.179	-.073	.098
q10_11 - Interested in parts (AH)	.842	.032	.037	.144	.039
q10_12 - Authority and leadership (HE)	.118	.442	-.050	.049	.599
q10_13 - Purchases without consequences (DI)	.026	-.317	-.122	.458	.608
q10_14 - Read an explanation of a graphic (AH)	.217	.260	-.037	.590	-.009

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 13 iterations.

Component Transformation Matrix

Component	1	2	3	4	5
1	.596	.560	.398	.344	.235
2	.246	-.468	-.446	.487	.534
3	-.621	-.037	.525	.143	.563
4	.388	-.263	.184	-.750	.429
5	-.221	.630	-.577	-.249	.399

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Clarence Lee
 March 26, 2008
 Suruga Morphing Project

Exploratory Factor Analysis 1

These analyses are done by inverting questions q10_6 and q10_13.

Trial 1: Extraction with "Eigenvalue over 1" option.
 This yields a total of 6 factors.

Rotated Component Matrix^a

	Component					
	1	2	3	4	5	6
q10_1 - Afraid to Disagree(HE)	.081	.115	-.041	-.002	.754	-.142
q10_2 - Prefer planning (DI)	.367	.417	.309	-.329	-.001	-.169
q10_3 - Time for Personal Life (IC)	.097	.649	-.061	.011	.059	-.113
q10_4 - I see what I read (AH)	-.040	.716	.033	.149	.038	-.042
q10_5 - Buy to differentiate (IC)	.155	.333	-.059	.695	-.125	-.065
q10_6_inv - Buy for my family (IC)	-.039	-.461	-.198	-.065	-.368	-.396
q10_13 - Purchases without consequences (DI)	-.057	-.190	-.132	.617	.485	-.039
q10_7 - Detailed oriented (AH)	.795	-.035	.010	.101	.208	.088
q10_8 - Value expert's opinion (HE)	.171	.193	.577	.077	.142	-.158
q10_9 - Enjoy deciphering graphs (AH)	.287	.411	.464	-.039	-.019	.006
q10_10 - Like detailed explanation (AH)	.648	.236	.203	.079	-.086	-.031
q10_11 - Interested in parts (AH)	.812	.003	-.058	.049	.171	.021
q10_12 - Authority and leadership (HE)	.200	.065	.453	.572	-.007	.007
q10_14 - Read an explanation of a graphic (AH)	.265	.046	.258	-.014	.552	.078
q11 - Bat and Ball (DI)	.168	.223	-.649	.066	-.013	-.002
q12 - Machine Indicator (DI)	-.021	.002	-.093	-.222	-.213	.647
q13 - Lily Indicator (DI)	.065	-.154	-.055	.106	.063	.649

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 10 iterations.

Trial 2: Extraction with 4 factors.

Rotated Component Matrix^a

	Component			
	1	2	3	4
q10_1 - Afraid to Disagree(HE)	.022	.166	.516	.021
q10_2 - Prefer planning (DI)	.677	.175	-.069	.123
q10_3 - Time for Personal Life (IC)	.299	.003	.001	.557
q10_4 - I see what I read (AH)	.296	-.114	.076	.629
q10_5 - Buy to differentiate (IC)	-.097	.083	.290	.635
q10_6 - Buy for my family (IC)	.242	.182	.204	.264
q10_7 - Detailed oriented (AH)	.132	.788	.177	.043
q10_8 - Value expert's opinion (HE)	.539	.027	.377	-.002
q10_9 - Enjoy deciphering graphs (AH)	.617	.150	.096	.182
q10_10 - Like detailed explanation (AH)	.409	.502	.050	.221
q10_11 - Interested in parts (AH)	.141	.776	.113	.084
q10_12 - Authority and leadership (HE)	.183	.125	.484	.172
q10_13 - Purchases without consequences (DI)	-.467	.084	.661	.102
q10_14 - Read an explanation of a graphic (AH)	.229	.335	.426	-.115
q11 - Bat and Ball (DI)	-.341	.216	-.224	.446
q12 - Machine Indicator (DI)	-.093	.181	-.489	-.080
q13 - Lily Indicator (DI)	-.265	.333	-.087	-.102

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 9 iterations.

Trial 3: Extraction with 5 factors.

Rotated Component Matrix^a

	Component				
	1	2	3	4	5
q10_1 - Afraid to Disagree(HE)	.019	.094	.005	.122	.718
q10_2 - Prefer planning (DI)	.327	.391	.439	-.241	.039
q10_3 - Time for Personal Life (IC)	.066	.654	.026	.029	.071
q10_4 - I see what I read (AH)	-.033	.714	.057	.131	.068
q10_5 - Buy to differentiate (IC)	.194	.368	-.144	.634	-.151
q10_6 - Buy for my family (IC)	.123	.411	.024	-.057	.467
q10_7 - Detailed oriented (AH)	.791	-.035	-.047	.080	.213
q10_8 - Value expert's opinion (HE)	.189	.150	.570	.167	.174
q10_9 - Enjoy deciphering graphs (AH)	.321	.374	.448	-.032	.050
q10_10 - Like detailed explanation (AH)	.653	.234	.200	.075	-.060
q10_11 - Interested in parts (AH)	.786	.012	-.068	.048	.165
q10_12 - Authority and leadership (HE)	.283	.049	.290	.543	.013
q10_13 - Purchases without consequences (DI)	-.044	-.178	-.256	.632	.417
q10_14 - Read an explanation of a graphic (AH)	.274	.000	.191	.026	.580
q11 - Bat and Ball (DI)	.109	.280	-.577	.016	-.062
q12 - Machine Indicator (DI)	.084	-.018	-.286	-.472	-.101
q13 - Lily Indicator (DI)	.188	-.177	-.338	-.135	.149

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 21 iterations.

Trial 4: Extraction with 7 factors..

Rotated Component Matrix^a

	Component						
	1	2	3	4	5	6	7
q10_1 - Afraid to Disagree(HE)	.072	.060	.080	.759	-.029	-.107	.124
q10_2 - Prefer planning (DI)	.311	.506	.337	.002	-.267	-.038	-.052
q10_3 - Time for Personal Life (IC)	.116	.038	.733	.038	-.019	-.096	.023
q10_4 - I see what I read (AH)	-.040	.125	.736	.042	.150	.018	.025
q10_5 - Buy to differentiate (IC)	.124	.037	.289	-.093	.701	-.040	.208
q10_6 - Buy for my family (IC)	.036	.190	.345	.397	.124	.480	-.061
q10_7 - Detailed oriented (AH)	.810	.027	-.017	.187	.095	.022	-.004
q10_8 - Value expert's opinion (HE)	.066	.690	-.023	.199	.195	.020	-.093
q10_9 - Enjoy deciphering graphs (AH)	.214	.587	.250	.016	.068	.161	-.098
q10_10 - Like detailed explanation (AH)	.614	.315	.184	-.083	.125	.009	-.014
q10_11 - Interested in parts (AH)	.816	.037	.013	.150	.038	-.023	.084
q10_12 - Authority and leadership (HE)	.169	.308	.000	.029	.637	.011	-.226
q10_13 - Purchases without consequences (DI)	-.032	-.255	-.157	.498	.563	-.132	.078
q10_14 - Read an explanation of a graphic (AH)	.274	.171	.023	.552	.004	.069	-.188
q11 - Bat and Ball (DI)	.100	-.130	.051	.019	.046	.148	.810
q12 - Machine Indicator (DI)	-.049	.015	-.212	-.175	-.139	.766	.199
q13 - Lily Indicator (DI)	.216	-.535	.058	.011	.055	.397	-.433

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 10 iterations.

Trial 5: Extraction with “Eigenvalue over 1” option. This trial is done by excluding Shane’s questions.

Yields 5 factors.

Rotated Component Matrix^a

	Component				
	1	2	3	4	5
q10_1 - Afraid to Disagree(HE)	.046	-.007	.110	.751	.024
q10_2 - Prefer planning (DI)	.241	.548	.303	.039	-.293
q10_3 - Time for Personal Life (IC)	.112	.044	.732	.048	-.016
q10_4 - I see what I read (AH)	-.048	.137	.734	.056	.131
q10_5 - Buy to differentiate (IC)	.130	.041	.343	-.112	.712
q10_6 - Buy for my family (IC)	.082	.173	.373	.412	.039
q10_7 - Detailed oriented (AH)	.821	.065	-.012	.193	.089
q10_8 - Value expert's opinion (HE)	-.021	.730	-.044	.228	.169
q10_9 - Enjoy deciphering graphs (AH)	.171	.639	.226	.032	.017
q10_10 - Like detailed explanation (AH)	.591	.372	.179	-.073	.098
q10_11 - Interested in parts (AH)	.842	.032	.037	.144	.039
q10_12 - Authority and leadership (HE)	.118	.442	-.050	.049	.599
q10_13 - Purchases without consequences (DI)	.026	-.317	-.122	.458	.608
q10_14 - Read an explanation of a graphic (AH)	.217	.260	-.037	.590	-.009

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 13 iterations.

Exploratory Factor Analysis 2

These analyses are done by inverting questions q10_6 and q10_13.

Trial 1: Extraction with “Eigenvalue over 1” option.
 This yields a total of 6 factors.

Rotated Component Matrix^a

	Component					
	1	2	3	4	5	6
q10_1 - Afraid to Disagree(HE)	.081	.115	-.041	-.002	.754	-.142
q10_2 - Prefer planning (DI)	.367	.417	.309	-.329	-.001	-.169
q10_3 - Time for Personal Life (IC)	.097	.649	-.061	.011	.059	-.113
q10_4 - I see what I read (AH)	-.040	.716	.033	.149	.038	-.042
q10_5 - Buy to differentiate (IC)	.155	.333	-.059	.695	-.125	-.065
q10_6_inv - Buy for my family (IC)	-.039	-.461	-.198	-.065	-.368	-.396
q10_7 - Detailed oriented (AH)	.795	-.035	.010	.101	.208	.088
q10_8 - Value expert's opinion (HE)	.171	.193	.577	.077	.142	-.158
q10_9 - Enjoy deciphering graphs (AH)	.287	.411	.464	-.039	-.019	.006
q10_10 - Like detailed explanation (AH)	.648	.236	.203	.079	-.086	-.031
q10_11 - Interested in parts (AH)	.812	.003	-.058	.049	.171	.021
q10_12 - Authority and leadership (HE)	.200	.065	.453	.572	-.007	.007
q10_13 - Purchases without consequences (DI)	-.057	-.190	-.132	.617	.485	-.039
q10_14 - Read an explanation of a graphic (AH)	.265	.046	.258	-.014	.552	.078
q11 - Bat and Ball (DI)	.168	.223	-.649	.066	-.013	-.002
q12 - Machine Indicator (DI)	-.021	.002	-.093	-.222	-.213	.647
q13 - Lily Indicator (DI)	.065	-.154	-.055	.106	.063	.649

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 10 iterations.

Trial 2: Extraction with “Eigenvalue over 1” option. This trial is done by excluding Shane’s questions.
 Yields 5 factors.

Rotated Component Matrix^a

	Component				
	1	2	3	4	5
q10_1 - Afraid to Disagree(HE)	.046	-.007	.110	.751	.024
q10_2 - Prefer planning (DI)	.241	.548	.303	.039	-.293
q10_3 - Time for Personal Life (IC)	.112	.044	.732	.048	-.016
q10_4 - I see what I read (AH)	-.048	.137	.734	.056	.131
q10_5 - Buy to differentiate (IC)	.130	.041	.343	-.112	.712
q10_6_inv - Buy for my family (IC)	-.082	-.173	-.373	-.412	-.039
q10_7 - Detailed oriented (AH)	.821	.065	-.012	.193	.089
q10_8 - Value expert's opinion (HE)	-.021	.730	-.044	.228	.169
q10_9 - Enjoy deciphering graphs (AH)	.171	.639	.226	.032	.017
q10_10 - Like detailed explanation (AH)	.591	.372	.179	-.073	.098
q10_11 - Interested in parts (AH)	.842	.032	.037	.144	.039
q10_12 - Authority and leadership (HE)	.118	.442	-.050	.049	.599
q10_13 - Purchases without consequences (DI)	.026	-.317	-.122	.458	.608
q10_14 - Read an explanation of a graphic (AH)	.217	.260	-.037	.590	-.009

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 13 iterations.

Exploratory Factor Analysis 3

These analyses are done by inverting questions q10_6 and q10_13. In addition, q11_b, q12_b, and q13_b are all binary versions of q11, q12, and q13, with 1 denoting impulsive and 0 denoting deliberative. This is done with the following rules:

If q11 = 10, then q11_b = 1, else q11_b=0
If q11 = 100, then q11_b = 1, else q11_b=0
If q11 = 24, then q11_b = 1, else q11_b=0

Trial 1: Extraction with “Eigenvalue over 1” option.
 This yields a total of 6 factors.

Rotated Component Matrix^a

	Component					
	1	2	3	4	5	6
q10_1 - Afraid to Disagree(HE)	.008	.067	.063	.741	.032	-.108
q10_2 - Prefer planning (DI)	.230	.615	.266	.024	-.191	.029
q10_3 - Time for Personal Life (IC)	.080	.104	.707	.030	.019	-.053
q10_4 - I see what I read (AH)	-.047	.138	.744	.032	.141	-.064
q10_5 - Buy to differentiate (IC)	.119	-.033	.319	-.096	.729	-.011
q10_6_inv - Buy for my family (IC)	-.147	-.072	-.428	-.441	-.003	-.179
q10_7 - Detailed oriented (AH)	.816	.062	-.008	.182	.096	-.073
q10_8 - Value expert's opinion (HE)	-.009	.695	-.057	.231	.253	-.040
q10_9 - Enjoy deciphering graphs (AH)	.185	.599	.234	.067	.088	.133
q10_10 - Like detailed explanation (AH)	.579	.361	.172	-.060	.161	.072
q10_11 - Interested in parts (AH)	.808	.069	.027	.137	.056	-.090
q10_12 - Authority and leadership (HE)	.144	.310	-.035	.078	.637	-.012
q10_13_inv - Purchases without consequences (DI)	.028	-.418	-.091	.492	.526	.014
q10_14 - Read an explanation of a graphic (AH)	.273	.199	.005	.564	-.025	-.044
q11_b - Bat and Ball (DI)	-.096	.134	-.099	.062	.117	.597
q12_b - Machine Indicator (DI)	.195	-.219	.035	-.126	-.166	.669
q13_b - Lily Indicator (DI)	-.127	.088	.012	-.055	-.018	.632

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 10 iterations.

Trial 2: Extraction with “Eigenvalue over 1” option with removal of extraneous questions.
 This yields a total of 4 factors.

Rotated Component Matrix^a

	Component			
	1	2	3	4
q10_1 - Afraid to Disagree(HE)	.093	-.060	-.135	.802
q10_3 - Time for Personal Life (IC)	.059	.422	.058	.215
q10_5 - Buy to differentiate (IC)	.072	.707	-.042	-.060
q10_6_inv - Buy for my family (IC)	-.207	-.181	-.182	-.480
q10_7 - Detailed oriented (AH)	.825	.082	-.098	.107
q10_8 - Value expert's opinion (HE)	.069	.468	.009	.400
q10_10 - Like detailed explanation (AH)	.618	.327	.122	.038
q10_11 - Interested in parts (AH)	.825	.038	-.099	.150
q10_12 - Authority and leadership (HE)	.147	.673	-.067	-.022
q11_b - Bat and Ball (DI)	-.103	.068	.593	.219
q12_b - Machine Indicator (DI)	.184	-.165	.625	-.309
q13_b - Lily Indicator (DI)	-.085	-.002	.673	-.017

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Exploratory Factor Analysis 5

These analyses are done by inverting questions q10_6 and q10_13. In addition, q11_b, q12_b, and q13_b are all binary versions of q11, q12, and q13, with 1 denoting impulsive and 0 denoting deliberative. This is done with the following rules:

If q11 = 10, then q11_b = 1, else q11_b=0
If q11 = 100, then q11_b = 1, else q11_b=0
If q11 = 24, then q11_b = 1, else q11_b=0

I've also discovered a coding error for q10_13 in version 3. The error is that q10_13_inv is NOT the inverse of q10_13, it is the same. Hence, in Analysis 3, q10_13_inv yielded the same factor score as q10_13

Trial 1: Extraction with "Eigenvalue over 1" option.

This yields a total of 6 factors.

Rotated Component Matrix^a

	Component					
	1	2	3	4	5	6
q10_1 - Afraid to Disagree(HE)	.008	.067	.063	.741	.032	-.108
q10_2 - Prefer planning (DI)	.230	.615	.266	.024	-.191	.029
q10_3 - Time for Personal Life (IC)	.080	.104	.707	.030	.019	-.053
q10_4 - I see what I read (AH)	-.047	.138	.744	.032	.141	-.064
q10_5 - Buy to differentiate (IC)	.119	-.033	.319	-.096	.729	-.011
q10_6_inv - Buy for my family (IC)	-.147	-.072	-.428	-.441	-.003	-.179
q10_7 - Detailed oriented (AH)	.816	.062	-.008	.182	.096	-.073
q10_8 - Value expert's opinion (HE)	-.009	.695	-.057	.231	.253	-.040
q10_9 - Enjoy deciphering graphs (AH)	.185	.599	.234	.067	.088	.133
q10_10 - Like detailed explanation (AH)	.579	.361	.172	-.060	.161	.072
q10_11 - Interested in parts (AH)	.808	.069	.027	.137	.056	-.090
q10_12 - Authority and leadership (HE)	.144	.310	-.035	.078	.637	-.012
q10_13_inv - Purchases without consequences (DI)	-.028	.418	.091	-.492	-.526	-.014
q10_14 - Read an explanation of a graphic (AH)	.273	.199	.005	.564	-.025	-.044
q11_b - Bat and Ball (DI)	-.096	.134	-.099	.062	.117	.597
q12_b - Machine Indicator (DI)	.195	-.219	.035	-.126	-.166	.669
q13_b - Lily Indicator (DI)	-.127	.088	.012	-.055	-.018	.632

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 10 iterations.

With 5 Factors:

Rotated Component Matrix^a

	Component				
	1	2	3	4	5
q10_1 - Afraid to Disagree(HE)	.033	.634	-.032	-.192	-.144
q10_2 - Prefer planning (DI)	.233	.297	.234	.584	.051
q10_3 - Time for Personal Life (IC)	.070	.025	.613	.178	-.088
q10_4 - I see what I read (AH)	-.049	.072	.712	.125	-.084
q10_5 - Buy to differentiate (IC)	.153	.000	.635	-.404	.038
q10_6_inv - Buy for my family (IC)	-.155	-.344	-.297	.011	-.128
q10_7 - Detailed oriented (AH)	.826	.155	.014	-.052	-.082
q10_8 - Value expert's opinion (HE)	.037	.628	.171	.220	.047
q10_9 - Enjoy deciphering graphs (AH)	.208	.372	.334	.370	.178
q10_10 - Like detailed explanation (AH)	.594	.135	.290	.205	.106
q10_11 - Interested in parts (AH)	.814	.114	.033	.000	-.101
q10_12 - Authority and leadership (HE)	.196	.344	.331	-.231	.076
q10_13_inv - Purchases without consequences (DI)	-.064	-.256	-.030	.790	.002
q10_14 - Read an explanation of a graphic (AH)	.294	.545	-.062	-.015	-.064
q11_b - Bat and Ball (DI)	-.074	.138	-.021	-.034	.618
q12_b - Machine Indicator (DI)	.179	-.291	-.091	.003	.623
q13_b - Lily Indicator (DI)	-.120	-.013	.013	.077	.635

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 8 iterations.

