

Mining purchasing decision rules from service encounter data of retail chain stores

Fu-Ren Lin · Rung-Wei Po ·
Claudia Valeria Cruz Orellan

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Abstract In this explorative research, we aim to find the most important service experience variables that determine customer purchasing decision and the clerks' influence on customers' purchases. This study was conducted as a case study of a children's apparel company, denoted Company L, which has 243 retail stores. Company L has implemented Point of Sale (POS) systems in its retail stores, and would like to know what functions could be added to induce storefront employees to deliver better customer service. We, therefore, focus on observing the services provided by storefront employees and their reflection on a customer's purchasing decision in a retail store. The study generated decision trees via Weka, a data mining open source software platform, to analyze multiple data sources to (1) understand what makes a good service experience for a customer, (2) get explicit knowledge from service encounter information, and (3) externalize the tacit knowledge of storefront service experiences. These findings can be used to improve Company L's POS system to guide storefront employees to learn from trained decision rules. Moreover, the company can internalize service experience knowledge by aggregating learned rules from the company's retail stores.

Keywords Data mining · Service experience · Service encounter

F.-R. Lin (✉)
Institute of Service Science, National Tsing Hua University,
No. 101, Section 2, Kuang-Fu Road, Hsinchu 30013, Taiwan, ROC
e-mail: frlin@mx.nthu.edu.tw

R.-W. Po · C. V. C. Orellan
Institute of Technology Management, National Tsing Hua University,
No. 101, Section 2, Kuang-Fu Road, Hsinchu 30013, Taiwan, ROC

1 Introduction

Under the new economy of service, frontline workers and customers are at the center of management concern (Heskett et al. 2008). Service researchers are paying increasing attention to the interaction between customers and frontline employees in service businesses. A great deal of managerial concern has been directed toward service encounters. Some researchers studying people-based service encounters have proposed theories based on primitive emotional contagion and appraisal mechanisms, which predict that service with a smile will generate encounter satisfaction (Barger and Grandey 2006). Moreover, these researchers have examined the essential elements of service encounters from a role theoretical perspective, which has been connected to service performance (Broderick 1998). Importantly, the service encounter affords the single greatest opportunity for a service firm to customize its service for individual customers (Surprenant and Solomon 1987). In 2008, Heskett and his co-authors took a close look at the links in the service-profit chain, which applies hard values on soft measures and allows managers to calibrate the impact of employee satisfaction, loyalty, and productivity on the value of products and the services delivered. Managers can then use this information to generate customer satisfaction and loyalty and assess the corresponding impact on firm profitability and growth.

Giving frontline employees more discretion requires a selection process that identifies candidates with the potential of adaptability in their interpersonal behaviors. When Company L adopted a new Point of Sale (POS) system in its 243 stores, it wanted to know what elements should be added to help front workers provide better customer service experiences. Company L is known as the leader in the children's apparel industry in Taiwan. However, its product offering goes far beyond garments; the company strives to satisfy even the smallest customer need, trying to fulfill every possible desire. In this way, the company carries a significant amount of children-related articles in addition to a limited product offering for pregnant women. All this variety is not just offered in Taiwan; the company has expanded to Thailand (1989), Indonesia (1991), China (1993), and Singapore (1999). Of these new markets, China has experienced the most rapid expansion, reaching 426 retail stores. The store count is displayed in Table 1. A retail store plays a dominant role in providing services and contributing to business performance. Company L's POS system was developed by its internal MIS department, and in addition to serving as an effective platform for sales and administrative applications, the POS system is an effective tool for the headquarter

Table 1 Store information of company L in 2005

Country	# of stores	Year launched
Taiwan	243	1971
China	426	1993
Indonesia	104	1991
Thailand	69	1989
Singapore	57	1999

to standardize sales processes across different stores. Company L's management emphasizes that customizing the delivery of service by storefront employees is critical to customer satisfaction. Additionally, it wanted to know what elements should be added to the POS system to help storefront employees enhance the customer service experience.

What are the most important attributes in providing good customer service? The data sources include observations, interviews, dyadic surveys, and sales data from the POS system. On one hand, we attempted to get explicit knowledge from dyadic surveys of storefront employees and customers; on the other hand, we attempted to externalize tacit knowledge through classification analysis based on machine learning techniques. This information technology can help us identify customer needs and the customer decision-making process.

The objective of this study is to determine the most important attributes, which can be used to improve customers' service experience. The knowledge of customer behavior rules provides insight and guides store managers to customize their service composition.

We focus on observing storefront employees during service encounters and measuring customer's subsequent purchase decisions in a store that offers mixed products or services. Each encounter is assumed to contain learned and consistent behavior patterns, and each participant exhibited certain behaviors to complete the transaction smoothly (Solomon et al. 1985).