With 4 Factors:

Rotated Component Matrix^a

	Component			
	1	2	3	4
q10_1 - Afraid to Disagree(HE)	.087	.212	.406	-.227
q10_2 - Prefer planning (DI)	.582	.320	-.274	.024
q10_3 - Time for Personal Life (IC)	.578	-.017	.079	-.079
q10_4 - I see what I read (AH)	.647	-.136	.176	-.087
q10_5 - Buy to differentiate (IC)	.294	-.007	.570	.059
q10_6_inv - Buy for my family (IC)	-.349	-.194	-.267	-.093
q10_7 - Detailed oriented (AH)	.023	.811	.124	-.049
q10_8 - Value expert's opinion (HE)	.464	.215	.141	-.037
q10_9 - Enjoy deciphering graphs (AH)	.583	.281	-.023	.141
q10_10 - Like detailed explanation (AH)	.375	.561	.005	.126
q10_11 - Interested in parts (AH)	.049	.789	.070	-.063
q10_12 - Authority and leadership (HE)	.260	.206	.462	.046
q10_13_inv - Purchases without consequences (DI)	.293	-.057	-.777	.027
q10_14 - Read an explanation of a graphic (AH)	.123	.450	.219	-.120
q11_b - Bat and Ball (DI)	.039	-.036	.106	.587
q12_b - Machine Indicator (DI)	-.147	.086	-.124	.665
q13_b - Lily Indicator (DI)	.073	-.121	-.038	.621

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

Trial 2: Extraction with “Eigenvalue over 1” option with removal of extraneous questions (q10_2, q10_4, q10_9, q10_13_inv).

This yields a total of 4 factors.

Rotated Component Matrix^a

	Component			
	1	2	3	4
q10_1 - Afraid to Disagree(HE)	.093	-.060	-.135	.802
q10_3 - Time for Personal Life (IC)	.059	.422	.058	.215
q10_5 - Buy to differentiate (IC)	.072	.707	-.042	-.060
q10_6_inv - Buy for my family (IC)	-.207	-.181	-.182	-.480
q10_7 - Detailed oriented (AH)	.825	.082	-.098	.107
q10_8 - Value expert's opinion (HE)	.069	.468	.009	.400
q10_10 - Like detailed explanation (AH)	.618	.327	.122	.038
q10_11 - Interested in parts (AH)	.825	.038	-.099	.150
q10_12 - Authority and leadership (HE)	.147	.673	-.067	-.022
q11_b - Bat and Ball (DI)	-.103	.068	.593	.219
q12_b - Machine Indicator (DI)	.184	-.165	.625	-.309
q13_b - Lily Indicator (DI)	-.085	-.002	.673	-.017

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

With 3 Factors

Rotated Component Matrix^a

	Component		
	1	2	3
q10_1 - Afraid to Disagree(HE)	.121	.347	-.298
q10_3 - Time for Personal Life (IC)	.057	.476	.033
q10_5 - Buy to differentiate (IC)	.055	.574	.004
q10_6_inv - Buy for my family (IC)	-.220	-.411	-.090
q10_7 - Detailed oriented (AH)	.826	.119	-.112
q10_8 - Value expert's opinion (HE)	.072	.606	-.051
q10_10 - Like detailed explanation (AH)	.612	.309	.129
q10_11 - Interested in parts (AH)	.828	.104	-.124
q10_12 - Authority and leadership (HE)	.132	.563	-.029
q11_b - Bat and Ball (DI)	-.094	.208	.539
q12_b - Machine Indicator (DI)	.180	-.258	.667
q13_b - Lily Indicator (DI)	-.082	.033	.661

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 4 iterations.

With 5 Factors

Rotated Component Matrix^a

	Component				
	1	2	3	4	5
q10_1 - Afraid to Disagree(HE)	.142	-.085	-.007	.799	.156
q10_3 - Time for Personal Life (IC)	.013	.176	-.074	-.058	.785
q10_5 - Buy to differentiate (IC)	.057	.644	-.071	-.112	.291
q10_6_inv - Buy for my family (IC)	-.196	.015	-.128	-.238	-.631
q10_7 - Detailed oriented (AH)	.828	.072	-.103	.067	.065
q10_8 - Value expert's opinion (HE)	.121	.529	.156	.482	-.045
q10_10 - Like detailed explanation (AH)	.624	.314	.123	-.016	.098
q10_11 - Interested in parts (AH)	.830	.026	-.099	.109	.066
q10_12 - Authority and leadership (HE)	.164	.719	-.006	.047	-.014
q11_b - Bat and Ball (DI)	-.078	.029	.622	.114	.126
q12_b - Machine Indicator (DI)	.162	-.221	.521	-.468	.073
q13_b - Lily Indicator (DI)	-.055	.035	.713	-.053	-.129

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

Trial 3: Extraction with "Eigenvalue over 1" option. Get rid of q10_6_inv.

This produces 5 Factors

Rotated Component Matrix^a

	Component				
	1	2	3	4	5
q10_1 - Afraid to Disagree(HE)	.056	-.041	.615	-.213	-.133
q10_2 - Prefer planning (DI)	.252	.272	.318	.548	.076
q10_3 - Time for Personal Life (IC)	.085	.628	.020	.139	-.085
q10_4 - I see what I read (AH)	-.032	.718	.063	.082	-.080
q10_5 - Buy to differentiate (IC)	.144	.616	.009	-.458	.071
q10_7 - Detailed oriented (AH)	.829	.008	.133	-.070	-.087
q10_8 - Value expert's opinion (HE)	.051	.184	.661	.172	.099
q10_9 - Enjoy deciphering graphs (AH)	.229	.346	.376	.328	.200
q10_10 - Like detailed explanation (AH)	.598	.303	.144	.163	.129
q10_11 - Interested in parts (AH)	.815	.028	.094	-.018	-.107
q10_12 - Authority and leadership (HE)	.196	.314	.357	-.279	.116
q10_13_inv - Purchases without consequences (DI)	-.064	.025	-.211	.798	.007
q10_14 - Read an explanation of a graphic (AH)	.318	-.064	.522	-.033	-.061
q11_b - Bat and Ball (DI)	-.060	-.038	.114	-.042	.623
q12_b - Machine Indicator (DI)	.192	-.115	-.356	.028	.574
q13_b - Lily Indicator (DI)	-.116	.020	-.010	.062	.658

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 10 iterations.

If you get rid of q10_9:

Rotated Component Matrix^a

	Component				
	1	2	3	4	5
q10_1 - Afraid to Disagree(HE)	.040	-.040	.653	-.209	-.096
q10_2 - Prefer planning (DI)	.280	.338	.340	.521	.119
q10_3 - Time for Personal Life (IC)	.089	.636	.042	.108	-.059
q10_4 - I see what I read (AH)	-.023	.729	.068	.041	-.058
q10_5 - Buy to differentiate (IC)	.147	.577	-.045	-.516	.049
q10_7 - Detailed oriented (AH)	.825	-.008	.134	-.090	-.091
q10_8 - Value expert's opinion (HE)	.084	.231	.620	.113	.112
q10_10 - Like detailed explanation (AH)	.617	.311	.116	.105	.123
q10_11 - Interested in parts (AH)	.811	.014	.100	-.037	-.109
q10_12 - Authority and leadership (HE)	.213	.308	.293	-.340	.101
q10_13_inv - Purchases without consequences (DI)	-.034	.097	-.186	.808	.030
q10_14 - Read an explanation of a graphic (AH)	.315	-.045	.554	-.030	-.025
q11_b - Bat and Ball (DI)	-.053	-.030	.103	-.049	.636
q12_b - Machine Indicator (DI)	.193	-.136	-.374	.023	.556
q13_b - Lily Indicator (DI)	-.112	.033	.005	.069	.686

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Clarence Lee
 March 31, 2008
 Suruga Morphing Project

Exploratory Factor Analysis 5

These analyses are done by inverting questions q10_6 and q10_13. In addition, q11_b, q12_b, and q13_b are all binary versions of q11, q12, and q13, with 1 denoting impulsive and 0 denoting deliberative. This is done with the following rules:

If q11 = 10, then q11_b = 1, else q11_b=0
If q11 = 100, then q11_b = 1, else q11_b=0
If q11 = 24, then q11_b = 1, else q11_b=0

I've also discovered a coding error for q10_13 in version 3. The error is that q10_13_inv is NOT the inverse of q10_13, it is the same. Hence, in Analysis 3, q10_13_inv yielded the same factor score as q10_13

Trial 1: Extraction with "Eigenvalue over 1" option.

This yields a total of 6 factors.

Rotated Component Matrix^a

	Component					
	1	2	3	4	5	6
q10_1 - Afraid to Disagree(HE)	.008	.067	.063	.741	.032	-.108
q10_2 - Prefer planning (DI)	.230	.615	.266	.024	-.191	.029
q10_3 - Time for Personal Life (IC)	.080	.104	.707	.030	.019	-.053
q10_4 - I see what I read (AH)	-.047	.138	.744	.032	.141	-.064
q10_5 - Buy to differentiate (IC)	.119	-.033	.319	-.096	.729	-.011
q10_6_inv - Buy for my family (IC)	-.147	-.072	-.428	-.441	-.003	-.179
q10_7 - Detailed oriented (AH)	.816	.062	-.008	.182	.096	-.073
q10_8 - Value expert's opinion (HE)	-.009	.695	-.057	.231	.253	-.040
q10_9 - Enjoy deciphering graphs (AH)	.185	.599	.234	.067	.088	.133
q10_10 - Like detailed explanation (AH)	.579	.361	.172	-.060	.161	.072
q10_11 - Interested in parts (AH)	.808	.069	.027	.137	.056	-.090
q10_12 - Authority and leadership (HE)	.144	.310	-.035	.078	.637	-.012
q10_13_inv - Purchases without consequences (DI)	-.028	.418	.091	-.492	-.526	-.014
q10_14 - Read an explanation of a graphic (AH)	.273	.199	.005	.564	-.025	-.044
q11_b - Bat and Ball (DI)	-.096	.134	-.099	.062	.117	.597
q12_b - Machine Indicator (DI)	.195	-.219	.035	-.126	-.166	.669
q13_b - Lily Indicator (DI)	-.127	.088	.012	-.055	-.018	.632

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 10 iterations.

With 5 Factors:

Rotated Component Matrix^a

	Component				
	1	2	3	4	5
q10_1 - Afraid to Disagree(HE)	.033	.634	-.032	-.192	-.144
q10_2 - Prefer planning (DI)	.233	.297	.234	.584	.051
q10_3 - Time for Personal Life (IC)	.070	.025	.613	.178	-.088
q10_4 - I see what I read (AH)	-.049	.072	.712	.125	-.084
q10_5 - Buy to differentiate (IC)	.153	.000	.635	-.404	.038
q10_6_inv - Buy for my family (IC)	-.155	-.344	-.297	.011	-.128
q10_7 - Detailed oriented (AH)	.826	.155	.014	-.052	-.082
q10_8 - Value expert's opinion (HE)	.037	.628	.171	.220	.047
q10_9 - Enjoy deciphering graphs (AH)	.208	.372	.334	.370	.178
q10_10 - Like detailed explanation (AH)	.594	.135	.290	.205	.106
q10_11 - Interested in parts (AH)	.814	.114	.033	.000	-.101
q10_12 - Authority and leadership (HE)	.196	.344	.331	-.231	.076
q10_13_inv - Purchases without consequences (DI)	-.064	-.256	-.030	.790	.002
q10_14 - Read an explanation of a graphic (AH)	.294	.545	-.062	-.015	-.064
q11_b - Bat and Ball (DI)	-.074	.138	-.021	-.034	.618
q12_b - Machine Indicator (DI)	.179	-.291	-.091	.003	.623
q13_b - Lily Indicator (DI)	-.120	-.013	.013	.077	.635

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 8 iterations.

With 4 Factors:

Rotated Component Matrix^a

	Component			
	1	2	3	4
q10_1 - Afraid to Disagree(HE)	.087	.212	.406	-.227
q10_2 - Prefer planning (DI)	.582	.320	-.274	.024
q10_3 - Time for Personal Life (IC)	.578	-.017	.079	-.079
q10_4 - I see what I read (AH)	.647	-.136	.176	-.087
q10_5 - Buy to differentiate (IC)	.294	-.007	.570	.059
q10_6_inv - Buy for my family (IC)	-.349	-.194	-.267	-.093
q10_7 - Detailed oriented (AH)	.023	.811	.124	-.049
q10_8 - Value expert's opinion (HE)	.464	.215	.141	-.037
q10_9 - Enjoy deciphering graphs (AH)	.583	.281	-.023	.141
q10_10 - Like detailed explanation (AH)	.375	.561	.005	.126
q10_11 - Interested in parts (AH)	.049	.789	.070	-.063
q10_12 - Authority and leadership (HE)	.260	.206	.462	.046
q10_13_inv - Purchases without consequences (DI)	.293	-.057	-.777	.027
q10_14 - Read an explanation of a graphic (AH)	.123	.450	.219	-.120
q11_b - Bat and Ball (DI)	.039	-.036	.106	.587
q12_b - Machine Indicator (DI)	-.147	.086	-.124	.665
q13_b - Lily Indicator (DI)	.073	-.121	-.038	.621

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

Trial 2: Extraction with “Eigenvalue over 1” option with removal of extraneous questions (q10_2, q10_4, q10_9, q10_13_inv).

This yields a total of 4 factors.

Rotated Component Matrix^a

	Component			
	1	2	3	4
q10_1 - Afraid to Disagree(HE)	.093	-.060	-.135	.802
q10_3 - Time for Personal Life (IC)	.059	.422	.058	.215
q10_5 - Buy to differentiate (IC)	.072	.707	-.042	-.060
q10_6_inv - Buy for my family (IC)	-.207	-.181	-.182	-.480
q10_7 - Detailed oriented (AH)	.825	.082	-.098	.107
q10_8 - Value expert's opinion (HE)	.069	.468	.009	.400
q10_10 - Like detailed explanation (AH)	.618	.327	.122	.038
q10_11 - Interested in parts (AH)	.825	.038	-.099	.150
q10_12 - Authority and leadership (HE)	.147	.673	-.067	-.022
q11_b - Bat and Ball (DI)	-.103	.068	.593	.219
q12_b - Machine Indicator (DI)	.184	-.165	.625	-.309
q13_b - Lily Indicator (DI)	-.085	-.002	.673	-.017

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

With 3 Factors

Rotated Component Matrix^a

	Component		
	1	2	3
q10_1 - Afraid to Disagree(HE)	.121	.347	-.298
q10_3 - Time for Personal Life (IC)	.057	.476	.033
q10_5 - Buy to differentiate (IC)	.055	.574	.004
q10_6_inv - Buy for my family (IC)	-.220	-.411	-.090
q10_7 - Detailed oriented (AH)	.826	.119	-.112
q10_8 - Value expert's opinion (HE)	.072	.606	-.051
q10_10 - Like detailed explanation (AH)	.612	.309	.129
q10_11 - Interested in parts (AH)	.828	.104	-.124
q10_12 - Authority and leadership (HE)	.132	.563	-.029
q11_b - Bat and Ball (DI)	-.094	.208	.539
q12_b - Machine Indicator (DI)	.180	-.258	.667
q13_b - Lily Indicator (DI)	-.082	.033	.661

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 4 iterations.

With 5 Factors

Rotated Component Matrix^a

	Component				
	1	2	3	4	5
q10_1 - Afraid to Disagree(HE)	.142	-.085	-.007	.799	.156
q10_3 - Time for Personal Life (IC)	.013	.176	-.074	-.058	.785
q10_5 - Buy to differentiate (IC)	.057	.644	-.071	-.112	.291
q10_6_inv - Buy for my family (IC)	-.196	.015	-.128	-.238	-.631
q10_7 - Detailed oriented (AH)	.828	.072	-.103	.067	.065
q10_8 - Value expert's opinion (HE)	.121	.529	.156	.482	-.045
q10_10 - Like detailed explanation (AH)	.624	.314	.123	-.016	.098
q10_11 - Interested in parts (AH)	.830	.026	-.099	.109	.066
q10_12 - Authority and leadership (HE)	.164	.719	-.006	.047	-.014
q11_b - Bat and Ball (DI)	-.078	.029	.622	.114	.126
q12_b - Machine Indicator (DI)	.162	-.221	.521	-.468	.073
q13_b - Lily Indicator (DI)	-.055	.035	.713	-.053	-.129

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

Trial 3: Extraction with "Eigenvalue over 1" option. Get rid of q10_6_inv.

This produces 5 Factors

Rotated Component Matrix^a

	Component				
	1	2	3	4	5
q10_1 - Afraid to Disagree(HE)	.056	-.041	.615	-.213	-.133
q10_2 - Prefer planning (DI)	.252	.272	.318	.548	.076
q10_3 - Time for Personal Life (IC)	.085	.628	.020	.139	-.085
q10_4 - I see what I read (AH)	-.032	.718	.063	.082	-.080
q10_5 - Buy to differentiate (IC)	.144	.616	.009	-.458	.071
q10_7 - Detailed oriented (AH)	.829	.008	.133	-.070	-.087
q10_8 - Value expert's opinion (HE)	.051	.184	.661	.172	.099
q10_9 - Enjoy deciphering graphs (AH)	.229	.346	.376	.328	.200
q10_10 - Like detailed explanation (AH)	.598	.303	.144	.163	.129
q10_11 - Interested in parts (AH)	.815	.028	.094	-.018	-.107
q10_12 - Authority and leadership (HE)	.196	.314	.357	-.279	.116
q10_13_inv - Purchases without consequences (DI)	-.064	.025	-.211	.798	.007
q10_14 - Read an explanation of a graphic (AH)	.318	-.064	.522	-.033	-.061
q11_b - Bat and Ball (DI)	-.060	-.038	.114	-.042	.623
q12_b - Machine Indicator (DI)	.192	-.115	-.356	.028	.574
q13_b - Lily Indicator (DI)	-.116	.020	-.010	.062	.658

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 10 iterations.

Trial 4: If you get rid of q10_6_inv and q10_9:

Rotated Component Matrix^a

	Component				
	1	2	3	4	5
q10_1 - Afraid to Disagree(HE)	.040	-.040	.653	-.209	-.096
q10_2 - Prefer planning (DI)	.280	.338	.340	.521	.119
q10_3 - Time for Personal Life (IC)	.089	.636	.042	.108	-.059
q10_4 - I see what I read (AH)	-.023	.729	.068	.041	-.058
q10_5 - Buy to differentiate (IC)	.147	.577	-.045	-.516	.049
q10_7 - Detailed oriented (AH)	.825	-.008	.134	-.090	-.091
q10_8 - Value expert's opinion (HE)	.084	.231	.620	.113	.112
q10_10 - Like detailed explanation (AH)	.617	.311	.116	.105	.123
q10_11 - Interested in parts (AH)	.811	.014	.100	-.037	-.109
q10_12 - Authority and leadership (HE)	.213	.308	.293	-.340	.101
q10_13_inv - Purchases without consequences (DI)	-.034	.097	-.186	.808	.030
q10_14 - Read an explanation of a graphic (AH)	.315	-.045	.554	-.030	-.025
q11_b - Bat and Ball (DI)	-.053	-.030	.103	-.049	.636
q12_b - Machine Indicator (DI)	.193	-.136	-.374	.023	.556
q13_b - Lily Indicator (DI)	-.112	.033	.005	.069	.686

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

This is the most important slide. Page 9.

Trial 5: If you get rid of q10_6_inv, q10_9, and q10_12:

Rotated Component Matrix^a

	Component				
	1	2	3	4	5
q10_1 - Afraid to Disagree(HE)	.051	.024	.691	-.274	-.036
q10_2 - Prefer planning (DI)	.264	.268	.322	.586	.092
q10_3 - Time for Personal Life (IC)	.086	.650	.064	.129	-.032
q10_4 - I see what I read (AH)	-.019	.739	.086	.087	-.046
q10_5 - Buy to differentiate (IC)	.177	.624	-.030	-.440	.052
q10_7 - Detailed oriented (AH)	.828	-.005	.132	-.066	-.085
q10_8 - Value expert's opinion (HE)	.092	.189	.605	.195	.075
q10_10 - Like detailed explanation (AH)	.617	.288	.109	.171	.111
q10_11 - Interested in parts (AH)	.813	.028	.107	-.034	-.091
q10_13_inv - Purchases without consequences (DI)	-.069	.009	-.209	.818	-.004
q10_14 - Read an explanation of a graphic (AH)	.321	-.053	.551	-.008	-.026
q11_b - Bat and Ball (DI)	-.047	-.020	.105	-.034	.639
q12_b - Machine Indicator (DI)	.188	-.129	-.375	.019	.560
q13_b - Lily Indicator (DI)	-.114	.046	.015	.063	.704

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Trial 5: If you get rid of q10_6_inv, q10_9, and q10_12, and fix to 4 Factors

Rotated Component Matrix^a

	Component			
	1	2	3	4
q10_1 - Afraid to Disagree(HE)	.247	.165	-.461	-.182
q10_2 - Prefer planning (DI)	.380	.482	.416	.026
q10_3 - Time for Personal Life (IC)	.063	.639	-9.013E-5	-.006
q10_4 - I see what I read (AH)	-.038	.722	-.060	-.027
q10_5 - Buy to differentiate (IC)	.072	.442	-.507	.132
q10_7 - Detailed oriented (AH)	.816	-.030	-.097	-.028
q10_8 - Value expert's opinion (HE)	.284	.409	-.022	-.063
q10_10 - Like detailed explanation (AH)	.607	.310	.083	.151
q10_11 - Interested in parts (AH)	.794	.001	-.065	-.029
q10_13_inv - Purchases without consequences (DI)	-.063	.152	.831	.002
q10_14 - Read an explanation of a graphic (AH)	.483	.103	-.157	-.129
q11_b - Bat and Ball (DI)	-.017	.035	-.070	.585
q12_b - Machine Indicator (DI)	.063	-.219	.138	.640
q13_b - Lily Indicator (DI)	-.106	.098	.035	.662

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Trial 6: If you get rid of q10_6_inv, q10_9, q10_12, q10_2, and q10_13_inv

Rotated Component Matrix^a

	Component			
	1	2	3	4
q10_1 - Afraid to Disagree(HE)	.060	-2.359E-5	.719	-.065
q10_3 - Time for Personal Life (IC)	.076	.669	.058	-.008
q10_4 - I see what I read (AH)	-.030	.752	.061	-.034
q10_5 - Buy to differentiate (IC)	.141	.586	.039	-.015
q10_7 - Detailed oriented (AH)	.830	.017	.134	-.094
q10_8 - Value expert's opinion (HE)	.105	.208	.624	.140
q10_10 - Like detailed explanation (AH)	.619	.327	.081	.143
q10_11 - Interested in parts (AH)	.810	.044	.111	-.102
q10_14 - Read an explanation of a graphic (AH)	.346	-.024	.508	-.012
q11_b - Bat and Ball (DI)	-.051	-.051	.134	.622
q12_b - Machine Indicator (DI)	.193	-.119	-.411	.540
q13_b - Lily Indicator (DI)	-.100	.064	-.017	.722

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

```

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collectivistic_verbal_new egalitarian_new impulsive_
new AH_AH AH_DI AH_HE AH_IC DI_AH DI_DI DI_HE DI_IC HE_AH HE_DI HE_HE HE_IC IC_AH IC_DI
IC_HE IC_IC
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egalitarian_new impulsive_new AH_AH AH_
DI_AH HE_AH HE_DI HE_HE HE_IC IC_AH IC_DI IC_HE IC_IC.

```

Univariate Analysis of Variance - Prm calculated from Q6Su * Q9Su

Notes

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	Cases Used	Statistics are based on all cases with valid data for all variables in the model.

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[Suruga_16x16] C:\Documents and Settings\RA1\Desktop\Suruga Data\Suruga CS As 256 reduced 040708.sav

Between-Subjects Factors

		N
A0H1_morph	0	56
	1	44
D0I1_morph	0	55
	1	45
H0E1_morph	0	51
	1	49
I0C1_morph	0	50
	1	50
holistic_new	0	64
	1	36
collectivistic_verbal_new	0	58
	1	42
egalitarian_new	0	45

	1	55
impulsive_new	0	45
	1	55
Morph to Style Match	0	48
(IF(AND(Morph=Style),1,0)	1	52
Morph to Style Match	0	41
(IF(AND(Morph=Style),1,0)	1	59
Morph to Style Match	0	49
(IF(AND(Morph=Style),1,0)	1	51
Morph to Style Match	0	56
(IF(AND(Morph=Style),1,0)	1	44
Morph to Style Match	0	55
(IF(AND(Morph=Style),1,0)	1	45
Morph to Style Match	0	44
(IF(AND(Morph=Style),1,0)	1	56
Morph to Style Match	0	60
(IF(AND(Morph=Style),1,0)	1	40
Morph to Style Match	0	55
(IF(AND(Morph=Style),1,0)	1	45
Morph to Style Match	0	53
(IF(AND(Morph=Style),1,0)	1	47
Morph to Style Match	0	52
(IF(AND(Morph=Style),1,0)	1	48
Morph to Style Match	0	48
(IF(AND(Morph=Style),1,0)	1	52
Morph to Style Match	0	49
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Morph to Style Match	0	56
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Morph to Style Match	0	55
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Morph to Style Match	0	49
(IF(AND(Morph=Style),1,0)	1	51
Morph to Style Match	0	52
(IF(AND(Morph=Style),1,0)	1	48

Tests of Between-Subjects Effects

Dependent Variable: Logit of (Q6Su * Q9Su)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	35.831 ^a	24	1.493	1.583	.069
Intercept	97.832	1	97.832	103.766	.000
A0H1_morph	1.012	1	1.012	1.073	.304
D0I1_morph	.523	1	.523	.555	.459
H0E1_morph	.233	1	.233	.247	.620
I0C1_morph	.563	1	.563	.597	.442
holistic_new	2.434	1	2.434	2.582	.112
collectivistic_verbal_new	7.140	1	7.140	7.573	.007
egalitarian_new	6.259	1	6.259	6.638	.012
impulsive_new	.678	1	.678	.719	.399
AH_AH	.096	1	.096	.101	.751
AH_DI	.052	1	.052	.056	.814
AH_HE	.015	1	.015	.015	.902
AH_IC	.475	1	.475	.504	.480
DI_AH	3.463	1	3.463	3.673	.059
DI_DI	.335	1	.335	.355	.553
DI_HE	.304	1	.304	.322	.572
DI_IC	4.063	1	4.063	4.310	.041
HE_AH	.687	1	.687	.728	.396
HE_DI	1.061	1	1.061	1.125	.292
HE_HE	.269	1	.269	.285	.595
HE_IC	.094	1	.094	.100	.753
IC_AH	.244	1	.244	.259	.613
IC_DI	.259	1	.259	.274	.602
IC_HE	2.637	1	2.637	2.797	.099
IC_IC	1.644	1	1.644	1.744	.191
Error	70.711	75	.943		
Total	294.089	100			
Corrected Total	106.542	99			

a. R Squared = .336 (Adjusted R Squared = .124)

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 /NOORIGIN
 /DEPENDENT LPrmSuruga

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 DI_IC IC_HE IC_IC DI_DI AH_AH HE_HE.

Stepwise Regression

Notes

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	Cases Used	Statistics are based on cases with no missing values for any variable used.
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Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	egalitarian_new		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
2	collectivistic_verbal_new		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
3	DI to AH (IF(AND(Morph=Style),1,0))		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
4	IC to HE (IF(AND(Morph=Style),1,0))		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
5	DI to IC (IF(AND(Morph=Style),1,0))		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a. Dependent Variable: Logit of (Q6Su * Q9Su)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.253 ^a	.064	.054	1.00874
2	.338 ^b	.115	.096	.98617
3	.390 ^c	.152	.125	.97025
4	.432 ^d	.186	.152	.95523
5	.482 ^e	.232	.192	.93271

a. Predictors: (Constant), egalitarian_new

- b. Predictors: (Constant), egalitarian_new, collectivistic_verbal_new
- c. Predictors: (Constant), egalitarian_new, collectivistic_verbal_new, DI to AH (IF(AND(Morph=Style),1,0))
- d. Predictors: (Constant), egalitarian_new, collectivistic_verbal_new, DI to AH (IF(AND(Morph=Style),1,0)), IC to HE (IF(AND(Morph=Style),1,0))
- e. Predictors: (Constant), egalitarian_new, collectivistic_verbal_new, DI to AH (IF(AND(Morph=Style),1,0)), IC to HE (IF(AND(Morph=Style),1,0)), DI to IC (IF(AND(Morph=Style),1,0))

ANOVA^f

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.822	1	6.822	6.705	.011 ^a
	Residual	99.720	98	1.018		
	Total	106.542	99			
2	Regression	12.206	2	6.103	6.275	.003 ^b
	Residual	94.336	97	.973		
	Total	106.542	99			
3	Regression	16.169	3	5.390	5.725	.001 ^c
	Residual	90.373	96	.941		
	Total	106.542	99			
4	Regression	19.858	4	4.965	5.441	.001 ^d
	Residual	86.684	95	.912		
	Total	106.542	99			
5	Regression	24.768	5	4.954	5.694	.000 ^e
	Residual	81.774	94	.870		
	Total	106.542	99			

- a. Predictors: (Constant), egalitarian_new
- b. Predictors: (Constant), egalitarian_new, collectivistic_verbal_new
- c. Predictors: (Constant), egalitarian_new, collectivistic_verbal_new, DI to AH (IF(AND(Morph=Style),1,0))
- d. Predictors: (Constant), egalitarian_new, collectivistic_verbal_new, DI to AH (IF(AND(Morph=Style),1,0)), IC to HE (IF(AND(Morph=Style),1,0))
- e. Predictors: (Constant), egalitarian_new, collectivistic_verbal_new, DI to AH (IF(AND(Morph=Style),1,0)), IC to HE (IF(AND(Morph=Style),1,0)), DI to IC (IF(AND(Morph=Style),1,0))
- f. Dependent Variable: Logit of (Q6Su * Q9Su)

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.081	.150		-7.187	.000
	egalitarian_new	-.525	.203	-.253	-2.589	.011
2	(Constant)	-1.239	.162		-7.663	.000
	egalitarian_new	-.600	.201	-.289	-2.989	.004
	collectivistic_verbal_new	.476	.202	.228	2.353	.021
3	(Constant)	-1.445	.188		-7.683	.000
	egalitarian_new	-.576	.198	-.278	-2.911	.004
	collectivistic_verbal_new	.504	.200	.241	2.524	.013
	DI to AH (IF(AND(Morph=Style),1,0))	.402	.196	.194	2.052	.043
4	(Constant)	-1.234	.213		-5.794	.000
	egalitarian_new	-.571	.195	-.275	-2.929	.004
	collectivistic_verbal_new	.464	.197	.222	2.352	.021
	DI to AH (IF(AND(Morph=Style),1,0))	.400	.193	.193	2.075	.041
	IC to HE (IF(AND(Morph=Style),1,0))	-.386	.192	-.187	-2.011	.047
5	(Constant)	-1.421	.222		-6.391	.000
	egalitarian_new	-.565	.190	-.272	-2.969	.004
	collectivistic_verbal_new	.510	.194	.244	2.631	.010
	DI to AH (IF(AND(Morph=Style),1,0))	.391	.188	.188	2.073	.041
	IC to HE (IF(AND(Morph=Style),1,0))	-.455	.190	-.220	-2.399	.018
	DI to IC (IF(AND(Morph=Style),1,0))	.454	.191	.219	2.376	.020

a. Dependent Variable: Logit of (Q6Su * Q9Su)

Excluded Variables^f

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	collectivistic_verbal_new	.228 ^a	2.353	.021	.232	.975
	A0H1_morph	.068 ^a	.694	.490	.070	.999

	D0I1_morph	-.010 ^a	-.103	.918	-.010	.963
	DI to AH (IF(AND(Morph=Style),1,0))	.178 ^a	1.837	.069	.183	.995
	DI to IC (IF(AND(Morph=Style),1,0))	.161 ^a	1.657	.101	.166	.999
	IC to HE (IF(AND(Morph=Style),1,0))	-.208 ^a	-2.172	.032	-.215	1.000
	IC to IC (IF(AND(Morph=Style),1,0))	-.099 ^a	-1.005	.318	-.101	.991
	DI to DI (IF(AND(Morph=Style),1,0))	.127 ^a	1.297	.198	.131	.995
	AH to AH (IF(AND(Morph=Style),1,0))	-.018 ^a	-.187	.852	-.019	.997
	HE to HE (IF(AND(Morph=Style),1,0))	-.092 ^a	-.944	.347	-.095	.999
2	A0H1_morph	.093 ^b	.970	.334	.099	.987
	D0I1_morph	.010 ^b	.106	.915	.011	.955
	DI to AH (IF(AND(Morph=Style),1,0))	.194 ^b	2.052	.043	.205	.991
	DI to IC (IF(AND(Morph=Style),1,0))	.189 ^b	1.993	.049	.199	.986
	IC to HE (IF(AND(Morph=Style),1,0))	-.188 ^b	-1.987	.050	-.199	.990
	IC to IC (IF(AND(Morph=Style),1,0))	-.101 ^b	-1.049	.297	-.106	.991
	DI to DI (IF(AND(Morph=Style),1,0))	.129 ^b	1.351	.180	.137	.995
	AH to AH (IF(AND(Morph=Style),1,0))	-.046 ^b	-.478	.634	-.049	.982
	HE to HE (IF(AND(Morph=Style),1,0))	-.077 ^b	-.798	.427	-.081	.994
3	A0H1_morph	.093 ^c	.980	.330	.100	.987
	D0I1_morph	.082 ^c	.809	.420	.083	.857
	DI to IC (IF(AND(Morph=Style),1,0))	.185 ^c	1.983	.050	.199	.985
	IC to HE (IF(AND(Morph=Style),1,0))	-.187 ^c	-2.011	.047	-.202	.990
	IC to IC (IF(AND(Morph=Style),1,0))	-.111 ^c	-1.174	.243	-.120	.988

	DI to DI (IF(AND(Morph=Style),1,0))	.140 ^c	1.491	.139	.151	.992
	AH to AH (IF(AND(Morph=Style),1,0))	-.053 ^c	-.562	.576	-.058	.981
	HE to HE (IF(AND(Morph=Style),1,0))	-.088 ^c	-.934	.353	-.095	.991
4	A0H1_morph	.087 ^d	.938	.351	.096	.987
	D0I1_morph	.063 ^d	.630	.530	.065	.849
	DI to IC (IF(AND(Morph=Style),1,0))	.219 ^d	2.376	.020	.238	.962
	IC to IC (IF(AND(Morph=Style),1,0))	-.086 ^d	-.910	.365	-.093	.968
	DI to DI (IF(AND(Morph=Style),1,0))	.135 ^d	1.466	.146	.149	.991
	AH to AH (IF(AND(Morph=Style),1,0))	-.055 ^d	-.588	.558	-.061	.981
	HE to HE (IF(AND(Morph=Style),1,0))	-.079 ^d	-.843	.402	-.087	.988
5	A0H1_morph	.087 ^e	.958	.340	.099	.987
	D0I1_morph	.111 ^e	1.108	.271	.114	.820
	IC to IC (IF(AND(Morph=Style),1,0))	-.093 ^e	-1.011	.314	-.104	.967
	DI to DI (IF(AND(Morph=Style),1,0))	.120 ^e	1.320	.190	.136	.985
	AH to AH (IF(AND(Morph=Style),1,0))	-.037 ^e	-.407	.685	-.042	.974
	HE to HE (IF(AND(Morph=Style),1,0))	-.054 ^e	-.587	.559	-.061	.974

a. Predictors in the Model: (Constant), egalitarian_new

b. Predictors in the Model: (Constant), egalitarian_new, collectivistic_verbal_new

c. Predictors in the Model: (Constant), egalitarian_new, collectivistic_verbal_new, DI to AH (IF(AND(Morph=Style),1,0))

d. Predictors in the Model: (Constant), egalitarian_new, collectivistic_verbal_new, DI to AH (IF(AND(Morph=Style),1,0)), IC to HE (IF(AND(Morph=Style),1,0))

e. Predictors in the Model: (Constant), egalitarian_new, collectivistic_verbal_new, DI to AH (IF(AND(Morph=Style),1,0)), IC to HE (IF(AND(Morph=Style),1,0)), DI to IC (IF(AND(Morph=Style),1,0))

f. Dependent Variable: Logit of (Q6Su * Q9Su)

Acom Analysis (Prm Calculated from Q6 * Q9)

This analysis divides the data by 16 morphs x 16 cognitive/cultural styles: 4 morph dimensions and 4 cognitive/cultural dimensions. This does not include Shane's Questions to test for Impulsive vs. Deliberative dimension. For consistency, we will call impulsive_new in this file Planner vs. Non-Planner.

Univariate Analysis of Variance

	Notes	
	Output Created	2008-04-21T22:39:29.140
	Comments	
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Input	File Label	Aggregated File
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	N of Rows in Working Data File	206
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the model.

```

UNIANOVA LPmAcorn_mean BY
A0H1_morph D0I1_morph H0E1_morph
I0C1_morph impulsive_new holistic_new
collectivistic_verbal_new egalitarian_new
AH_AH AH_DI AH_HE AH_IC DI_AH
DI_DI DI_HE DI_IC HE_AH HE_DI HE_HE
HE_IC IC_AH IC_DI IC_HE IC_IC
/METHOD=SSTYPE(3)
/INTERCEPT=INCLUDE
/CRITERIA=ALPHA(0.05)
/DESIGN=A0H1_morph D0I1_morph
H0E1_morph I0C1_morph impulsive_new
holistic_new collectivistic_verbal_new
egalitarian_new AH_AH AH_DI AH_HE
AH_IC DI_AH DI_DI DI_HE DI_IC HE_AH
HE_DI HE_HE HE_IC IC_AH IC_DI IC_HE
IC_IC.