2 Literature review

In recent years, many articles have summarized key findings from research topics related to service encounters and service experience (Barger and Grandey 2006; Bateson 2002; Cook et al. 2002; Dub and Morin 2001; Edvardsson 2005; Edvardsson et al. 2005; Fitzsimmons and Fitzsimmons 2001; Heskett et al. 2008). In this section, we summarize fundamental concepts in service encounters and customer experience as the basis of understanding the relationship between storefront employees and customers.

2.1 Service encounters

The customer service encounter is defined as "the moment of interaction between the customer and the firm" (Bitner et al. 1990). This interaction is inherently a communication process of "creating, transmitting, receiving, and interpreting messages between a source and its receiver" (Williams 1984). When a service representative performs a service for a customer, how can they ensure that the customer's intention was correctly interpreted? Although the core of most services is a person-to-person encounter, we still know very little about their underlying mechanisms because very few models or theories have been developed to measure these dynamic interactions.

The service encounter may be viewed as a triad (Fig. 1), with the customer and the contact personnel both exercising control over the service process in an

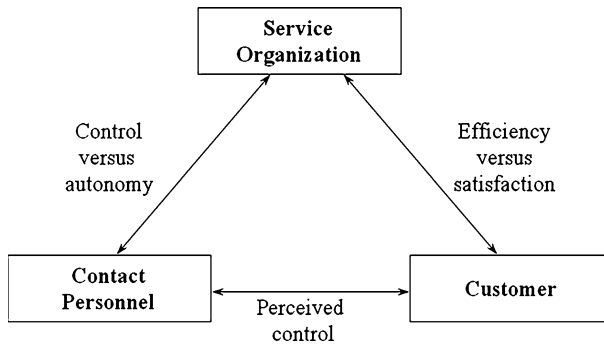


Fig. 1 The service encounter triad

environment that is defined by the service organization (Bateson 1985). It is depicted as a triangle formed by the interacting interests of the customer, service organization, and contact personnel. The customer, by working with the contact personnel within the framework imposed by the service organization, expects to obtain service satisfaction. The contact personnel, by serving the customer in the way specified by the service organization, expect to obtain job satisfaction and customer satisfaction. The service organization must satisfy the contact personnel and the customer in a manner that is economically viable from an operational perspective (Cook et al. 2002).

Previous researchers have also investigated how different factors affect customers' evaluation of service encounters, such as the powerful mediating effect of the attitude towards the servicescape and the sales personnel (Dub and Morin 2001). Several researchers have studied how a customer's evaluation of a service encounter is affected by the physical surroundings of the service provider (Bitner 1992; Dub and Morin 2001), by the interactions among customers at a service provider's location (Grove and Fisk 1997), by the content and style of the service encounters (Surprenant and Solomon 1987), and by the direct interactions between customers and customer-contact employees (Bitner et al. 1990; Bitner and Hubbert 1994). Researchers suggested that the quality of the interaction between customers and service providers in the service encounter is essential because it is the basis by which customers judge the service provided to them (Collier and Meyer 1998; Czepiel 1990; Gronroos 1990; Mohr and Bitner 1995). Researchers have generally described the service encounter as the period of time when a customer interacts with a service provider (Solomon et al. 1985; Surprenant and Solomon 1987).

Fundamentally, an interaction is a communication process between a customer and a service provider. Service encounters are considered purposive transactions, goal-oriented, and limited in scope. Service encounters have been defined as a single interaction between a customer and a person who provides the service. These individuals are often strangers, which reinforces the concept of service encounters as an integral part of customer relationship management. Customers and frontline workers accumulate information about each other, and then draw on that information when determining whether to continue the relationship during a

strategic decision. Approximately 75% of reported communication difficulties arise from causes other than a breakdown in the technical service delivery. These difficult encounters involve customers with unrealistic expectations that cannot be met by the service delivery system. Unrealistic customer expectations can be divided into six categories, which are listed in Table 2 (Fitzsimmons and Fitzsimmons 2001).

Previous service encounter research was performed primarily at the organizational level. In this research, we focus on learning, sensing, filtering, shaping, and calibrating the dyadic interaction between individual customers and storefront employees. Our research will help clerks internalize tacit knowledge, and learn about customers.

2.2 Customer experience

Experience represents a specific type of knowledge that has been acquired by an agent during a prior problem-solving situation. Experience is, therefore, situated in a very specific problem-solving context. Thus, experience is a form of stored knowledge (Bergmann 1999). The concept of “experience” remains vague and difficult to define in purely cognitive terms. Thus, it was proposed that when a customer purchases a service, he or she purchases an experience created by the service operations of a service organization (Bateson 1995).