```

Syntax

Resources	Processor Time	0:00:00.031
	Elapsed Time	0:00:00.048

[acom_age_numloans] C:\Documents and Settings\RA1\Desktop\Suruga Data\Acom CS As 16x16 reduced 042108.sav

Between-Subjects Factors

		N
A0H1_morph	0	32
	1	26
D0I1_morph	0	33
	1	25
H0E1_morph	0	36
	1	22
I0C1_morph	0	37
	1	21
impulsive_new	0	25
	1	33
holistic_new	0	36
	1	22
collectivistic_verbal_new	0	35
	1	23

egalitarian_new	0	21
	1	37
AH to AH	0	30
(IF(AND(Morph=Style),1,0)	1	28
AH to DI	0	27
(IF(AND(Morph=Style),1,0)	1	31
AH to HE	0	29
(IF(AND(Morph=Style),1,0)	1	29
AH to IC	0	29
(IF(AND(Morph=Style),1,0)	1	29
DI to AH	0	33
(IF(AND(Morph=Style),1,0)	1	25
DI to DI	0	32
(IF(AND(Morph=Style),1,0)	1	26
DI to HE	0	34
(IF(AND(Morph=Style),1,0)	1	24
DI to IC	0	32
(IF(AND(Morph=Style),1,0)	1	26
HE to AH	0	34
(IF(AND(Morph=Style),1,0)	1	24
HE to DI	0	31
(IF(AND(Morph=Style),1,0)	1	27
HE to HE	0	29
(IF(AND(Morph=Style),1,0)	1	29
HE to IC	0	27
(IF(AND(Morph=Style),1,0)	1	31
IC to AH	0	33
(IF(AND(Morph=Style),1,0)	1	25
IC to DI	0	30
(IF(AND(Morph=Style),1,0)	1	28
IC to HE	0	32
(IF(AND(Morph=Style),1,0)	1	26
IC to IC	0	28
(IF(AND(Morph=Style),1,0)	1	30

Tests of Between-Subjects Effects

Dependent Variable:LPmAcorn_mean

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	25.733 ^a	24	1.072	1.169	.334
Intercept	27.606	1	27.606	30.085	.000
A0H1_morph	1.927	1	1.927	2.100	.157
D0I1_morph	3.166	1	3.166	3.451	.072
H0E1_morph	.890	1	.890	.970	.332
I0C1_morph	.016	1	.016	.017	.897
impulsive_new	3.966	1	3.966	4.322	.045
holistic_new	1.840	1	1.840	2.006	.166
collectivistic_verbal_new	2.478	1	2.478	2.700	.110
egalitarian_new	5.104	1	5.104	5.562	.024
AH_AH	.069	1	.069	.075	.786
AH_DI	.947	1	.947	1.032	.317
AH_HE	.933	1	.933	1.017	.321
AH_IC	.480	1	.480	.524	.474
DI_AH	2.724	1	2.724	2.969	.094
DI_DI	.880	1	.880	.959	.334
DI_HE	.249	1	.249	.271	.606
DI_IC	.489	1	.489	.533	.470
HE_AH	2.578	1	2.578	2.810	.103
HE_DI	.064	1	.064	.069	.794
HE_HE	.473	1	.473	.515	.478
HE_IC	1.321	1	1.321	1.440	.239
IC_AH	.320	1	.320	.349	.559
IC_DI	1.931	1	1.931	2.104	.156
IC_HE	.441	1	.441	.481	.493
IC_IC	.005	1	.005	.005	.944
Error	30.280	33	.918		
Total	216.523	58			
Corrected Total	56.013	57			

a. R Squared = .459 (Adjusted R Squared = .066)

REGRESSION

```

/MISSING LISTWISE
/STATISTICS COEFF OUTS R ANOVA
/CRITERIA=PIN(.05) POUT(.10)
/NOORIGIN
/DEPENDENT LPrmAcom_mean
/METHOD=STEPWISE D0I1_morph impulsive_new collectivistic_verbal_new egalitarian_new DI_AH
HE_AH AH_AH DI_DI HE_HE IC_IC.

```

Stepwise Regression

Notes

Output Created	2008-04-21T22:43:06.187	
Comments		
Input	Data	C:\Documents and Settings\RA1\Desktop\Suruga Data\Acom CS As 16x16 reduced 042108.sav
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	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	206
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax	REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT LPmAcom_mean /METHOD=STEPWISE D0I1_morph impulsive_new collectivistic_verbal_new egalitarian_new DI_AH HE_AH AH_AH DI_DI HE_HE IC_IC.	
Resources	Processor Time	0:00:00.031
	Elapsed Time	0:00:00.094
	Memory Required	6020 bytes
	Additional Memory Required for Residual Plots	0 bytes

[acom_age_numloans] C:\Documents and Settings\RA1\Desktop\Suruga Data\Acom CS As 16x16 reduced 042108.sav

Model	Variables Entered	Variables Removed	Method
1	DI to AH (IF(AND(Morph=Style),1,0))		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a. Dependent Variable: LPPrmAcom_mean

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.270 ^a	.073	.057	.96283

a. Predictors: (Constant), DI to AH (IF(AND(Morph=Style),1,0))

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.098	1	4.098	4.421	.040 ^a
	Residual	51.915	56	.927		
	Total	56.013	57			

a. Predictors: (Constant), DI to AH (IF(AND(Morph=Style),1,0))

b. Dependent Variable: LPPrmAcom_mean

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.895	.168		-11.306	.000
	DI to AH (IF(AND(Morph=Style),1,0))	.537	.255	.270	2.103	.040

a. Dependent Variable: LPPrmAcom_mean

Excluded Variables^b

Model	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics	
					Tolerance	
1	D0I1_morph	.249 ^a	1.912	.061	.250	.930
	impulsive_new	.232 ^a	1.841	.071	.241	.997
	collectivistic_verbal_new	.146 ^a	1.127	.265	.150	.981
	egalitarian_new	-.246 ^a	-1.962	.055	-.256	1.000
	HE to AH (IF(AND(Morph=Style),1,0))	.005 ^a	.038	.970	.005	.998
	AH to AH (IF(AND(Morph=Style),1,0))	-.087 ^a	-.673	.504	-.090	1.000
	DI to DI (IF(AND(Morph=Style),1,0))	.114 ^a	.881	.382	.118	1.000
	HE to HE (IF(AND(Morph=Style),1,0))	.043 ^a	.334	.740	.045	.999
	IC to IC (IF(AND(Morph=Style),1,0))	-.013 ^a	-.099	.922	-.013	.979

a. Predictors in the Model: (Constant), DI to AH (IF(AND(Morph=Style),1,0))

b. Dependent Variable: LPmAcorn_mean

Orix Analysis (Prm Calculated from Q6 * Q9)

This analysis divides the data by 16 morphs x 16 cognitive/cultural styles: 4 morph dimensions and 4 cognitive/cultural dimensions. This does not include Shane's Questions to test for Impulsive vs. Deliberative dimension. For consistency, we will call impulsive_new in this file Planner vs. Non-Planner.

```

DATASET ACTIVATE orix_age_numloans.
UNIANOVA LPrmOrix_mean BY A0H1_morph D0I1_morph H0E1_morph I0C1_morph impulsive_new
holistic_new collectivistic_verbal_new egalitari
  an_new AH_AH AH_DI AH_HE AH_IC DI_AH DI_DI DI_HE DI_IC HE_AH HE_DI HE_HE HE_IC IC_AH IC_DI
IC_HE IC_IC
  /METHOD=SSTYPE(3)
  /INTERCEPT=INCLUDE
  /CRITERIA=ALPHA(0.05)
  /DESIGN=A0H1_morph D0I1_morph H0E1_morph I0C1_morph impulsive_new holistic_new
collectivistic_verbal_new egalitarian_new AH_AH AH_
  DI AH_HE AH_IC DI_AH DI_DI DI_HE DI_IC HE_AH HE_DI HE_HE HE_IC IC_AH IC_DI IC_HE IC_IC.

```

Univariate Analysis of Variance

Notes

Output Created	2008-04-21T22:45:02.218	
Comments		
Input	Data	C:\Documents and Settings\RA1\Desktop\Suruga Data\Orix CS As 16x16 reduced 042108.sav
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	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	206
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.

Cases Used		Statistics are based on all cases with valid data for all variables in the model.
Syntax		UNIANOVA LPmOrix_mean BY A0H1_morph D0I1_morph H0E1_morph I0C1_morph impulsive_new holistic_new collectivistic_verbal_new egalitarian_new AH_AH AH_DI AH_HE AH_IC DI_AH DI_DI DI_HE DI_IC HE_AH HE_DI HE_HE HE_IC IC_AH IC_DI IC_HE IC_IC /METHOD=SSTYPE(3) /INTERCEPT=INCLUDE /CRITERIA=ALPHA(0.05) /DESIGN=A0H1_morph D0I1_morph H0E1_morph I0C1_morph impulsive_new holistic_new collectivistic_verbal_new egalitarian_new AH_AH AH_DI AH_HE AH_IC DI_AH DI_DI DI_HE DI_IC HE_AH HE_DI HE_HE HE_IC IC_AH IC_DI IC_HE IC_IC.
Resources	Processor Time	0:00:00.015
	Elapsed Time	0:00:00.063

[orix_age_numloans] C:\Documents and Settings\RA1\Desktop\Suruga Data\Orix CS As 16x16 reduced 042108.sav

Between-Subjects Factors

		N
A0H1_morph	0	73
	1	60
D0I1_morph	0	72
	1	61
H0E1_morph	0	64
	1	69
I0C1_morph	0	79
	1	54
impulsive_new	0	62
	1	71
holistic_new	0	70
	1	63

collectivistic_verbal_new	0	84
	1	49
egalitarian_new	0	59
	1	74
AH to AH	0	61
(IF(AND(Morph=Style),1,0)	1	72
AH to DI	0	63
(IF(AND(Morph=Style),1,0)	1	70
AH to HE	0	70
(IF(AND(Morph=Style),1,0)	1	63
AH to IC	0	70
(IF(AND(Morph=Style),1,0)	1	63
DI to AH	0	68
(IF(AND(Morph=Style),1,0)	1	65
DI to DI	0	68
(IF(AND(Morph=Style),1,0)	1	65
DI to HE	0	73
(IF(AND(Morph=Style),1,0)	1	60
DI to IC	0	68
(IF(AND(Morph=Style),1,0)	1	65
HE to AH	0	68
(IF(AND(Morph=Style),1,0)	1	65
HE to DI	0	68
(IF(AND(Morph=Style),1,0)	1	65
HE to HE	0	65
(IF(AND(Morph=Style),1,0)	1	68
HE to IC	0	66
(IF(AND(Morph=Style),1,0)	1	67
IC to AH	0	71
(IF(AND(Morph=Style),1,0)	1	62
IC to DI	0	65
(IF(AND(Morph=Style),1,0)	1	68
IC to HE	0	64
(IF(AND(Morph=Style),1,0)	1	69
IC to IC	0	65
(IF(AND(Morph=Style),1,0)	1	68

Tests of Between-Subjects Effects

Dependent Variable: LPrmOrix_mean

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	27.834 ^a	24	1.160	.990	.485
Intercept	218.304	1	218.304	186.347	.000
A0H1_morph	.241	1	.241	.206	.651
D0I1_morph	.398	1	.398	.340	.561
H0E1_morph	2.008	1	2.008	1.714	.193
I0C1_morph	4.335	1	4.335	3.701	.057
impulsive_new	.330	1	.330	.282	.596
holistic_new	.143	1	.143	.122	.727
collectivistic_verbal_new	.115	1	.115	.099	.754
egalitarian_new	7.888	1	7.888	6.733	.011
AH_AH	.021	1	.021	.018	.893
AH_DI	.094	1	.094	.080	.777
AH_HE	.072	1	.072	.062	.804
AH_IC	.000	1	.000	.000	.989
DI_AH	4.657	1	4.657	3.976	.049
DI_DI	.320	1	.320	.273	.602
DI_HE	.051	1	.051	.043	.835
DI_IC	.414	1	.414	.353	.554
HE_AH	.413	1	.413	.352	.554
HE_DI	1.442	1	1.442	1.231	.270
HE_HE	.011	1	.011	.010	.923
HE_IC	.682	1	.682	.582	.447
IC_AH	.108	1	.108	.092	.762
IC_DI	1.828	1	1.828	1.560	.214
IC_HE	2.314	1	2.314	1.976	.163
IC_IC	.209	1	.209	.179	.673
Error	126.521	108	1.171		
Total	419.621	133			
Corrected Total	154.355	132			

a. R Squared = .180 (Adjusted R Squared = -.002)

```
REGRESSION
/MISSING LISTWISE
/STATISTICS COEFF OUTS R ANOVA
/CRITERIA=PIN(.05) POUT(.10)
/NOORIGIN
/DEPENDENT LPrmOrix_mean
```

/METHOD=STEPWISE IOC1_morph egalitarian_new DI_AH AH_AH DI_DI HE_HE IC_IC.

Regression

Notes

Output Created		2008-04-21T22:47:42.546
Comments		
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	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	206
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT LPmOrix_mean /METHOD=STEPWISE IOC1_morph egalitarian_new DI_AH AH_AH DI_DI HE_HE IC_IC.
Resources	Processor Time	0:00:00.078
	Elapsed Time	0:00:00.062
	Memory Required	4388 bytes
	Additional Memory Required for Residual Plots	0 bytes

[orix_age_numloans] C:\Documents and Settings\RA1\Desktop\Suruga Data\Orix CS As 16x16 reduced 042108.sav

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	I0C1_morph		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
2	egalitarian_new		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a. Dependent Variable: LPmOrix_mean

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.218 ^a	.048	.040	1.05927
2	.296 ^b	.088	.074	1.04068

a. Predictors: (Constant), I0C1_morph

b. Predictors: (Constant), I0C1_morph, egalitarian_new

ANOVA^c

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.366	1	7.366	6.565	.012 ^a
	Residual	146.988	131	1.122		
	Total	154.355	132			
2	Regression	13.563	2	6.781	6.262	.003 ^b
	Residual	140.792	130	1.083		
	Total	154.355	132			

a. Predictors: (Constant), I0C1_morph

b. Predictors: (Constant), I0C1_morph, egalitarian_new

c. Dependent Variable: LPmOrix_mean

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.218	.119		-10.217	.000
	I0C1_morph	-.479	.187	-.218	-2.562	.012
2	(Constant)	-.986	.152		-6.494	.000
	I0C1_morph	-.453	.184	-.206	-2.459	.015
	egalitarian_new	-.435	.182	-.201	-2.392	.018

a. Dependent Variable: LPmOrix_mean

Excluded Variables^c

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	egalitarian_new	-.201 ^a	-2.392	.018	-.205	.996
	DI to AH (IF(AND(Morph=Style),1,0))	.144 ^a	1.701	.091	.148	.998
	AH to AH (IF(AND(Morph=Style),1,0))	.014 ^a	.168	.867	.015	.995
	DI to DI (IF(AND(Morph=Style),1,0))	.033 ^a	.385	.701	.034	.998
	HE to HE (IF(AND(Morph=Style),1,0))	-.027 ^a	-.310	.757	-.027	.998
	IC to IC (IF(AND(Morph=Style),1,0))	.056 ^a	.627	.532	.055	.930
	2	DI to AH (IF(AND(Morph=Style),1,0))	.149 ^b	1.788	.076	.156	.997
AH to AH (IF(AND(Morph=Style),1,0))		.027 ^b	.322	.748	.028	.991
DI to DI (IF(AND(Morph=Style),1,0))		.039 ^b	.459	.647	.040	.997
HE to HE (IF(AND(Morph=Style),1,0))		-.020 ^b	-.238	.813	-.021	.997
IC to IC (IF(AND(Morph=Style),1,0))		.034 ^b	.391	.696	.034	.920

a. Predictors in the Model: (Constant), I0C1_morph

b. Predictors in the Model: (Constant), I0C1_morph, egalitarian_new

c. Dependent Variable: LPmOrix_mean

Jun 25, 2008 preliminary survey design -- c MIT

SURUGA SURVEY 2

Draft v9 Jun 25, 2008

Sections:

Section 1 = Screening Survey

Section 2 = Pre-Survey

Section 3 = Experiencing the Website

Section 4 = Site Evaluation

Section 5 = Post-Survey

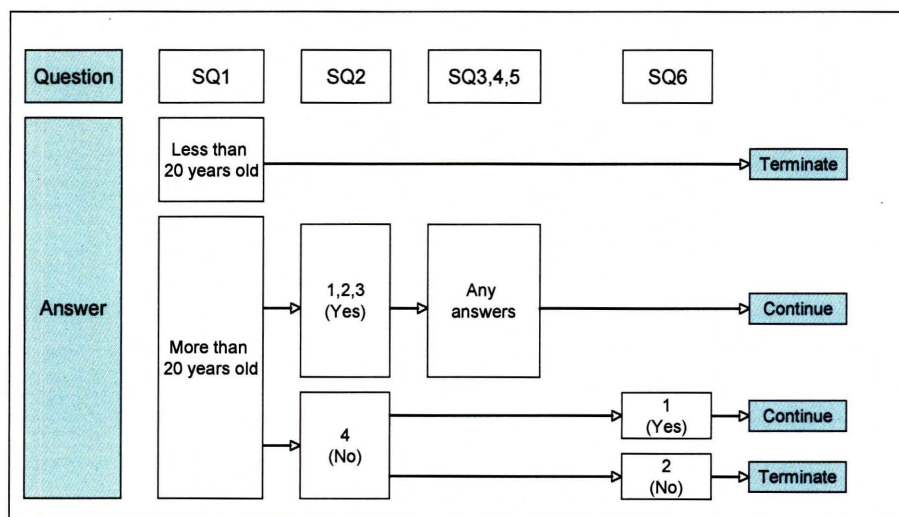
Section 6 = Consumer Characteristics (morphing questionnaire) and Demographics

Section 7 = Suruga Advocacy Survey

SECTION 1: Screening Questions

The first part of the survey is to screen out individuals who don't fit Suruga's target profile.

If answer of SQ1 was 20 or more, and any one of the answers for SQ2 or SQ6 was "Yes", then participant continues with the pre- and post-survey. If SQ1 was less than 20, or both answers for SQ2 and SQ6 were "No", terminate survey.



Instructions:

Our first several questions are for qualification/ screening purposes and they enable us to select individuals who meet our target profile to participant in the survey.

SQ1. What is your age?

() years old

あなたの年齢は？

() 歳

(If the answer for SQ1 was less than 20, terminate this survey.)

SQ2. Have you ever had card loan account?

1. Yes, I had card loan account more than 5 years ago, but I closed it already.
2. Yes, I had card loan account less than 5 years ago, but I closed it already.
3. Yes, I have card loan account now.
4. No, I have never had.

あなたはカードローンの口座を持っていますか？（使っているかどうかは関係なく、持っているかどうかをお答え下さい）

1. 以前持っていたが、今は持っていない（5年以上前）
2. 以前持っていたが、今は持っていない（5年以内）
3. 現在持っている
4. 持ったことがない

(If the answer for SQ2 was “1”, “2”, and “3”, then ask this question.)

SQ3. Have you ever used card loan?

1. Yes, I had used it more than 5 years ago.
2. Yes, I had used it less than 5 years ago.
3. Yes, I am using it now.
4. No, I have never used it.

あなたはこれまでにカードローンを利用したことがありますか？

1. 以前利用していたが現在は利用していない（5年以上前）
2. 以前利用していたが現在は利用していない（5年以内）
3. 現在利用している
4. 利用したことがない

(If the answer for SQ2 was “1”, “2”, or “3”, then ask this question.)

SQ4. What kind of card loan did you have (do you have)? Check all that apply.

1. Card loan offered by bank
2. Card loan offered by bank and consumer finance
3. Card loan offered by credit finance
4. Card loan offered by consumer finance
5. Others ()

どのような種類のカードローンを持っていましたか？ または持っていますか？ 当てはまるものすべてをお答え下さい。

1. 銀行系ローン
2. 銀行と消費者金融の提携ローン（モビット、キャッシングワン、アットローンなど）
3. 信販系ローン
4. 消費者金融系ローン
5. その他 ()

(If the answer for SQ2 was “1”, “2”, or “3”, then ask this question.)

SQ5. How many card loans do you have now?

()

現在は何本の(何社の)カードローンを持っていますか?

()

(If the answer for SQ2 was “4”, then ask this question.)

SQ6. Are you considering a card loan in the near future?

1. Yes
2. No

あなたは近いうちに、カードローンの利用を検討していますか?

1. はい
2. いいえ

(If the answer for SQ6 was “2.No”, terminate this survey.)

SECTION 2: Pre-Survey

CARD LOAN CONSIDERATION, OPINION, PREFERENCE AND ACQUISITION INTENTIONS

Thank you for agreeing to participate in our survey being conducted to help us better understand your card loan preferences. This survey will take approximately 25 - 30 minutes to complete.

アンケートにご協力いただきありがとうございます。このアンケートはカードローンに関して皆様のご意見を伺うことを目的としております。約25分から30分ほどお時間をいただきますが、何卒よろしく願いいたします。

Please read each question carefully before answering it. Even if you are not certain about the exact answer to a question, mark the answer that is closest to your opinion and go to the next question. Your responses will be kept in the strictest of confidence.

ご回答の際、それぞれの質問を良くお読み下さい。もし最適なお答えが見つからない場合は一番近いと思われるものをお選び下さい。いただいたご回答は厳重に管理され、調査目的以外の利用は決してございませんので安心してご回答いただきたいと存じます。

Thank you for your time and effort!

ご協力よろしく願いいたします。

First, we would like to know your consideration, opinions, preferences and acquisition intentions for card loan services. This section will take you approximately 5 minutes to complete. Next, you will be asked to click on a link that will take you to another Website. It takes about 10 minutes to review the site. After reviewing this site we will ask you to indicate your reactions to the site. This will take

about 7 minutes. Finally we will ask you a few demographic questions that will take less than 5 minutes.

それでは早速、本調査に入らせていただきます。全体の流れは以下の通りです。

カードローンに関する、現在の利用、検討の可能性、ご意見、好み、利用意向についてのご質問	約 5 分
別のサイトを閲覧	約 10 分
閲覧していただいたサイトに関する質問	約 7 分
統計上の質問	5 分弱

Caution!

Please browse the site enough and carefully in order to have a meaningful answer for the survey. Otherwise (if we make a judgment that you don't have enough experience), you may **not be eligible for the survey**. We are taking a record of your visit history. We will ask some questions about the site after the site experience.

注意！

アンケートに意味のある回答ができるよう、十分に、注意深くサイトを見て下さい。閲覧の履歴は記録されています。この後でサイトに関するいくつかの質問があります。サイトを十分に閲覧していないと判断される場合は**アンケートの回答は無効**になることがありますので、ご注意ください。

For the people who is using card loan now

Please browse the site and answer the question as if you refinanced the loan.

カードローンを、既にご利用中の方へ

現在、お借り入れのカードローンを借り換えるつもりでサイトを閲覧し、アンケートにご回答ください。

{Note to AMS – Use red bold font for “**アンケートの回答は無効**”}

{Note to AMS – Please present this “Caution!” and “For the people who is using car loan now” as a king of agreement require the subject to check a box for “I agree” before they can proceed to the next question.}

Consideration

検討の可能性

Q1. From the list of providers below, which provider would you consider as a possible provider for a card loan?

次の中で検討する可能性があるカードローンをお選びください。

1. Rakuten
1 . 楽天クレジット
2. Orix
2 . オリックス
3. Orico
3 . オリコ
4. JCB
4 . JCB
5. Mitsubishi Tokyo UFJ Bank
5 . 三菱東京 UFJ 銀行
6. Mitsui Sumitomo Bank
6 . 三井住友銀行
7. Mizuho Bank
7 . みずほ銀行
8. Resona Bank
8 . りそな銀行
9. Suruga Bank
9 . スルガ銀行
10. Japan net Bank
10 . ジャパンネット銀行
11. Cyuo Mitsui Trust Bank
11 . 中央三井信託銀行
12. Sumitomo Trust Bank
12 . 住友信託銀行
13. Lake
13 . レイク
14. Promise
14 . プロミス
15. Acom

- 15. アコム
- 16. Aiful
- 16. アイフル
- 17. Dic
- 17. ディック
- 18. Shinki
- 18. シンキ
- 19. Takefuji
- 19. 武富士
- 20. Mobit
- 20. モビット
- 21. @Loan
- 21. アットローン
- 22. Cash One
- 22. キャッシュ・ワン
- 23. Other _____
- 23. その他 _____

[If they choose more than 5 providers in Q1]

Q1a. You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?

あなたはカードローンを検討する可能性のある会社として、_____を答えましたが、そのうち上位5社をあげてください。

CHOOSE FIVE

5つの会社を選んで下さい。

- 1. Rakuten
- 1. 楽天クレジット
- 2. Orix
- 2. オリックス
- 3. Orico
- 3. オリコ
- 4. JCB
- 4. JCB
- 5. Mitsubishi Tokyo UFJ Bank
- 5. 三菱東京UFJ銀行
- 6. Mitsui Sumitomo Bank
- 6. 三井住友銀行

- 7. Mizuho Bank
7 . みずほ銀行
- 8. Resona Bank
8 . りそな銀行
- 9. Suruga Bank
9 . スルガ銀行
- 10. Japan net Bank
10 . ジャパンネット銀行
- 11. Cyuo Mitsui Trust Bank
11 . 中央三井信託銀行
- 12. Sumitomo Trust Bank
12 . 住友信託銀行
- 13. Lake
13 . レイク
- 14. Promise
14 . プロミス
- 15. Acom
15 . アコム
- 16. Aiful
16 . アイフル
- 17. Dic
17 . ディック
- 18. Shinki
18 . シンキ
- 19. Takefuji
19 . 武富士
- 20. Mobit
20 . モビット
- 21. @Loan
21 . アットローン
- 22. Cash One
22 . キャッシュ・ワン
- 23. Other _____
23 . その他_____

Opinion

ご意見

Q2. Now we would like to understand your opinion of providers that you have indicated you would consider.

Q2 . あなたが「検討する可能性がある」と答えた会社に関するご意見をお伺いいたします。

You will be presented with the list of providers you have chosen and a statement that may or may not describe these providers. Please read each statement and using the scale below as a guide, tell us if you agree or disagree with the statement as it pertains to the providers listed.

以下にお選びになった会社と、その会社に関する項目があります。それぞれの項目ごとに、各々の会社がどの程度あてはまるかを以下の5段階評価でお答え下さい。

- 1- Strongly Disagree
 - 1 . 全くそう思わない
- 2- Disagree
 - 2 . そう思わない
- 3- Neutral (Neither Disagree nor Agree)
 - 3 . どちらとも言えない
- 4- Agree
 - 4 . そう思う
- 5- Strongly Agree
 - 5 . とてもそう思う

{Note to AMS: This section includes each of the providers that the respondent has chosen in the consideration question. If the respondent chose more than 5 providers in consideration question 1 above, we may need to prompt them to give the top 5 providers they would consider. List the provider selected and then the 5-point agree-disagree scale. Repeat for each of the providers selected}

	Strongly Disagree 全くそ う思わ ない				Strongly Agree とても そう思 う
1. Overall, I trust the provider 1 . 全般的に、この会社を信頼している (信頼感)	1	2	3	4	5
2. The provider offers service at a better values 2 . この会社はより価値のあるサービスを 提供している (価値)	1	2	3	4	5
3. The provider offers more flexibility in loan screening 3 . この会社はより柔軟に対応してくれる ローンを提供している (審査の手軽さ)	1	2	3	4	5

4. The provider offers speedier in loan screening.	1	2	3	4	5
4 . この会社はよりスピーディーなローンを提供している (スピード)					
5. The provider offers better interest rate.	1	2	3	4	5
5 . この会社は魅力的な金利を提供している (金利)					
6. The provider is open, honest, and transparent	1	2	3	4	5
6 . この会社はオープンかつ公正で、透明性が高い (フェア)					
7. The provider is willing to assist and support me.	1	2	3	4	5
7 . この会社は積極的な顧客サポートを提供している (カスタマーサービス)					
8. I would recommend this provider to a friend.	1	2	3	4	5
8 . 私はこの会社を友人に紹介したい					

Preference Rating of Providers Considered

ローン会社に対する選好度合い

Q3. Please rank the providers you have selected in order of your preference for your card loan. Assume you have been given 100 chips. Please allocate the chips among the providers you have chosen in terms of order of preference. Allocate more points to the providers that you are more likely to obtain a card loan from and fewer points to the providers less likely to obtain a card loan. Please be sure to enter values that sum to 100.

あなたが選んだカードローン会社を、好みの順でランク付けして下さい。持ち点 100 を持っているとして、この持ち点をあなたが選んだ会社により好みに応じて配分して下さい。あなたがローンを利用する可能性が高い会社には、可能性が低い会社よりも多くの持ち点を配分して下さい。配分した持ち点の合計は、必ず 100 になるようにして下さい。

{Note to AMS -- Site should be able to show the providers provided here and a space next to the plans for entering chip amount. Survey should also be able to tell respondent how many chips are left each time an amount is input. This is a typical constant sum preference task}

Purchase Intentions/Likelihood of Purchase

実際の利用に対する可能性・意向

Q4. Now we would like to understand how likely you are to acquire a card loan from each provider in which you have indicated an interest.

Q4 . あなたが選んだそれぞれの会社で、カードローンを実際に利用する可能性はどの程度ありますか。

For each provider, please rate on a scale of 0-10 your likelihood of acquiring a card loan in the next 5 years.

10	Certain, Practically certain (99 chances out of 100)
10	ほぼ 100%の利用可能性
9	Almost sure (9 chances out of 10)
9	90%の利用可能性
8	Very probable (8 chances out of 10)
8	80%の利用可能性
7	Probable (7 chances out of 10)
7	70%の利用可能性
6	Good Possibility (6 chances out of 10)
6	60%の利用可能性
5	Fairly good possibility (5 chances out of 10)
5	50%の利用可能性
4	Fair possibility (4 chances out of 10)
4	40%の利用可能性
3	Some possibility (3 chances out of 10)
3	30%の利用可能性
2	Slight possibility (2 chances out of 10)
2	20%の利用可能性
1	Very slight possibility (1 chance out of 10)
1	10%の利用可能性
0	No chance, almost no chance (0 out of 100)
0	可能性ゼロ

{Note to AMS: List providers that respondent selected and the 11 point scale for each plan}

SECTION 3: Experiencing the Website

セクション3 サイトの利用体験

Now we would like you to experience a Website, which has information about loans in order to help you make the best decision for you. Please act as if you are looking to acquire a provider loan. If you already have a card loan, go to the site and browse the site as you would if you were switching to another card loan provider.

ここであなたが最適のカードローンを選ぶ手助けをするサイトを見ていただきます。あなたがカードローンを実際に利用するつもりになっていただいて、このサイトをご覧ください。もしあなたが既にカードローンをご利用されている場合は、カードローンの借り換えを検討されるつもりでこのサイトをご覧ください。

Click on the below URL to access the Website.

以下の URL をクリックして下さい。

Caution!

Please browse the site enough and carefully in order to have a meaningful answer for the survey. Otherwise (if we make a judgment that you don't have enough experience), you may **not be eligible for the survey**. We are taking a record of your visit history. We will ask some questions about the site after the site experience.

注意!

アンケートに意味のある回答ができるよう、十分に、注意深くサイトを見て下さい。閲覧の履歴は記録されています。この後でサイトに関するいくつかの質問があります。サイトを十分に閲覧していないと判断される場合は**アンケートの回答は無効**になることがありますので、ご注意ください。

{Note to AMS – Use red bold font for “**アンケートの回答は無効**”}

SECTION 4: Site Evaluation (Navigation, Ease of Use, Advice, Etc)

セクション3 サイトの評価 (ナビゲーション、使いやすさ、アドバイスなど)

Q5. For each statement below, please indicate the number that best indicates your level of agreement.

以下のサイトに関する評価項目について、どの程度そう思われるかを“1：全くそう思わない”～“5：とてもそう思う”の5段階評価でもっとも当てはまる番号をお教えてください。

Site Characteristics: Navigation/Ease of Use etc

Strongly
Disagree

Strongly
Agree

	全くそ 思わない				とても そう思 う
1 The site is easy to use. 1 . このサイトは利用しやすい	1	2	3	4	5
2. The site provides accurate and relevant information. 2 . このサイトは正確で適切な情報を提供している	1	2	3	4	5
3. The site provides me with sufficient information to make a decision on all card loans being offered. 3 . このサイトはすべてのカードローンの中から選択するうえで十分な情報を提供している	1	2	3	4	5
4. The site has useful support tools (such as a calculator or planner). 4 . このサイトには、計算ツールやプランナーなど役に立つツールがある。	1	2	3	4	5
5. Card loan offerings can easily be compared. 5 . 結果画面に表示された各カードローンは簡単に比較できる	1	2	3	4	5
6. The site is helpful to me in reaching my acquisition decisions. 6 . このサイトはカードローンを選ぶ決定をする上で役にたつ	1	2	3	4	5
7. I enjoyed the overall experience of the site. 7 . 全体としてこのサイトを満足して利用できた	1	2	3	4	5
8. This site appears to be more trustworthy than other sites I have visited. 8 . このサイトは、これまで見たほかのサイトよりも信頼感がある	1	2	3	4	5
9. I would acquire a card loan at this site. 9 . このサイトでカードローンを申し込みたい	1	2	3	4	5
10. I would recommend this site to a friend.	1	2	3	4	5

10. このサイトを友人に紹介したい

11. I would book mark this site. 1 2 3 4 5

11. このサイトを「お気に入り」に追加したい

12. The advisor on this site asked me too many questions. 1 2 3 4 5

このアドバイザーサイトの質問数は多すぎた

13. To recommend more suitable loan packages, I would be willing to answer more questions. 1 2 3 4 5

より最適なローンを薦めてもらうために、質問数はもっと多くてもよい

14. The content was written in a way that I found very appealing. 1 2 3 4 5

このコンテンツは読み手に訴えかけるように作られている。

15. The information and content was presented in a way that I am most comfortable with. 1 2 3 4 5

この情報やコンテンツは、私にとって見やすく作られていた。

SECTION 5: Post-Survey

Post Site Visit: Consideration, Opinion and Acquisition Intentions

Post Visit Consideration

サイト体験後の検討の可能性

Q6. Assuming that Orix brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?

Q6. このサイトがオリックスによって提供されていたと仮定します。カードローンを検討する可能性があった会社を次のリストよりいくつでもお選びください。(複数回答可)

1. Rakuten

1. 楽天クレジット

2. Orix

2. オリックス
3. Orico
3. オリコ
4. JCB
4. JCB
5. Mitsubishi Tokyo UFJ Bank
5. 三菱東京 UFJ 銀行
6. Mitsui Sumitomo Bank
6. 三井住友銀行
7. Mizuho Bank
7. みずほ銀行
8. Resona Bank
8. りそな銀行
9. Suruga Bank
9. スルガ銀行
10. Japan net Bank
10. ジャパンネット銀行
11. Cyuo Mitsui Trust Bank
11. 中央三井信託銀行
12. Sumitomo Trust Bank
12. 住友信託銀行
13. Lake
13. レイク
14. Promise
14. プロミス
15. Acom
15. アコム
16. Aiful
16. アイフル
17. Dic
17. ディック
18. Shinki
18. シンキ
19. Takefuji
19. 武富士
20. Mobit
20. モビット
21. @Loan
21. アットローン
22. Cash One

22. キャッシュ・ワン

23. Other _____

23. その他 _____

[If they choose more than 5 providers in Q6]

Q6a. You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?

あなたはカードローンを検討する可能性のある会社として、_____ を挙げられましたが、そのうち上位5社をあげてください。

CHOOSE FIVE

5つの会社を選んで下さい。

1. Rakuten
1. 楽天クレジット
2. Orix
2. オリックス
3. Orico
3. オリコ
4. JCB
4. JCB
5. Mitsubishi Tokyo UFJ Bank
5. 三菱東京 UFJ 銀行
6. Mitsui Sumitomo Bank
6. 三井住友銀行
7. Mizuho Bank
7. みずほ銀行
8. Resona Bank
8. りそな銀行
9. Suruga Bank
9. スルガ銀行
10. Japan net Bank
10. ジャパンネット銀行
11. Cyuo Mitsui Trust Bank
11. 中央三井信託銀行
12. Sumitomo Trust Bank
12. 住友信託銀行
13. Lake
13. レイク

- 14. Promise
14 . プロミス
- 15. Acom
15 . アコム
- 16. Aiful
16 . アイフル
- 17. Dic
17 . ディック
- 18. Shinki
18 . シンキ
- 19. Takefuji
19 . 武富士
- 20. Mobit
20 . モビット
- 21. @Loan
21 . アットローン
- 22. Cash One
22 . キャッシュ・ワン
- 23. Other _____
23 . その他_____

Post Visit Opinion

サイト体験後の意見

Q7. Now we would like to understand your opinion of Orix after visiting the website.

Q7 . このサイトがオリックスによって提供されていると仮定して、オリックスについてご意見をお伺いいたします。

You will be presented with a statement that may or may not describe Orix. Please read each statement and using the scale below as a guide, tell us if you agree or disagree with the statement as it pertains to Orix.

以下にオリックスについての評価項目がございます。それぞれの項目をお読みになって、オリックスがどの程度あてはまるかについて“1：全くそう思わない”～“5：とてもそう思う”の5段階評価で、もっとも当てはまる番号をお教えてください。

- 1.Strongly Disagree
1 . 全くそう思わない
- 2.Disagree

- 2 . そう思わない
- 3.Neutral (Neither Disagree nor Agree)
- 3 . どちらとも言えない
- 4.Agree
- 4 . そう思う
- 5.Strongly Agree
- 5 . とても思う

	Strongly Disagree 全くそ う思わ ない				Strongly Agree とても 思う
1. Overall, I trust Orix 1 . 全般的に、オリックスを信頼している (信頼感)	1	2	3	4	5
2. Orix offers service at a better values 2 . オリックスより価値のあるサービスを 提供している (価値)	1	2	3	4	5
3. Orix offers more flexibility in loan screening 3 . オリックスはより柔軟に対応してくれ るローンを提供している (審査の手軽さ)	1	2	3	4	5
4. Orix offers speedier in loan screening. 4 . オリックスはよりスピーディーなロー ンを提供している (スピード)	1	2	3	4	5
5. Orix offers better interest rate. 5 . オリックスは低金利を提供している。	1	2	3	4	5
6. Orix is open, honest, and transparent 6 . オリックスはオープンかつ公正で、透 明性が高い (資質)	1	2	3	4	5
7. Orix is willing to assist and support me. 7 . オリックスは積極的な顧客サポートを 提供している	1	2	3	4	5
8. I would recommend Orix to a friend. 8 . 私はオリックスを友人に紹介したい	1	2	3	4	5

Post Visit Rating of Providers Considered

Q8. Please rank the providers you have selected in Q6 in order of your preference for your card loan. Assume you have been given 100 chips. Please allocate the chips among the providers you have chosen in terms of order of preference. Allocate more points to the providers that you are more likely to obtain a card loan from and fewer points to the providers less likely to obtain a card loan. Please be sure to enter values that sum to 100.