We define a service experience as a service process that generates a cognitive, emotional, and behavioral response from the customer, resulting in a mental mark or memory (Edvardsson 2005). Traditionally, the service experience was used to describe and understand experience-intensive situations where people integrate information they perceive and encounter during and after consumption (Bateson 2002). The term *servicescape* (Bitner 1992), a combination of service and landscape, was developed to denote the environment where the service is performed and the experience that is created. Edvardsson co-created the “prepurchase service experience” through hyper-reality, which depicts how organizations can help customers test and experience a service prior to purchase and consumption (Edvardsson et al. 2005).

Edvardsson also introduced the concept of the “experience room,” the place where the simulated experience takes place. Firms can test their physical and intangible artifacts, train their employees to be familiar with the hyper-real customer experience, and decide the stage where the technology will be used. This concept has been used in service design, which is referred to as a “living lab” or “service

Table 2 Difficulties with interactions between customers and contact personnel

Unrealistic customer expectations	Unexpected service failure
Unreasonable demands	Unavailable service
Demands against policies	Slow performance
Unacceptable treatment of employees	Unacceptable service
Drunkenness	
Breaking of societal norms	
Special-needs customers	

Source: Fitzsimmons and Fitzsimmons (2001)

experience development.” The six design dimensions of experience rooms and their corresponding descriptions are summarized in Table 3.

Brown and Lam developed a meta-analysis for employee-customer relationships, linking employee job satisfaction (ES) to customer satisfaction (CS) and perceived service quality (SQ) in studies that correlate employee data with customer data (Brown and Lam 2008). They found that ES positively affects SQ and CS. These results are grounded primarily on three conceptual models: emotional contagion, the service—profit chain, and service climate (Brown and Lam 2008).

The interaction between service employees and customers is dynamic and requires responding to a variety of situations. We attempt to explore contextual pieces from this analysis on customers and frontline workers. Although many firms openly claim that frontline, or storefront, employees significantly influence profits and earning capacity, very few researches have explored the determinant factors that allow storefront employees to create a positive experience for customers during these dynamic service encounters, especially from a machine learning perspective.

We constructed a new model to help identify the most important determinant attributes and semi-automatic rules to bring insights of service encountering, and to improve service quality.

3 Method

This study provides a new perspective relative to previous research in this field. The retail stores of Company L generate a very large quantity of data about their customers’ purchases. The POS system of Company L aggregates this data, which can be used for a variety of purposes, such as inventory management. However, we attempted to create specific models that could be useful in predicting customer expectations. Therefore, we developed dyadic surveys for storefront employees and customers to externalize tacit knowledge. To analyze multiple datasets and build proper rules for the research, we decided to use the data mining method. Data mining is defined as the process of discovering patterns in data. The process must be automatic or, more typically, semiautomatic. A “divide and conquer” approach to the problem of learning from a set of independent instances naturally leads to a style

Table 3 Summary of the six design dimensions of the experience room

Design dimensions	Description
Physical artifacts	Physical attributes of the experience room (e.g., signs, symbols, and products)
Intangible artifacts	Intangible attributes of the experience room (e.g., mental images, brand, and culture)
Technology	The nature and role of technology
Customer placement	The “staging” of the customer in the experience room
Customer involvement	The involvement of the customer in the experience
The hyper-real service experience	The customer’s interpretation of the hyper-reality and hyper-real service provided in the experience room

of representation called a “decision tree” (Witten and Frank 2005). Decision trees provide a means to obtain product-specific forecasting models in the form of rules that are easy to implement. These rules have an IF–THEN form, which is easy for grocery employees to implement. This data mining approach can be used by grocery stores in a number of policy decisions, including inventory replenishment and evaluating alternative promotion campaigns (Olson and Shi 2007). Decision trees are useful for gaining further insight into customer behavior and for finding ways to profitably act on the results (Gordon 1998). The algorithm automatically determines which variables are most important based on its ability to sort the data into the correct output category. The method has a relative advantage over neural networks and genetic algorithms because a reusable set of rules are generated, thus explaining the model’s conclusions (Michie 1998).

We present the research framework in Fig. 2. First, we had to clean the data and combine some attributes to reduce the number of dimensions in the database. Next, we received four datasets, each of which contained failure and successful purchase surveys that were filled out by storefront employees, customer service experience surveys, and the corresponding transaction records from Company L’s POS system.