あなたが選んだカードローン会社を、好みの順でランク付けして下さい。持ち点 100 を持っているとして、この持ち点をあなたが選んだ会社に好みに応じて配分して下さい。あなたがローンを利用する可能性が高い会社には、可能性が低い会社よりも多くの持ち点を配分して下さい。配分した持ち点の合計は、必ず 100 になるようにして下さい。

{Note to AMS -- Site should be able to show the providers provided here and a space next to the plans for entering chip amount. Survey should also be able to tell respondent how many chips are left each time an amount is input. This is a typical constant sum preference task}

Post Visit Intentions/Likelihood of Purchase from Providers that Brought you the Website サイト体験後の実際の利用の可能性・意向

Q9. We are interested in your chances of acquiring a card loan from Orix given the information provided in the Website you have just viewed. On the following scale, how probable is it that you would acquire a card loan package that you have learned about on the site?

Q9 . 実際にオリックスでカードローンを利用する可能性はどの程度ございますか。

Please rate on a scale of 0-10 your likelihood of acquiring a card loan from Orix.
オリックスで実際にカードローンを利用する可能性をつぎの 10 段階でご評価下さい。

10	Certain, Practically certain (99 chances out of 100)
10	ほぼ 100% の利用可能性
9	Almost sure (9 chances out of 10)
9	90% の利用可能性
8	Very probable (8 chances out of 10)
8	80% の利用可能性
7	Probable (7 chances out of 10)
7	70% の利用可能性
6	Good Possibility (6 chances out of 10)
6	60% の利用可能性
5	Fairly good possibility (5 chances out of 10)

5	50%の利用可能性
4	Fair possibility (4 chances out of 10)
4	40%の利用可能性
3	Some possibility (3 chances out of 10)
3	30%の利用可能性
2	Slight possibility (2 chances out of 10)
2	20%の利用可能性
1	Very slight possibility (1 chance out of 10)
1	10%の利用可能性
0	No chance, almost no chance (0 out of 100)
0	可能性ゼロ

(Now for Suruga)

Q6. Assuming that Suruga bank brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?

Q6.このサイトがスルガ銀行によって提供されていたと仮定します。カードローンを検討する可能性があった会社を次のリストよりいくつでもお選びください。(複数回答可)

1. Rakuten
1 . 楽天クレジット
2. Orix
2 . オリックス
3. Orico
3 . オリコ
4. JCB
4 . JCB
5. Mitsubishi Tokyo UFJ Bank
5 . 三菱東京 UFJ 銀行
6. Mitsui Sumitomo Bank
6 . 三井住友銀行
7. Mizuho Bank
7 . みずほ銀行
8. Resona Bank
8 . りそな銀行
9. Suruga Bank
9 . スルガ銀行
10. Japan net Bank
10 . ジャパンネット銀行

- 11. Cyuo Mitsui Trust Bank
1 1 . 中央三井信託銀行
- 12. Sumitomo Trust Bank
1 2 . 住友信託銀行
- 13. Lake
1 3 . レイク
- 14. Promise
1 4 . プロミス
- 15. Acom
1 5 . アコム
- 16. Aiful
1 6 . アイフル
- 17. Dic
1 7 . ディック
- 18. Shinki
1 8 . シンキ
- 19. Takefuji
1 9 . 武富士
- 20. Mobit
2 0 . モビット
- 21. @Loan
2 1 . アットローン
- 22. Cash One
2 2 . キャッシュ・ワン
- 23. Other _____
2 3 . その他 _____

[If they choose more than 5 providers in Q6]

Q6a. You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?

あなたはカードローンを検討する可能性のある会社として、_____を挙げられましたが、そのうち上位5社をあげてください。

CHOOSE FIVE

5つの会社を選んで下さい。

- 1. Rakuten
1 . 楽天クレジット
- 2. Orix

2. オリックス
3. Orico
3. オリコ
4. JCB
4. JCB
5. Mitsubishi Tokyo UFJ Bank
5. 三菱東京 UFJ 銀行
6. Mitsui Sumitomo Bank
6. 三井住友銀行
7. Mizuho Bank
7. みずほ銀行
8. Resona Bank
8. りそな銀行
9. Suruga Bank
9. スルガ銀行
10. Japan net Bank
10. ジャパンネット銀行
11. Cyuo Mitsui Trust Bank
11. 中央三井信託銀行
12. Sumitomo Trust Bank
12. 住友信託銀行
13. Lake
13. レイク
14. Promise
14. プロミス
15. Acom
15. アコム
16. Aiful
16. アイフル
17. Dic
17. ディック
18. Shinki
18. シンキ
19. Takefuji
19. 武富士
20. Mobit
20. モビット
21. @Loan
21. アットローン
22. Cash One

22. キャッシュ・ワン

23. Other _____

23. その他 _____

Post Visit Opinion

サイト体験後の意見

Q7. Now we would like to understand your opinion of Suruga bank after visiting the website.

Q7. このサイトがスルガ銀行によって提供されていると仮定して、スルガ銀行についてご意見をお伺いいたします。

You will be presented with a statement that may or may not describe Suruga bank. Please read each statement and using the scale below as a guide, tell us if you agree or disagree with the statement as it pertains to Suruga bank.

以下にスルガ銀行についての評価項目がございます。それぞれの項目をお読みになって、スルガ銀行がどの程度あてはまるかについて“1：全くそう思わない”～“5：とてもそう思う”の5段階評価で、もっとも当てはまる番号をお教えてください。

1.Strongly Disagree

1 . 全くそう思わない

2.Disagree

2 . そう思わない

3.Neutral (Neither Disagree nor Agree)

3 . どちらとも言えない

4.Agree

4 . そう思う

5.Strongly Agree

5 . とてもそう思う

Strongly
Disagree
e
全くそ
う思わ
ない

Strongly
Agree
とても
そう思
う

1. Overall, I trust Suruga bank

1

2

3

4

5

1. 全般的に、スルガ銀行を信頼している (信頼感)					
2. Suruga bank offers service at a better values 2. スルガ銀行はより価値のあるサービスを提供している(価値)	1	2	3	4	5
3. Suruga bank offers more flexibility in loan screening 3. スルガ銀行はより柔軟に対応してくれるローンを提供している(審査の手軽さ)	1	2	3	4	5
4. Suruga bank offers speedier in loan screening. 4. スルガ銀行はよりスピーディーなローンを提供している(スピード)	1	2	3	4	5
5. Suruga bank offers better interest rate. 5. スルガ銀行は低金利を提供している。	1	2	3	4	5
6. Suruga bank is open, honest, and transparent 6. スルガ銀行はオープンかつ公正で、透明性が高い(資質)	1	2	3	4	5
7. Suruga bank is willing to assist and support me. 7. スルガ銀行は積極的な顧客サポートを提供している	1	2	3	4	5
8. I would recommend Suruga bank to a friend. 8. 私はスルガ銀行を友人に紹介したい	1	2	3	4	5

Post Visit Rating of Providers Considered

Q8. Please rank the providers you have selected in Q6 in order of your preference for your card loan. Assume you have been given 100 chips. Please allocate the chips among the providers you have chosen in terms of order of preference. Allocate more points to the providers that you are more likely to obtain a card loan from and fewer points to the providers less likely to obtain a card loan. Please be sure to enter values that sum to 100.

あなたが選んだカードローン会社を、好みの順でランク付けして下さい。持ち点 100 を持っているとして、この持ち点をあなたが選んだ会社好みに応じて配分してください。あなたがローン

を利用する可能性が高い会社には、可能性が低い会社よりも多くの持ち点を配分して下さい。配分した持ち点の合計は、必ず 100 になるようにして下さい。

{Note to AMS -- Site should be able to show the providers provided here and a space next to the plans for entering chip amount. Survey should also be able to tell respondent how many chips are left each time an amount is input. This is a typical constant sum preference task}

Post Visit Intentions/Likelihood of Purchase from Providers that Brought you the Website
サイト体験後の実際の利用の可能性・意向

Q9. We are interested in your chances of acquiring a card loan from Suruga bank given the information provided in the Website you have just viewed. On the following scale, how probable is it that you would acquire a card loan package that you have learned about on the site?

Q9 . 実際にスルガ銀行でカードローンを利用する可能性はどの程度ございますか。

Please rate on a scale of 0-10 your likelihood of acquiring a card loan from Suruga bank.
スルガ銀行で実際にカードローンを利用する可能性をつぎの 10 段階でご評価下さい。

- | | |
|----|--|
| 10 | Certain, Practically certain (99 chances out of 100) |
| 10 | ほぼ 100%の利用可能性 |
| 9 | Almost sure (9 chances out of 10) |
| 9 | 90%の利用可能性 |
| 8 | Very probable (8 chances out of 10) |
| 8 | 80%の利用可能性 |
| 7 | Probable (7 chances out of 10) |
| 7 | 70%の利用可能性 |
| 6 | Good Possibility (6 chances out of 10) |
| 6 | 60%の利用可能性 |
| 5 | Fairly good possibility (5 chances out of 10) |
| 5 | 50%の利用可能性 |
| 4 | Fair possibility (4 chances out of 10) |
| 4 | 40%の利用可能性 |
| 3 | Some possibility (3 chances out of 10) |
| 3 | 30%の利用可能性 |
| 2 | Slight possibility (2 chances out of 10) |
| 2 | 20%の利用可能性 |
| 1 | Very slight possibility (1 chance out of 10) |

- 1 10%の利用可能性
0 No chance, almost no chance (0 out of 100)
0 可能性ゼロ

(Now for Acom)

Q6. Assuming that Acom brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?

Q6.このサイトがアコムによって提供されていたと仮定します。カードローンを検討する可能性があった会社を次のリストよりいくつでもお選びください。(複数回答可)

1. Rakuten
1 . 楽天クレジット
2. Orix
2 . オリックス
3. Orico
3 . オリコ
4. JCB
4 . JCB
5. Mitsubishi Tokyo UFJ Bank
5 . 三菱東京 UFJ 銀行
6. Mitsui Sumitomo Bank
6 . 三井住友銀行
7. Mizuho Bank
7 . みずほ銀行
8. Resona Bank
8 . りそな銀行
9. Suruga Bank
9 . スルガ銀行
10. Japan net Bank
10 . ジャパンネット銀行
11. Cyuo Mitsui Trust Bank
11 . 中央三井信託銀行
12. Sumitomo Trust Bank
12 . 住友信託銀行
13. Lake
13 . レイク
14. Promise
14 . プロミス
15. Acom

- 15. アコム
- 16. Aiful
- 16. アイフル
- 17. Dic
- 17. ディック
- 18. Shinki
- 18. シンキ
- 19. Takefuji
- 19. 武富士
- 20. Mobit
- 20. モビット
- 21. @Loan
- 21. アットローン
- 22. Cash One
- 22. キャッシュ・ワン
- 23. Other _____
- 23. その他 _____

[If they choose more than 5 providers in Q6]

Q6a. You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?

あなたはカードローンを検討する可能性のある会社として、_____ を挙げられましたが、そのうち上位5社をあげてください。

CHOOSE FIVE

5つの会社を選んで下さい。

- 1. Rakuten
- 1. 楽天クレジット
- 2. Orix
- 2. オリックス
- 3. Orico
- 3. オリコ
- 4. JCB
- 4. JCB
- 5. Mitsubishi Tokyo UFJ Bank
- 5. 三菱東京UFJ銀行
- 6. Mitsui Sumitomo Bank
- 6. 三井住友銀行

7. Mizuho Bank
7 . みずほ銀行
8. Resona Bank
8 . りそな銀行
9. Suruga Bank
9 . スルガ銀行
10. Japan net Bank
10 . ジャパンネット銀行
11. Cyuo Mitsui Trust Bank
11 . 中央三井信託銀行
12. Sumitomo Trust Bank
12 . 住友信託銀行
13. Lake
13 . レイク
14. Promise
14 . プロミス
15. Acom
15 . アコム
16. Aiful
16 . アイフル
17. Dic
17 . ディック
18. Shinki
18 . シンキ
19. Takefuji
19 . 武富士
20. Mobit
20 . モビット
21. @Loan
21 . アットローン
22. Cash One
22 . キャッシュ・ワン
23. Other _____
23 . その他_____

Post Visit Opinion
サイト体験後の意見

Q7. Now we would like to understand your opinion of Acom after visiting the website.

Q7. このサイトがアコムによって提供されていると仮定して、アコムについてご意見をお伺いいたします。

You will be presented with a statement that may or may not describe Acom. Please read each statement and using the scale below as a guide, tell us if you agree or disagree with the statement as it pertains to Acom.

以下にアコムについての評価項目がございます。それぞれの項目をお読みになって、アコムがどの程度あてはまるかについて“1：全くそう思わない”～“5：とてもそう思う”の5段階評価で、もっとも当てはまる番号をお教えてください。

- 1.Strongly Disagree
1. 全くそう思わない
- 2.Disagree
2. そう思わない
- 3.Neutral (Neither Disagree nor Agree)
3. どちらとも言えない
- 4.Agree
4. そう思う
- 5.Strongly Agree
5. とてもそう思う

	Strongly Disagree 全くそう思わない	2	3	4	Strongly Agree とてもそう思う
1. Overall, I trust Acom 1. 全般的に、アコムを信頼している (信頼感)	1	2	3	4	5
2. Acom offers service at a better values 2. アコムはより価値のあるサービスを提供している (価値)	1	2	3	4	5
3. Acom offers more flexibility in loan screening 3. アコムはより柔軟に対応してくれる	1	2	3	4	5

ーンを提供している (審査の手軽さ)					
4. Acom offers speedier in loan screening. 4 . アコムはよりスピーディーなローンを提供している (スピード)	1	2	3	4	5
5. Acom offers better interest rate. 5 . アコムは低金利を提供している。	1	2	3	4	5
6. Acom is open, honest, and transparent 6 . アコムはオープンかつ公正で、透明性が高い (資質)	1	2	3	4	5
7. Acom is willing to assist and support me. 7 . アコムは積極的な顧客サポートを提供している	1	2	3	4	5
8. I would recommend this Acom to a friend. 8 . 私はアコムを友人に紹介したい	1	2	3	4	5

Post Visit Rating of Providers Considered

Q8. Please rank the providers you have selected in Q6 in order of your preference for your card loan. Assume you have been given 100 chips. Please allocate the chips among the providers you have chosen in terms of order of preference. Allocate more points to the providers that you are more likely to obtain a card loan from and fewer points to the providers less likely to obtain a card loan. Please be sure to enter values that sum to 100.

あなたが選んだカードローン会社を、好みの順でランク付けして下さい。持ち点 100 を持っているとして、この持ち点をあなたが選んだ会社により好みに応じて配分して下さい。あなたがローンを利用する可能性が高い会社には、可能性が低い会社よりも多くの持ち点を配分して下さい。配分した持ち点の合計は、必ず 100 になるようにして下さい。

{Note to AMS -- Site should be able to show the providers provided here and a space next to the plans for entering chip amount. Survey should also be able to tell respondent how many chips are left each time an amount is input. This is a typical constant sum preference task}

Post Visit Intentions/Likelihood of Purchase from Providers that Brought you the Website サイト体験後の実際の利用の可能性・意向

Q9. We are interested in your chances of acquiring a card loan from Acom given the information provided in the Website you have just viewed. On the following scale, how probable is it that you would acquire a card loan package that you have learned about on the site?

Q9 . 実際にアコムでカードローンを利用する可能性はどの程度ございますか。

Please rate on a scale of 0-10 your likelihood of acquiring a card loan from Acom.

アコムで実際にカードローンを利用する可能性をつぎの 10 段階でご評価下さい。

10	Certain, Practically certain (99 chances out of 100)
10	ほぼ 100%の利用可能性
9	Almost sure (9 chances out of 10)
9	90%の利用可能性
8	Very probable (8 chances out of 10)
8	80%の利用可能性
7	Probable (7 chances out of 10)
7	70%の利用可能性
6	Good Possibility (6 chances out of 10)
6	60%の利用可能性
5	Fairly good possibility (5 chances out of 10)
5	50%の利用可能性
4	Fair possibility (4 chances out of 10)
4	40%の利用可能性
3	Some possibility (3 chances out of 10)
3	30%の利用可能性
2	Slight possibility (2 chances out of 10)
2	20%の利用可能性
1	Very slight possibility (1 chance out of 10)
1	10%の利用可能性
0	No chance, almost no chance (0 out of 100)
0	可能性ゼロ

SECTION 6: Consumer Characteristics and Demographics

We are interested in learning more about your cognitive and cultural style. You will be presented with a list of statements that may or may not describe you. Please read each statement and using the scale below as a guide, tell us if you agree or disagree with the statements as it pertains to you.