Each dataset was classified through a decision tree analysis with the aid of Weka Data Miner. Weka (Waikato Environment for Knowledge Analysis) is a comprehensive Java library of machine learning (ML) packages (Witten and Frank 2005) that can implement many state-of-the-art learning and data mining algorithms, such as decision trees, rule sets, Bayesian classifiers, support vector machines, logistic and linear regressions, multilayer perceptions, and nearest-neighbor methods as well as meta-learners, such as bagging, boosting, and stacking (Weka3.4.4 2009). The strength of Weka lies in its data classification as it covers many of the most current machine learning approaches. Weka offers four tools in its primary graphical user interface (GUI), which include Simple CLI, Explore, Experimenter, and Knowledge Flow. We use the Explore tool, which can mine the data interactively. The generalized three-stage workflow of the Weka system is displayed in Fig. 3.

Decision trees are one of the most popular types of predictive models. A decision tree is created by partitioning a large dataset into subsets, and then partitioning each of the subsets until they can no longer be partitioned. With each successive division, the members of the resulting sets become increasingly similar to one another. In keeping with the tree metaphor, the original dataset is the root node, the subsets are nodes, and the unpartitioned subsets are leaves. Branches that propagate from a node are the subsets that are created by partitioning a node. Decision trees are

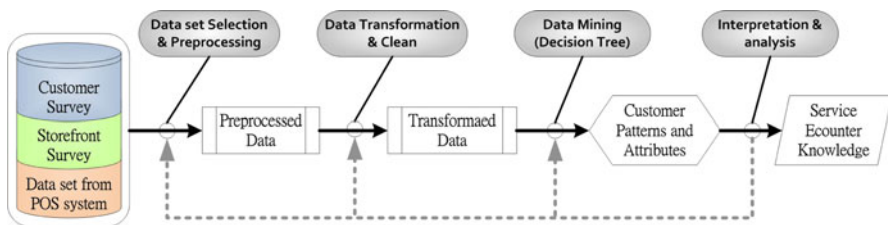


Fig. 2 Research framework

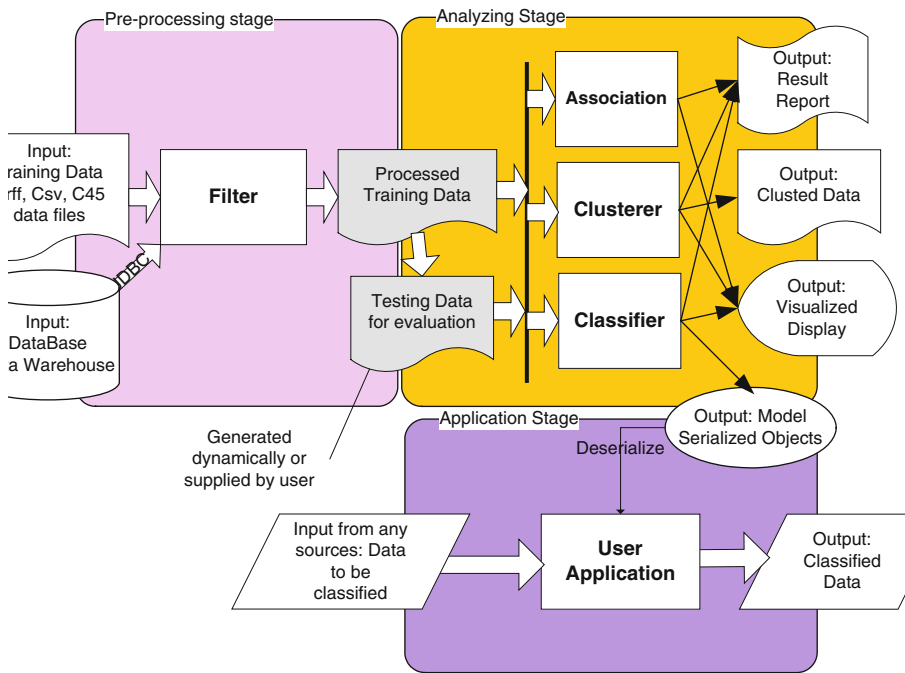


Fig. 3 Workflow of the Weka system

designed to partition a large heterogeneous group of data into smaller, homogeneous groups with respect to particular target variables.

By creating homogeneous groups, we can predict with greater certainty how the members of each group behave. The final groups, shown as leaves on the tree, are defined by a sequence of partitioning rules (Weka3.4.4 2009). Data records are in the form $(x, y) = (x_1, x_2, x_3, \dots, x_k, y)$. The dependent variable, y , is the variable that we are trying to understand, classify, and generalize. In this study, two dependent variables were utilized under two case scenarios. The other variables $x_1, x_2, x_3, \dots, x_k$ are the independent variables that determine the class. A decision tree can be developed manually or automatically by applying any one of several decision tree algorithms to model the pre-classified data. In this study, we used the C4.5 classification algorithm where the attributes are selected based on the value of the information. We used the Weka Data Miner with a 10-fold cross-validation approach to evaluate the accuracy of the decision tree's prediction rules. This implies that 10 tree models will be generated and validated to decrease the error of the classification model.

We used Weka version 3.4.4 in this study. To our knowledge, there is no other study which uses the machine learning approach to determining service encounter factors between storefront employees and their customers. Therefore, this study was designed to develop several simple decision trees to assist firms and store managers in establishing priorities for the improvement of the customer service experience. All of our research results and implications will be interpreted in Sect. 4.

4 Data

In this section, we will provide the scheme and process of this study, which followed the research framework described in Fig. 1. About the selection of the particular store for research, we got the permission from Company L's headquarter, and requested a store with great gross sales and space as a representative servicescape for our survey and observation because gross sales is usually an important measure for a children's apparel retail market. We did not only measure the amount of products that a store sells relative to other chain stores and its competitors, but also searched for storefronts with good service quality which reflects consumers' purchasing habits. After meeting with executives of Company L and several employees at the marketing, sales, MIS departments and a local manager of the northern area in Taiwan, a store in Hsinchu city in Taiwan had been picked on early March 2008. Then, we had a formal meeting with a supervisor of the store and a local manager to modify items of the draft questionnaire, the guideline and the procedure of distributing questionnaires and conducting observation by storefronts. The invoice number was used as the primary key among three data sets: customer survey, purchased and non-purchase observation survey by four clerks, and sales database of Company L. We conducted two kinds of survey by the end of March, 2008.

4.1 Observations and interviews

In order to answer our research questions, and design the survey, we made several observations regarding service encounters in one particular store. Our observations included visits to the store, videos, photographs, interviews with storefront employees, and other reference materials. The physical environment, or servicescape, of the supporting service facility influences both customer and employee behavior (Bitner 1992). The observations made in the retail store are important. Specifically, when administering the survey, we must know the service promoting intention of the storefront employees. We performed four rounds formal interviews and four rounds of informal observations.

We did all interviews for three purposes. First, we wanted to clarify the most important value among higher and middle managerial levels of Company L and storefronts when service encounter happened. Second, the POS system of Company L offered many new functions, such as posting news, sales knowledge and procedure training and services supportive in search products. However, Company L is attempting to promote POS system as a service platform that can collect more soft side information of customers. Therefore, we tried to identify research issues from the implications of their expectations. Third, we had to make our assumption and discussions into operational definition and for research construct consolidation, we interview four clerks four times, as we described at previous paragraph.

Company L tried to build a dreaming shopping place for children apparel and living related accessories. Each supervisor of the chain store has the authority to lay out their servicescape with products. After several observations were made,

we found that the concept of the “experience room,” (Edvardsson et al. 2005) have been using in the store of research target. The store comprises two floors with a comfortable interior design which created a pleasant mood and atmosphere. The supervisor of this store visited the storefront each week, and they used physical and intangible artifacts to match the season changing, festival or topics made by the headquarter. Because the gross sale is usually the top three among 243 chain stores, the firm often used this store for new product and concept test. Several small group seminars were held for training purpose that makes the employees of this store more familiar with the hyper-real customer experience. The POS system technology was set up here at first stage, and the extension trail test with research purpose was executed in the store as well. Therefore, this store became a “real” experience room for service innovative design; all customers who got into the store played a simulation role for service quality or experience enhancements.

The first floor kept children clothing and shoes, baby nursing products, and baby toys. Additionally, there is a small playground for children and tiny kid’s sofas designed for children sit in with storybook reading. It kept children in the play zone while their parents were looking for products. The second floor carries garments, accessories and general care products for babies and toddlers, and some products for pregnant women. On both floors, clothes are displayed in sections by brand, and each section contains a catalogue of each brand. Every available style is displayed, including all the colors and sizes. Some styles are exhibited through the use of mannequins, while other clothes are either hung or folded. Baby clothes are displayed in bags, and accessories and toys are placed together on each floor.

4.2 Retail store service procedure

When a customer enters the store, one employee approaches the customer to help them find the products that suit their needs. However, if the customer prefers no storefront employee assistance, the storefront employee may stay close by to answer any questions the customer might have. When a customer asks for a specific product, the storefront employee displays the available options, and offers other garments if the customer is not happy with what the storefront employee has provided. Moreover, if the customer has decided on one product, the storefront employee might suggest other items that match the chosen product.