ご覧になったカードローンのサイトは、閲覧者個人の認知スタイルと文化的信条という2つの側面を元に変化するように作られています。あなたのこれらの側面を知るために、以下の質問にお答えください。

あなたのスタイルや考え方に関してお聞きする記述がありますので、それぞれの記述を読んで、どれくらい当てはまるかを答えて下さい

<p>I'm usually afraid to express disagreement with my superiors or with important persons (H = Hierarchical, E = Egalitarian)</p>	<p><input type="radio"/> Strongly agree (+2 H) <input type="radio"/> Agree (+1 H) <input type="radio"/> Undecided (0) <input type="radio"/> Disagree (+1 E) <input type="radio"/> Strongly disagree (+2 E)</p>
<p>上司や重要な人物の意見に反対することを、よくためらう。</p>	<p><input type="radio"/> とてもそう思う <input type="radio"/> そう思う <input type="radio"/> どちらとも言えない <input type="radio"/> そう思わない <input type="radio"/> 全くそう思わない</p>
<p>I prefer planning before acting (D = Deliberative, I = Impulsive)</p>	<p><input type="radio"/> Strongly agree (+2 D) <input type="radio"/> Agree (+1 D) <input type="radio"/> Undecided (0) <input type="radio"/> Disagree (+1 I) <input type="radio"/> Strongly disagree (+2 I)</p>
<p>行動を起こす前に計画を立てるほうだ。</p>	<p><input type="radio"/> とてもそう思う <input type="radio"/> そう思う <input type="radio"/> どちらとも言えない <input type="radio"/> そう思わない <input type="radio"/> 全くそう思わない</p>
<p>In choosing my ideal job it would be very important to have sufficient time for my personal life (I = Individualism, C = Collectivism)</p>	<p><input type="radio"/> Strongly agree (+2 I) <input type="radio"/> Agree (+1 I) <input type="radio"/> Undecided (0) <input type="radio"/> Disagree (+1 C) <input type="radio"/> Strongly disagree (+2 C)</p>
<p>理想的な仕事を選ぶ上で、自分の時間が十分にとれるということは非常に重要だ。</p>	<p><input type="radio"/> とてもそう思う <input type="radio"/> そう思う <input type="radio"/> どちらとも言えない <input type="radio"/> そう思わない <input type="radio"/> 全くそう思わない</p>
<p>I see what I read in mental pictures (A= Analytic/Visual, H= Holistic/Verbal)</p>	<p><input type="radio"/> Strongly agree (+2 A) <input type="radio"/> Agree (+1 A) <input type="radio"/> Undecided (0)</p>

	<input type="radio"/> Disagree (+1 H) <input type="radio"/> Strongly disagree (+2 H)
<p>文章で読んだ光景を、頭の中に思い描くことができる。</p>	<input type="radio"/> とてもそう思う <input type="radio"/> そう思う <input type="radio"/> どちらとも言えない <input type="radio"/> そう思わない <input type="radio"/> 全くそう思わない
<p>I buy products in order to differentiate myself from other people (I = Individualism, C = Collectivism)</p>	<input type="radio"/> Strongly agree (+2 I) <input type="radio"/> Agree (+1 I) <input type="radio"/> Undecided (0) <input type="radio"/> Disagree (+1 C) <input type="radio"/> Strongly disagree (+2 C)
<p>物を買う時には、他の人との違いを出すようにしている。</p>	<input type="radio"/> とてもそう思う <input type="radio"/> そう思う <input type="radio"/> どちらとも言えない <input type="radio"/> そう思わない <input type="radio"/> 全くそう思わない
<p>Buying products for my family and friends is more important to me than buying things for myself (I = Individualism, C = Collectivism)</p>	<input type="radio"/> Strongly agree (+2 C) <input type="radio"/> Agree (+1 C) <input type="radio"/> Undecided (0) <input type="radio"/> Disagree (+1 I) <input type="radio"/> Strongly disagree (+2 I)
<p>家族や友人のために物を買うことは、自分自身のために買うことよりも大切だ。</p>	<input type="radio"/> とてもそう思う <input type="radio"/> そう思う <input type="radio"/> どちらとも言えない <input type="radio"/> そう思わない <input type="radio"/> 全くそう思わない
<p>I am detailed oriented, and start with the details in order to build a complete picture (A= Analytic/Visual, H= Holistic/Verbal)</p>	<input type="radio"/> Strongly agree (+2 A) <input type="radio"/> Agree (+1 A) <input type="radio"/> Undecided (0) <input type="radio"/> Disagree (+1 H) <input type="radio"/> Strongly disagree (+2 H)
<p>細部を重視するので、全体像を掴むためには、まず詳細な部分から入る。</p>	<input type="radio"/> とてもそう思う <input type="radio"/> そう思う <input type="radio"/> どちらとも言えない <input type="radio"/> そう思わない <input type="radio"/> 全くそう思わない
<p>I value mostly experts' opinions when I buy a product (H = Hierarchical, E = Egalitarian)</p>	<input type="radio"/> Strongly agree (+2 H) <input type="radio"/> Agree (+1 H) <input type="radio"/> Undecided (0) <input type="radio"/> Disagree (+1 E)

	<input type="radio"/> Strongly disagree (+2 E)
物を買う時には、主に専門家の意見を重視する。	<input type="radio"/> とてもそう思う <input type="radio"/> そう思う <input type="radio"/> どちらとも言えない <input type="radio"/> そう思わない <input type="radio"/> 全くそう思わない
I enjoy deciphering graphs, charts and diagrams about products and services (A = Analytic, H = Holistic)	<input type="radio"/> Strongly agree (+2 A) <input type="radio"/> Agree (+1 A) <input type="radio"/> Undecided (0) <input type="radio"/> Disagree (+1 H) <input type="radio"/> Strongly disagree (+2 H)
製品やサービスを、グラフや表やチャートで比較検討するのが好きだ。	<input type="radio"/> とてもそう思う <input type="radio"/> そう思う <input type="radio"/> どちらとも言えない <input type="radio"/> そう思わない <input type="radio"/> 全くそう思わない
I like detailed explanations (A = Analytic, H= Holistic)	<input type="radio"/> Strongly agree (+2 A) <input type="radio"/> Agree (+1 A) <input type="radio"/> Undecided (0) <input type="radio"/> Disagree (+1 H) <input type="radio"/> Strongly disagree (+2 H)
細かい説明が好きだ。	<input type="radio"/> とてもそう思う <input type="radio"/> そう思う <input type="radio"/> どちらとも言えない <input type="radio"/> そう思わない <input type="radio"/> 全くそう思わない
I'm usually more interested in parts and details than in the whole (A = Analytic, H = Holistic)	<input type="radio"/> Strongly agree (+2 A) <input type="radio"/> Agree (+1 A) <input type="radio"/> Undecided (0) <input type="radio"/> Disagree (+1 H) <input type="radio"/> Strongly disagree (+2 H)
物事の全体像よりも細部の方が気になる方だ。	<input type="radio"/> とてもそう思う <input type="radio"/> そう思う <input type="radio"/> どちらとも言えない <input type="radio"/> そう思わない <input type="radio"/> 全くそう思わない
I think authority and leadership are very important in my life (H = Hierarchical, E = Egalitarian)	<input type="radio"/> Strongly agree (+2 H) <input type="radio"/> Agree (+1 H)

	<input type="radio"/> Undecided (0) <input type="radio"/> Disagree (+1 E) <input type="radio"/> Strongly disagree (+2 E)
権威やリーダーシップは、自分にとって、とても重要だ。	<input type="radio"/> とてもそう思う <input type="radio"/> そう思う <input type="radio"/> どちらとも言えない <input type="radio"/> そう思わない <input type="radio"/> 全くそう思わない
I like to make purchases without thinking too much about the consequences (D = Deliberative, I = Impulsive)	<input type="radio"/> Strongly agree (+2 I) <input type="radio"/> Agree (+1 I) <input type="radio"/> Undecided (0) <input type="radio"/> Disagree (+1 D) <input type="radio"/> Strongly disagree (+2 D)
何かを買う時には、あとさきの結果を深く考えたくない。	<input type="radio"/> とてもそう思う <input type="radio"/> そう思う <input type="radio"/> どちらとも言えない <input type="radio"/> そう思わない <input type="radio"/> 全くそう思わない
I will read an explanation of a graphic/chart before I try to understand the graph/chart on my own	<input type="radio"/> Strongly agree (+2 A) <input type="radio"/> Agree (+1 A) <input type="radio"/> Undecided (0) <input type="radio"/> Disagree (+1 H) <input type="radio"/> Strongly disagree (+2 H)
グラフや表を見た時に、これらが何を意味するのかを自分で考える前に、説明を読む。	<input type="radio"/> とてもそう思う <input type="radio"/> そう思う <input type="radio"/> どちらとも言えない <input type="radio"/> そう思わない <input type="radio"/> 全くそう思わない

(Shane's Questions – Measures Deliberative vs. Impulsive)

1. A bat and a ball cost \$1.10 in total. The bat costs \$1.00 more than the ball. How much does the ball cost? [ENTER CENTS]
 Cents
2. If it takes 5 machines 5 minutes to produce 5 widgets, how long would it take 100 machines to produce 100 widgets? [ENTER MINUTES]
 minutes

3. In a lake, there is a patch of lily pads. Every day the patch doubles in size. If it takes 48 days for the patch to cover the lake, how long would it take for the patch to cover half of the lake? [ENTER DAYS]

_____ days

1. バットとボールは、合計で\$1.10です。バットはボールよりも\$1.00高いです。ボールはいくらでしょうか？ ()セント

2. ある5台の機械では、5分で5個の製品が作れます。同じ機械100台で100個の製品を作るには、何分かかりますか？ ()分

3. 池の中にスイレンがあります。このスイレンは毎日、倍の面積が増えて行きます。もし池を覆い尽くすのに48日かかるとすると、池の半分を覆い尽くすには何日かかりますか？ ()日

DEMOGRAPHICS

統計上の質問

DQ1: What is your gender?

1. Male
2. Female

あなたの性別は？

1. 男性
2. 女性

DQ2: What is your level of education?

1. High school graduate or less
2. Carrier College, Juni or College graduate
3. Undergraduate degree
4. Advanced degree

あなたの学歴は？

1. 高校卒、または下記以外
2. 専門学校、短大卒等
3. 大学卒

4 . 大学院卒以上

DQ3: Family and children

1. Unmarried
2. Married, no child
3. Married, with child(ren)

家族構成は？

- 1 . 未婚
- 2 . 既婚、子供なし
- 3 . 既婚、子供あり

SECTION 7: Site Survey

Open ended Questions related to the card loan Site

ご覧になったカードローンのサイトに関して、以下の質問に自由にお答えください。

O1. What did you think of this site?

このサイトに関して、どう思いましたか？

O2. What did you like most about the site?

このサイトで最も良かったところは何でしたか？

O3. What did you like least about the site?

このサイトで最も良くなかったところは何でしたか？

O4. What would you tell a friend about the site?

このサイトを友人に話すとしたら、どのように話しますか？

O5. Do you trust the site? And if not, what would be useful to build your trust for the site?

このサイトは信頼できましたか？もし信頼できなかった場合、他に何があれば信頼できるサイトになると思いますか？

長い時間、ご協力いただきまして誠にありがとうございました。

Introduction

カードローンに関する調査

アンケートにご協力いただきありがとうございます。このアンケートはカードローンに関して皆様のご意見を伺うことを目的としております。約25分から30分ほどお時間をいただきますが、何卒よろしくお願いいたします。

ご回答の際、それぞれの質問を良くお読み下さい。もし最適なお答えが見つからない場合は一番近いと思われるものをお選び下さい。いただいたご回答は厳重に管理され、調査目的以外の利用は決してございませんので安心してご回答いただきたいと存じます。

ご協力よろしくお願いいたします。

調査に答える準備ができたなら「次へ」のボタンをクリックしてください。

次へ

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SQ1.

カードローンに関する調査

あなたの年齢は？

 歳

次へ

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SQ2.

カードローンに関する調査

あなたはカードローンの口座を持っていますか？（使っているかどうかは関係なく、持っているかどうかをお答え下さい）
[回答は1つ]

- 以前持っていたが、今は持っていない（5年以上前）
- 以前持っていたが、今は持っていない（5年以内）
- 現在持っている
- 持ったことがない

次へ

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SQ3.

カードローンに関する調査

あなたはこれまでにカードローンを利用したことがありますか？
[回答は1つ]

- 以前利用していたが現在は利用していない（5年以上前）
- 以前利用していたが現在は利用していない（5年以内）
- 現在利用している
- 利用したことがない

次へ

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SQ4.

カードローンに関する調査

どのような種類のカードローンを持っていましたか？または持っていますか？当てはまるものすべてお答え下さい。
[あてはまるものすべてにチェックをしてください]

- 銀行系ローン
- 銀行と消費者金融の提携ローン（モビット、キャッシュワン、アットローンなど）
- 信販系ローン
- 消費者金融系ローン
- その他

次へ

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SQ5.

カードローンに関する調査

現在は何本の（何社の）カードローンを持っていますか？

次へ

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SQ6.

カードローンに関する調査

あなたは近いうちに、カードローンの利用を検討していますか？

[回答は1つ]

- はい
 いいえ

次へ

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Pre-survey introduction

カードローンに関する調査

それでは早速、本調査に入らせていただきます。全体の流れは以下の通りです。

カードローンに関する、現在の利用、検討の可能性、ご意見、好み、利用意向についてのご質問	約5分
別のサイトを閲覧	約10分
閲覧していただいたサイトに関する質問	約7分
統計上の質問	5分弱

注意！

アンケートに意味のある回答ができるよう、十分に、注意深くサイトを見て下さい。閲覧の履歴は記録されています。この後でサイトに関するいくつかの質問があります。サイトを十分に閲覧していないと判断される場合は **アンケートの回答は無効** になることがありますので、ご注意ください。

- 同意する

カードローンを、既にご利用中の方へ

現在、お借り入れのカードローンを借り換えるつもりでサイトを閲覧し、アンケートにご回答ください。

- 同意する

次へ

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Q1.

カードローンに関する調査

次の中で検討する可能性があるカードローンをお選びください。
[あてはまるものすべてにチェックをしてください]

- オリコ
- アイフル
- ティック
- JCB
- ジャパンネット銀行
- プロミス
- アットローン
- アコム
- モビット
- 三井住友銀行
- シンキ
- レイク
- 住友信託銀行
- 中央三井信託銀行
- みずほ銀行
- りそな銀行
- 農富士
- オリックス
- キャッシュ・ワン
- 三菱東京UFJ銀行
- 楽天クレジット
- スルガ銀行
- その他:

[次へ](#)

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Q1a.

カードローンに関する調査

あなたはカードローンを検討する可能性のある会社として、オリコ、JCB、ジャパンネット銀行、プロミス、アイフル、ティック。を答えましたが、そのうち上位5社をあげてください。
[回答は5つ]

- ジャパンネット銀行
- ティック
- オリコ
- アイフル
- プロミス
- JCB

[次へ](#)

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Q2. (Banks 1 – 5)

Top 5 choices
shown here
on separate
pages



カードローンに関する調査

あなたが「検討する可能性がある」と答えた会社に関するご意見を伺いいたします。

以下にの選びになった会社と、その会社に関する項目があります。それぞれの項目ごとに、各々の会社がどの程度あてはまるかを以下の5段階評価でお答え下さい。

1. とてもそう思う
2. そう思う
3. どちらとも言えない
4. そう思わない
5. 全くそう思わない

[回答はそれぞれの質問に1つずつ]

オリコ	とてもそう思う			全くそう思わない	
	1	2	3	4	5
この会社は魅力的な金利を提供している（金利）	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
この会社はより柔軟に対応してくれるローンを提供している（審査の手続き）	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
この会社はオープンかつ公正で、透明性が高い（フェア）	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
この会社は積極的な顧客サポートを提供している（カスタマーサービス）	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
この会社はよりスピーディーなローンを提供している（スピード）	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
この会社はより価値のあるサービスを提供している（価値）	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
私はこの会社を友人に紹介したい	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
全般的に、この会社を信頼している（信頼感）	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

次へ

Q3.

カードローンに関する調査

あなたが選んだカードローン会社を、好みの順でランク付けして下さい。持ち点100を持っているとして、この持ち点をあなたが選んだ会社に応じて配分して下さい。あなたがローンを利用する可能性が高い会社には、可能性が低い会社よりも多くの持ち点を配分して下さい。配分した持ち点の合計は、必ず100になるようにして下さい。

[合計で100になるように]

	持ち点
オリコ	<input style="width: 40px; height: 20px;" type="text"/>
ジャパンネット銀行	<input style="width: 40px; height: 20px;" type="text"/>
プロミス	<input style="width: 40px; height: 20px;" type="text"/>
アイフル	<input style="width: 40px; height: 20px;" type="text"/>
ディック	<input style="width: 40px; height: 20px;" type="text"/>
合計:	<input style="width: 40px; height: 20px; border: 1px solid black;" type="text" value="0"/>

次へ

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Q4.

カードローンに関する調査

あなたが選んだそれぞれの会社で、カードローンを実際に利用する可能性はどの程度ありますか。

- 10 ほぼ100%の利用可能性
- 9 90%の利用可能性
- 8 80%の利用可能性
- 7 70%の利用可能性
- 6 60%の利用可能性
- 5 50%の利用可能性
- 4 40%の利用可能性
- 3 30%の利用可能性
- 2 20%の利用可能性
- 1 10%の利用可能性
- 0 可能性ゼロ

[回答は1つずつ]

	10	9	8	7	6	5	4	3	2	1	0
オリコ	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ジャパンネット銀行	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
プロミス	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
アイフル	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ディック	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

次へ

Website Introduction

カードローンに関する調査

ここであなたが最適なカードローンを選ぶ手助けをするサイトを見ていただきます。あなたがカードローンを実際に利用するつもりになっていただいて、このサイトをご覧ください。もしあなたが既にカードローンをご利用されている場合は、カードローンの借り換えを検討されるつもりでこのサイトをご覧ください。

注意！

アンケートに意味のある回答ができるよう、十分に、注意深くサイトを見て下さい。閲覧の履歴は記録されています。この後でサイトに関するいくつかの質問があります。サイトを十分に閲覧していないと判断される場合は **アンケートの回答は無効** になることがありますので、ご注意ください。

次へ

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Filler Page

カードローンに関する調査

In real survey this is going to the MIT Site where users will explore.

Here is the URL that MIT will return the users to when they are done exploring:

<http://surveyplus.com/surveyms08/qreturn.asp?id=XXXXXXXX>

次へ

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Q5.

カードローンに関する調査

以下のサイトに関する評価項目について、どの程度そう思われるかを「1：とてもそう思う」～「5：全くそう思わない」の5段階評価でもっとも当てはまる番号をお教えください。

[回答はそれぞれの質問に1つずつ]

	とてもそう思う			全くそう思わない	
	1	2	3	4	5
より最適なローンを薦めてもらうために、質問数はもっと多くてもよい	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
このアドバイザーサイトの質問数は多すぎた	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
このサイトでカードローンを申し込みたい	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
この情報やコンテンツは、私にとって見やすく作られている	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
このサイトは利用しやすい	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
このサイトを「お気に入り」に追加したい	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
このサイトは、これまで見たほかのサイトよりも信頼感がある	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
このサイトには、計算ツールやプランナーなど役に立つツールがある	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
このサイトはすべてのカードローンの中から選択するうえで十分な情報を提供している	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
全体としてこのサイトを満足して利用できた	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
結果画面に表示された各カードローンは簡単に比較できる	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
このサイトを友人に紹介したい	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
このサイトはカードローンを選ぶ決定をする上で役にたつ	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
このコンテンツは読み手に訴えかけるように作られている	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
このサイトは正確で適切な情報を提供している	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

次へ

Q6.-Q9. Is asked first with "Orix", second with "Suruga", and third with "Acom"

Q6.

カードローンに関する調査

このサイトがオリックスによって提供されていたと仮定します。

カードローンを検討する可能性があると思った会社を次のリストよりいくつかでも選びください。

[あてはまるものすべてにチェックをしてください]

- リソナ銀行
- 住友信託銀行
- キャッシュ・ワン
- オリックス
- スルガ銀行
- 中央三井信託銀行
- モビット
- シンキ
- JCB
- プロミス
- 三井住友銀行
- レイク
- アイフル
- アットローン
- みずほ銀行
- アコム
- 楽天
- デイック
- 楽天クレジット
- オリコ
- 三菱東京UFJ銀行
- ジャパンネット銀行
- その他

次へ

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Q6a.

カードローンに関する調査

あなたはカードローンを検討する可能性のある会社として、オリックス、リソナ銀行、スルガ銀行、中央三井信託銀行、住友信託銀行、キャッシュ・ワン、を挙げられましたが、そのうち上位5社をあげてください。

[回答は5つ]

- 住友信託銀行
- オリックス
- キャッシュ・ワン
- スルガ銀行
- リソナ銀行
- 中央三井信託銀行

次へ

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Q7.

カードローンに関する調査

このサイトがオリックスによって提供されていると仮定して、オリックスについてご意見を伺いいたします。

以下にオリックスについての評価項目がございます。それぞれの項目をお読みになって、オリックスがどの程度あてはまるかについて「1：とてもそう思う」～「5：全くそう思わない」の5段階評価で、もっとも当てはまる番号をお答えください。

1. とてもそう思う
2. そう思う
3. どちらとも言えない
4. そう思わない
5. 全くそう思わない

[回答はそれぞれの質問に1つずつ]

オリックス

とてもそう思う

全くそう思わない

	1	2	3	4	5
オリックスは低金利を提供している	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
オリックスはよりスピーディーなローンを提供している (スピード)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
オリックスより価値のあるサービスを提供している(価値)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
オリックスはオープンかつ公正で、透明性が高い(質)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
オリックスはより柔軟に対応してくれるローンを提供している(審査の手軽さ)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
私はオリックスを友人に紹介したい	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
オリックスは積極的な顧客サポートを提供している	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
一般的に、オリックスを信頼している(信頼感)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

次へ

Q10.