If, after this process, the customer still seems unsatisfied and unwilling to purchase anything, the storefront employee often tries to convince the customer to decide between one of the available options. Finally, if the customer decides to purchase a certain product, the storefront employee carries the selected item to the cashier and leaves the customer to browse through other products. Once the customer has finally determined what they want to purchase, the storefront employee places all of the items in a bag and verifies if the customer has a membership card. If not, the storefront employee enters the purchase into the POS system and, if applicable, explains the membership benefits in an attempt to

persuade the customer to fill out the forms to become a member. Finally, the storefront employees hand in the customer their purchase.

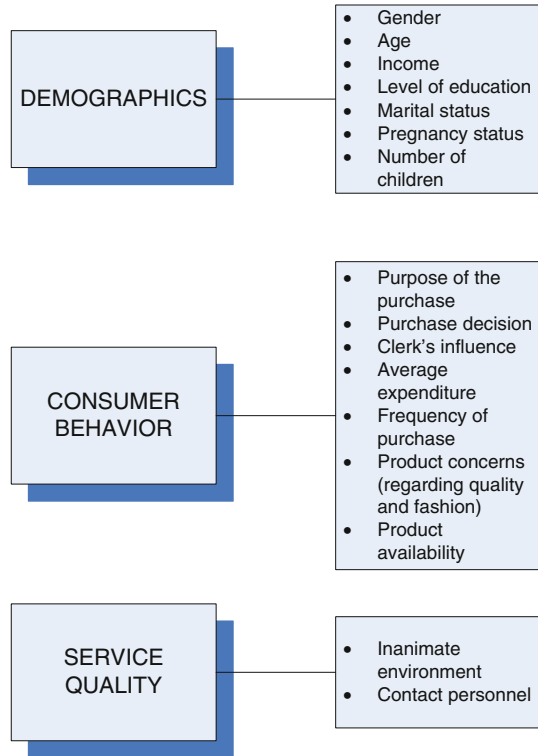
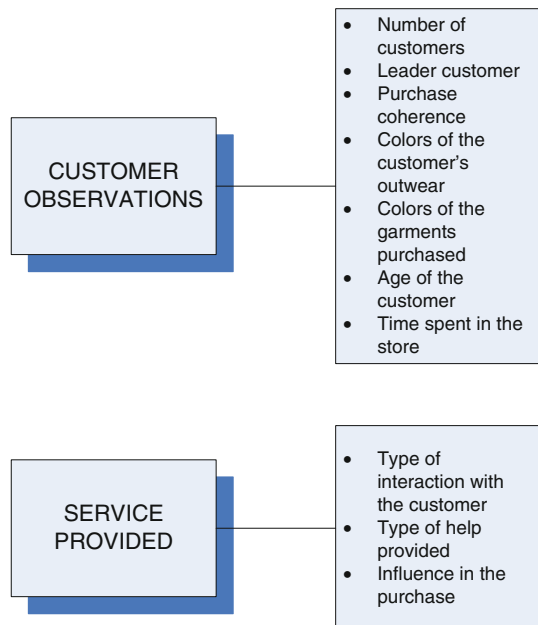
4.3 Survey design

Through the antecedent literature review, we know that customers' evaluation of service encounters was affected by the servicescape change, sales personnel interactions between customers, the content and style of the service encounters and quality of service encounter. Front employees are regarded as the key persons by the managerial level of Company L that obtained from four rounds formal interviews. Furthermore, store supervisors can lay out their view to dress the store and decide the best way to approach the customer. Therefore, we designed the first draft of the customer's survey based on the review of existing research literature, and through our observations and headquarters' opinions. Twenty-four closed-ended type questions included in three dimensions had been conducted. All items of demographics and consumer behavior dimensions were designed with multichotomous question type, which allowed respondents to choose one of many answers with a large set of potential choices. The third dimension of the survey is service quality that used Likert five-point scale for measuring customers subconsciously experienced service interaction and surrounding environment.

The next step is to design the clerk's survey that was consistently conducted in accordance with the design of customer's survey. Seventeen items were observed by the storefront employees belonging to customer observations dimension and the consciousness of their service provided. After several discussions, we created first version of two kinds of questionnaire, and then tested it with a small group to verify that the questions were easy to answer, the descriptions were clear and understandable, and that the storefront employees understood the procedure that had to be followed to carry out the surveys. We expected to analyze several questions. What purchase decisions are affected by a service encounter? What are the major factors in these decisions? Questionnaires for storefront employees applied to both purchase and non-purchase cases, but the customer only filled out a survey if a purchase was made. All attributes were conducted to develop a more nuance approach to analyze service experience dissimilarity between storefront clerks and customer they served. The information collected from the survey of customers and storefront employees is displayed in Figs. 4 and 5. The questionnaires are listed in "Appendix C".

4.4 Data collection

We first conducted a pilot test to verify that the questions were easy to answer, the description was clear and understandable, and that the storefront employees knew how to follow the survey procedures. After the pilot test, we made some adjustments to the surveys, and an experiment guideline was written to avoid confusion. The survey then was conducted at the end of March, 2008. The dataset collection began at the end of April 2008 and concluded in early June 2008; a total of over 200

Fig. 4 Customer's survey attributes**Fig. 5** Clerk's survey attributes

surveys were completed. The questionnaires were translated into Chinese and delivered to the corresponding stores during that period of time. The data collected from the surveys was linked to the corresponding POS system based on purchase invoice numbers, which can be verified in the surveys and are annexed to this study. Finally, we developed a service encounter database from three datasets: POS data, surveys from clerks, and surveys from customers. The datasets contained 147 purchase instances and 27 non-purchase instances.

A complete study of the customer experience should include every participant in the system. Therefore, it is critical that the study includes not only customer data, which is traditionally taken in surveys, but also frontline worker data. To generate both datasets, we designed surveys to mirror the behavior of both actors in the system. However, as we knew from previous studies, customer behavior is typically subjective and may not be reliable. Including the storefront employee's point of view might increase the truthfulness of the sample, however, we must, once again, remember that a subjective component exists in their responses as well. Given both sources and their characteristics, a dataset without such biases can provide objective and precise information. The best dataset available for this purpose is generated by the POS system. The dataset includes invoice number, items purchased, individual item price, and total price.

These four clerks were all female and were all well trained to sell children's apparel and related accessories. Due to the unbalanced quantity of purchase versus non-purchase instances, we replicated the non-purchased dataset four times to fit the data to the classification algorithm. Each instance includes detailed demographic information and summarized purchase amounts. The original data is arranged in a CSV file, which contains 44 attributes. These attributes are shown in Figs. 4 and 5. Then, we used filters to preprocess the data, generating various sets of training data for different data mining algorithms. Finally, we used "purchase" and "storefront employee's influence" as the two classification tasks.

A total of 166 customers completed our questionnaire. After removing missing values or duplicates, we had questionnaires completed by 121 unique customers, which is 72.9% of data from customers making purchase. The respondents included 110 females and 11 males as well as 89 people between the ages of 25 and 39 (73.6%), 22 people between the ages 40 and 60 (18.2%), 6 people above the age of 60 (5%), and 4 people under the age of 25 (3.3%). Of our respondents, 51.2% were the principal drivers behind the retail visit, while 48.8% were simply accompanying someone else. Storefront employees thought they affected 54.6% of customer's purchase decisions. Of these influenced decisions, 28% were first sight purchases and 17.4% purchased after browsing. However, 47.1% of customers believed their shopping behavior was affected by a clerk's service. We found several interesting distinctions when comparing the same question from the opposing perspective.

4.5 Decision tree analysis

After the datasets were cleaned and treated, we combined some features to reduce the number of dimensions in the database. Given the complexity of the datasets and

Table 4 Two dependant attribute description

Data sets	New datasets of attributes	Instances	Purpose
Storefront employee's survey (purchase and non-purchase)	Purchase	147 + 108 (27 × 4)	Determine whether a customer makes a purchase
1. Customer's survey	Storefront employee's influence	121	Determine whether a customer feels that their purchase has been influenced by a clerk
2. Storefront employee's survey			
3. POS data			

to get a better set of rules, some of the attributes were blended, some were expressed in a more comprehensive manner, and, in some cases, the values of the attributes were reduced. This data manipulation resulted in two datasets, each of which is described in Table 4.

5 Results

As described in Table 4, the first data set “purchase” integrated from two original data sets of the storefront employees, one is the purchase set with 147 instances, and the other is a non-purchase set with 108 instances. These attributes are the factors affecting purchase analysis. The second one is “Storefront employee's influence” were blended from three data sets: 121 Customer's survey instances, 147 Storefront employee's survey of purchased and corresponding to the POS data with same invoice number. This data set is used for identifying what kinds of customer are influenced by storefront employees. We can see that the four data sets were merged to two new data sets to reduce complexity. Each new dataset is expressed using more comprehensive rules, and some values in the original dataset were reduced. The dataset for the decision tree manipulation is illustrated in Table 5.

5.1 Factors affecting purchase

Through the fusion of these databases, two models were created to analyze the most important factors in Company L's service system. Only twelve attributes were considered because some questions were not applicable in the non-purchasing situations. The accuracy of the generated decision tree is 88.65%. The rules of the decision trees were listed as Table 6.