カードローンに関する調査

ご覧になったカードローンのサイトは、閲覧者個人の認知スタイルと文化的信条という2つの側面を元に変化するようにならされていますが、あなたのこれらの側面を知るために、以下の質問にお答えください。

あなたのスタイルや考え方に関してお聞きする記述がありますので、それぞれの記述を読んで、どれくらい当てはまるかを答えて下さい

1. とてもそう思う
2. そう思う
3. どちらとも言えない
4. そう思わない
5. 全くそう思わない

[回答はそれぞれの質問に1つずつ]

	とてもそう思う			全くそう思わない	
	1	2	3	4	5
文章で読んだ光景を、頭の中に思い描くことができる。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
理想的な仕事を選ぶ上で、自分の時間が十分にとれるということは非常に重要だ。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
グラフや表を見た時に、これらが何を意味するのかを自分で考える前に、説明を読む。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
家族や友人のために物を買うことは、自分自身のために買うことよりも大切だ。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
上司や重要な人物の意見に反対することを、よくためらう。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
細部を重視するので、全体像を掴むためには、まず詳細な部分から入る。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
行動を起こす前に計画を立てるほうだ。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
何かを買う時には、あとさきの結果を深く考えたくない。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
製品やサービスを、グラフや表やチャートで比較検討するのが好きだ。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
権威やリーダーシップは、自分にとって、とても重要だ。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
物事の全体像よりも細部の方が気になる方だ。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
物を買う時には、他の人との違いを出すようにしている。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
細かい説明が好きだ。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
物を買う時には、主に専門家の意見を重視する。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

次へ

Shane's Questions: 1,2,3

カードローンに関する調査

バットとボールは、合計で\$1.10です。バットはボールよりも\$1.00高いです。ボールはいくらでしょうか？

セント

ある5台の機械では、5分で5個の製品が作れます。同じ機械100台で100個の製品を作るには、何分かかりますでしょうか？

分

池の中にスイレンがあります。このスイレンは毎日、倍の面積に増えて行きます。もし池を覆い尽くすのに48日かかるとすると、池の半分を覆い尽くすには何日かかるでしょうか？

日

次へ

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Demographics: DQ1, DQ2, DQ3

カードローンに関する調査

あなたの性別は？

[回答は1つ]

- 男性
- 女性

あなたの学歴は？

[回答は1つ]

- 高校卒、または下記以外
- 専門学校、短大卒等
- 大学卒
- 大学院卒以上

家族構成は？

[回答は1つ]

- 未婚
- 既婚、子供なし
- 既婚、子供あり

次へ

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Open Ends: Q1, Q2, Q3, Q4, Q5

カードローンに関する調査

ご覧になったカードローンのサイトに関して、以下の質問に自由にお答えください。

このサイトに関して、どう思いましたか？

このサイトで最も良かったところは何でしたか？

このサイトで最も良くなかったところは何でしたか？

このサイトを友人に紹介したら、どのように紹介しますか？

このサイトは借額できましたか？もし借額できなかった場合、他に何があれば借額できるサイトになると思いますか？

[次へ](#)

Completion page (Language becomes appropriate when link is live)



Cookieが無効です

ブラウザの設定でCookieが無効になっているか、情報が不正です。

お手数ですがCookieを有効にした上で最初からやり直してください。

お問い合わせは、ご案内メールよりお願い致します。

Suruga Coded Variables

Coded Variable	Questionnaire Number	Question label
id		
amsid		
qs1	SQ1	Age
qs2	SQ2	Have you ever had card loan account?
qs3	SQ3	Have you ever used card loan?
qs4_1	SQ4	What kind of card loan did you have (do you have)? Card loan offered by bank
qs4_2	SQ4	What kind of card loan did you have (do you have)? Card loan offered by bank and consumer finance
qs4_3	SQ4	What kind of card loan did you have (do you have)? Card loan offered by credit finance
qs4_4	SQ4	What kind of card loan did you have (do you have)? Card loan offered by consumer finance
qs4_5	SQ4	What kind of card loan did you have (do you have)? Others.
qs4x	SQ4	What kind of card loan did you have (do you have)? Others, specified
qs5	SQ5	How many card loans do you have now?
qs6	SQ6	Are you considering a card loan in the near future?
qintro1		
qintro2		
q1_1	Q1	From the list of providers below, which provider would you consider as a possible provider for a card loan? Rakuten
q1_2	Q1	From the list of providers below, which provider would you consider as a possible provider for a card loan? Orix
q1_3	Q1	From the list of providers below, which provider would you consider as a possible provider for a card loan? Orico
q1_4	Q1	From the list of providers below, which provider would you consider as a possible provider for a card loan? JCB
q1_5	Q1	From the list of providers below, which provider would you consider as a possible provider for a card loan? Mitsubishi Tokyo UFJ Bank
q1_6	Q1	From the list of providers below, which provider would you consider as a possible provider for a card loan? Mitsui Sumitomo Bank
q1_7	Q1	From the list of providers below, which provider would you consider as a possible provider for a card loan? Mizuho Bank
q1_8	Q1	From the list of providers below, which provider would you consider as a possible provider for a card loan? Resona Bank
q1_9	Q1	From the list of providers below, which provider would you consider as a possible provider for a card loan? Suruga Bank
q1_10	Q1	From the list of providers below, which provider would you consider as a possible provider for a card loan? Japan net Bank
q1_11	Q1	From the list of providers below, which provider would you consider as a possible provider for a card loan? Cyuo Mitsui Trust Bank
q1_12	Q1	From the list of providers below, which provider would you consider as a possible provider for a card loan? Sumitomo Trust Bank
q1_13	Q1	From the list of providers below, which provider would you consider as a possible provider for a card loan? Lake
q1_14	Q1	From the list of providers below, which provider would you consider as a possible provider for a card loan? Promise
q1_15	Q1	From the list of providers below, which provider would you consider as a possible provider for a card loan? Acom
q1_16	Q1	From the list of providers below, which provider would you consider as a possible provider for a card loan? Aiful
q1_17	Q1	From the list of providers below, which provider would you consider as a possible provider for a card loan? Dic
q1_18	Q1	From the list of providers below, which provider would you consider as a possible provider for a card loan? Shinki
q1_19	Q1	From the list of providers below, which provider would you consider as a possible provider for a card loan? Takefuji
q1_20	Q1	From the list of providers below, which provider would you consider as a possible provider for a card loan? Mobit
q1_21	Q1	From the list of providers below, which provider would you consider as a possible provider for a card loan? @Loan
q1_22	Q1	From the list of providers below, which provider would you consider as a possible provider for a card loan? Cash One
q1_23	Q1	From the list of providers below, which provider would you consider as a possible provider for a card loan? Other
q1x	Q1	From the list of providers below, which provider would you consider as a possible provider for a card loan? Other, specified
q1a_1	Q1a	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
q1a_2	Q1a	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
q1a_3	Q1a	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
q1a_4	Q1a	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
q1a_5	Q1a	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
q1a_6	Q1a	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
q1a_7	Q1a	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
q1a_8	Q1a	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
q1a_9	Q1a	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
q1a_10	Q1a	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
q1a_11	Q1a	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?

q1a_12	Q1a	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
q1a_13	Q1a	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
q1a_14	Q1a	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
q1a_15	Q1a	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
q1a_16	Q1a	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
q1a_17	Q1a	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
q1a_18	Q1a	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
q1a_19	Q1a	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
q1a_20	Q1a	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
q1a_21	Q1a	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
q1a_22	Q1a	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
q1a_23	Q1a	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
q2a_1	Q2 - first of top 5	Overall, I trust the provider
q2a_2	Q2 - first of top 5	The provider offers service at a better value
q2a_3	Q2 - first of top 5	The provider offers more flexibility in loan screening
q2a_4	Q2 - first of top 5	The provider offers speedier in loan screening
q2a_5	Q2 - first of top 5	The provider offers better interest rate
q2a_6	Q2 - first of top 5	The provider is open, honest, and transparent
q2a_7	Q2 - first of top 5	The provider is willing to assist and support me
q2a_8	Q2 - first of top 5	I would recommend this provider to a friend
q2b_1	Q2 - second of top 5	Overall, I trust the provider
q2b_2	Q2 - second of top 5	The provider offers service at a better value
q2b_3	Q2 - second of top 5	The provider offers more flexibility in loan screening
q2b_4	Q2 - second of top 5	The provider offers speedier in loan screening
q2b_5	Q2 - second of top 5	The provider offers better interest rate
q2b_6	Q2 - second of top 5	The provider is open, honest, and transparent
q2b_7	Q2 - second of top 5	The provider is willing to assist and support me
q2b_8	Q2 - second of top 5	I would recommend this provider to a friend
q2c_1	Q2 - third of top 5	Overall, I trust the provider
q2c_2	Q2 - third of top 5	The provider offers service at a better value
q2c_3	Q2 - third of top 5	The provider offers more flexibility in loan screening
q2c_4	Q2 - third of top 5	The provider offers speedier in loan screening
q2c_5	Q2 - third of top 5	The provider offers better interest rate
q2c_6	Q2 - third of top 5	The provider is open, honest, and transparent
q2c_7	Q2 - third of top 5	The provider is willing to assist and support me
q2c_8	Q2 - third of top 5	I would recommend this provider to a friend
q2d_1	Q2 - fourth of top 5	Overall, I trust the provider
q2d_2	Q2 - fourth of top 5	The provider offers service at a better value
q2d_3	Q2 - fourth of top 5	The provider offers more flexibility in loan screening
q2d_4	Q2 - fourth of top 5	The provider offers speedier in loan screening
q2d_5	Q2 - fourth of top 5	The provider offers better interest rate
q2d_6	Q2 - fourth of top 5	The provider is open, honest, and transparent
q2d_7	Q2 - fourth of top 5	The provider is willing to assist and support me
q2d_8	Q2 - fourth of top 5	I would recommend this provider to a friend
q2e_1	Q2 - fifth of top 5	Overall, I trust the provider
q2e_2	Q2 - fifth of top 5	The provider offers service at a better value
q2e_3	Q2 - fifth of top 5	The provider offers more flexibility in loan screening
q2e_4	Q2 - fifth of top 5	The provider offers speedier in loan screening
q2e_5	Q2 - fifth of top 5	The provider offers better interest rate
q2e_6	Q2 - fifth of top 5	The provider is open, honest, and transparent
q2e_7	Q2 - fifth of top 5	The provider is willing to assist and support me
q2e_8	Q2 - fifth of top 5	I would recommend this provider to a friend
q3_1	Q3 - first of top 5	Purchase Intentions/Likelihood of Purchase

q3_2	Q3 - second of top 5	Purchase Intentions/Likelihood of Purchase
q3_3	Q3 - third of top 5	Purchase Intentions/Likelihood of Purchase
q3_4	Q3 - fourth of top 5	Purchase Intentions/Likelihood of Purchase
q3_5	Q3 - fifth of top 5	Purchase Intentions/Likelihood of Purchase
q4_1	Q4 - first of top 5	Now we would like to understand how likely you are to acquire a card loan from each provider in which you have indicated an interest.
q4_2	Q4- second of top 5	Now we would like to understand how likely you are to acquire a card loan from each provider in which you have indicated an interest.
q4_3	Q4 - third of top 5	Now we would like to understand how likely you are to acquire a card loan from each provider in which you have indicated an interest.
q4_4	Q4 - fourth of top 5	Now we would like to understand how likely you are to acquire a card loan from each provider in which you have indicated an interest.
q4_5	Q4 - fifth of top 5	Now we would like to understand how likely you are to acquire a card loan from each provider in which you have indicated an interest.
q5_1	Q5	The site is easy to use
q5_2	Q5	The site provides accurate and relevant information
q5_3	Q5	The site provides me with sufficient information to make a decision on all card loans being offered
q5_4	Q5	The site has useful support tools (such as a calculator or planner)
q5_5	Q5	Card loan offerings can easily be compared
q5_6	Q5	The site is helpful to me in reaching my acquisition decisions
q5_7	Q5	I enjoyed the overall experience of the site
q5_8	Q5	This site appears to be more trustworthy than other sites I have visited
q5_9	Q5	I would acquire a card loan at this site
q5_10	Q5	I would recommend this site to a friend
q5_11	Q5	I would bookmark this site
q5_12	Q5	The advisor on this site asked me too many questions
q5_13	Q5	To recommend more suitable loan packages, I would be willing to answer more questions
q5_14	Q5	The content was written in a way that I found very appealing
q5_15	Q5	The information and content was presented in a way that I am most comfortable with
qor6_1	Q6 - for Orix	Assuming that Orix brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qor6_2	Q6 - for Orix	Assuming that Orix brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qor6_3	Q6 - for Orix	Assuming that Orix brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qor6_4	Q6 - for Orix	Assuming that Orix brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qor6_5	Q6 - for Orix	Assuming that Orix brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qor6_6	Q6 - for Orix	Assuming that Orix brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qor6_7	Q6 - for Orix	Assuming that Orix brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qor6_8	Q6 - for Orix	Assuming that Orix brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qor6_9	Q6 - for Orix	Assuming that Orix brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qor6_10	Q6 - for Orix	Assuming that Orix brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qor6_11	Q6 - for Orix	Assuming that Orix brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qor6_12	Q6 - for Orix	Assuming that Orix brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qor6_13	Q6 - for Orix	Assuming that Orix brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qor6_14	Q6 - for Orix	Assuming that Orix brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qor6_15	Q6 - for Orix	Assuming that Orix brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qor6_16	Q6 - for Orix	Assuming that Orix brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qor6_17	Q6 - for Orix	Assuming that Orix brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qor6_18	Q6 - for Orix	Assuming that Orix brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qor6_19	Q6 - for Orix	Assuming that Orix brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qor6_20	Q6 - for Orix	Assuming that Orix brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qor6_21	Q6 - for Orix	Assuming that Orix brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qor6_22	Q6 - for Orix	Assuming that Orix brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qor6_23	Q6 - for Orix	Assuming that Orix brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qor6x	Q6 - for Orix	Assuming that Orix brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qor6a_1	Q6a - for Orix	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qor6a_2	Q6a - for Orix	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qor6a_3	Q6a - for Orix	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qor6a_4	Q6a - for Orix	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qor6a_5	Q6a - for Orix	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?

qac6_14	Q6 - for Acom	Assuming that Acom brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qac6_15	Q6 - for Acom	Assuming that Acom brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qac6_16	Q6 - for Acom	Assuming that Acom brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qac6_17	Q6 - for Acom	Assuming that Acom brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qac6_18	Q6 - for Acom	Assuming that Acom brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qac6_19	Q6 - for Acom	Assuming that Acom brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qac6_20	Q6 - for Acom	Assuming that Acom brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qac6_21	Q6 - for Acom	Assuming that Acom brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qac6_22	Q6 - for Acom	Assuming that Acom brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qac6_23	Q6 - for Acom	Assuming that Acom brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qac6x	Q6 - for Acom	Assuming that Acom brought you this website, which providers would you now consider from the list of providers below, as a card loan provider?
qac6a_1	Q6a - for Acom	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qac6a_2	Q6a - for Acom	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qac6a_3	Q6a - for Acom	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qac6a_4	Q6a - for Acom	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qac6a_5	Q6a - for Acom	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qac6a_6	Q6a - for Acom	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qac6a_7	Q6a - for Acom	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qac6a_8	Q6a - for Acom	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qac6a_9	Q6a - for Acom	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qac6a_10	Q6a - for Acom	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qac6a_11	Q6a - for Acom	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qac6a_12	Q6a - for Acom	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qac6a_13	Q6a - for Acom	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qac6a_14	Q6a - for Acom	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qac6a_15	Q6a - for Acom	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qac6a_16	Q6a - for Acom	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qac6a_17	Q6a - for Acom	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qac6a_18	Q6a - for Acom	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qac6a_19	Q6a - for Acom	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qac6a_20	Q6a - for Acom	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qac6a_21	Q6a - for Acom	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qac6a_22	Q6a - for Acom	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qac6a_23	Q6a - for Acom	You stated that you would consider _____. Of these providers, which are the top five you consider as possible providers for your next card loan?
qac7_1	Q7 - for Acom	Overall, I trust Acom
qac7_2	Q7 - for Acom	Acom offers service at a better values
qac7_3	Q7 - for Acom	Acom offers more flexibility in loan screening
qac7_4	Q7 - for Acom	Acom offers speedier in loan screening
qac7_5	Q7 - for Acom	Acom offers better interest rate
qac7_6	Q7 - for Acom	Acom is open, honest and transparent
qac7_7	Q7 - for Acom	Acom is willing to assist and support me
qac7_8	Q7 - for Acom	I would recommend this Acom to a friend
qac8_1	Q8 - for Acom	Please rank the providers you have selected in Q6 in order of your preference for your card loan
qac8_2	Q8 - for Acom	Please rank the providers you have selected in Q6 in order of your preference for your card loan
qac8_3	Q8 - for Acom	Please rank the providers you have selected in Q6 in order of your preference for your card loan
qac8_4	Q8 - for Acom	Please rank the providers you have selected in Q6 in order of your preference for your card loan
qac8_5	Q8 - for Acom	Please rank the providers you have selected in Q6 in order of your preference for your card loan
qac9	Q9 - for Acom	Please rate on a scale of 0-10 your likelihood of acquiring a card loan from Acom
q10_1	Q10	I'm usually afraid to express disagreement with my superiors or with important persons
q10_2	Q10	I prefer planning before acting
q10_3	Q10	In choosing my ideal job it would be very important to have sufficient time for my personal life
q10_4	Q10	I see what I read in mental pictures
q10_5	Q10	I buy products in order to differentiate myself from other people

Q10 Buying products for my family and friends is more important to me than buying things for myself
Q10 I am detailed oriented, and start with the details in order to build a complete picture
Q10 I value mostly experts' options when I buy a product
Q10 I enjoy deciphering graphs, charts and diagrams about products and services
Q10 I like detailed explanations
Q10 I'm usually more interested in parts and details than in the whole
Q10 think authority and leadership are very important in my life
Q10 I like to make purchases without thinking too much about the consequences
Q10 I will read an explanation of a graphic/chart before I try to understand the graph/chart on my own
Shane's Ques: 1 A bat and a ball cost \$1.10 in total. The bat costs \$1.00 more than the ball. How much does the ball cost?
Shane's Ques: 2 If it takes 5 machines 5 minutes to produce 5 widgets, how long would it take 100 machines to produce 100 widgets?
Shane's Ques: 3 In a lake, there is a patch of lily pads. Every day the patch doubles in size. It takes 48 days for the patch to cover the lake, how long would it take for the patch to cover half of the lake?
DQ1 What is your gender?
DQ2 What is your level of education?
DQ3 Family and children
Number of banks chosen in Q1/Q1a
First of top 5
Second of top 5
Third of top 5
Fourth of top 5
Fifth of top 5
Number of banks chosen (When Orix was asked in Qor6/Qor6a)
Orix first of top 5
Orix second of top 5
Orix third of top 5
Orix fourth of top 5
Orix fifth of top 5
Number of banks chosen (When Suruga was asked in Qsu6/Qsu6a)
Suruga first of top 5
Suruga second of top 5
Suruga third of top 5
Suruga fourth of top 5
Suruga fifth of top 5
Number of banks chosen (When Acom was asked in Qac6/Qac6a)
Acom first of top 5
Acom second of top 5
Acom third of top 5
Acom fourth of top 5
Acom fifth of top 5
TimeLeave
TimeReturn
Status
StartDate
StartTime
EndTime