In “Appendix A”, there are two numbers in each pair of parentheses. The first number represents the correctly classified instances, and the second number represents the incorrectly classified instances. The tree indicates that, in many cases, there are no instances in parentheses. In other words, once the tree is evaluated, no instances belonged to those branches. Therefore, there is little or no representativeness in those branches without correctly classified instances. Thus, only the rules

Table 5 Data sets and attributes

Attribute	Possible values	Definition
Storefront employee's survey (purchase and non-purchase)		
Customers	Group, alone	The customers entered Hsinchu retail store of Company L who appeared alone or with a group
Number of customers	Number	The numbers of entered customer
Customers' gender	F, M, FM, FG, FB, MB, MG, FMG, FMB (F = female, M = male, G = girl, B = boy)	The code represents customer's gender, there are nine customer types with data collected
Head of the group	M, F	The gender of head of the group
QuestFill	Y, N	Was the questionnaire filled out by the leader of the group?
Product coherence	Style, color, both, same goods, no	If the customer bought more than one product, where the products purchased coherent in style or color? Five observations were offered, coherence in style, color, both (color and style), same goods or different goods (no)
Help	YES, NO	Was clerk helping the customer?
Interaction	Asked, not asked, both	The type of circumstances of when interaction happened, which are multiple choices of the survey marked. We integrated four types' situations into three values. Asked: represented option 2, 3 Not asked: represented option 1, 4 Both: if a clerk marked each of both options
Shopping behavior	First sight, influenced, after a visit	The type of customer's shopping behavior were the first sight shopper, Influenced (means influenced by the clerk) or after a quick visit to the store
Feelings A	Happy, moody, busy, sad, stressed	Feelings when the customer entered to the store
Feelings B	Happy, moody, busy, sad, stressed	Feelings when the customer left the store

Table 5 continued

Attribute	Possible values	Definition
Color feeling A	Cold, warm, other	Color feeling of the customer's outfit. cold: option by Green, Blue, Brown, Black, Grey or white warm: options of Red, Pink, Orange, Purple, Yellow Other: only shadow colors
Shadow colors A	Y, N	Was the customer wearing shadow colors?
Color feeling B	Cold, warm, other	Color feeling of the customer's purchase. Cold: option by Green, Blue, Brown, Black, Grey or white warm: options of Red, Pink, Orange, Purple, Yellow other: only shadow colors
Shadow colors B	Y, N (Did the customer purchased items with shadow colors?)	Did the customer purchased items with shadow colors?
Customer age	25-, 25-40, 40-60, 60 + (Apparent age)	Customer Apparent age
Time spent	0 ~ 10, 11 ~ 20, 20+	The time spent of customer in the store
Customer's service experience survey		
Gender	M, F	The gender of the respondent (customer) M is male; F is Female
Pregnancy	Y, N	Did the female customer pregnant?
Children	Number	Number of children in customer's family
Marital status	M, S	The marital status of the customer M is married; S is single
Age	25-, 25-40, 40-60, 60 +	The age of the respondent (customer)
Family income	30,000-, 30,000-60,000, 60,000-90,000, 900,000+	The family income of customer; currency is New Taiwan Dollars.

Table 5 continued

Attribute	Possible values	Definition
Education	School, university, higher	The highest level of education completed School means the high school diploma or below University means the college or university diploma Higher means above university diploma
Purchase purpose	Season change, gift, outgrown clothes, other, b-day, new born, pregnancy	The purchase purpose of the customer who categorized for eight reasons
Purchase decision	I, Friend, Mate, Kid or Parent	Who made the final purchase decision?
Clerk influence	Y, N	Did Customer's shopping decision influence by a clerk of the store or not?
Average expenditure	200–1,000, 1,000–2,000, 2,000–3,000, 3,000+	The average expenditure of each time purchase
Purchase frequency	Just once, once a month, 2–3 month, several times a year, +3 month	The purchase frequency of the customer in L Company chain store
Clothing characteristics	Product, fashion, both	What was the mostly concerns of children clothing purchased? We integrated six elements to three categories. (multiple choices) Product: options for quality, price, easy care Fashion: style, trends, brand Both: Both categories were marked, which listed above
Find what you look for	Never, sometimes, usually, always	The probabilities of products match your expectation.
Fashionable displays	1, 2, 3, 4, 5 (poor to excellent)	Fashionable displays of the store which presented using a five-point Likert item
Up-to-date merchandise	1, 2, 3, 4, 5 (poor to excellent)	Up-to-date merchandise of the store which presented using a five-point Likert item
Nice store atmosphere	1, 2, 3, 4, 5 (poor to excellent)	Nice store atmosphere which presented using a five-point Likert item

Table 5 continued

Attribute	Possible values	Definition
Convenient display	1, 2, 3, 4, 5 (poor to excellent)	The store Convenient display which presented using a five-point Likert item
Appealing promo	1, 2, 3, 4, 5 (poor to excellent)	Appealing promotional materials of Company L, which presented using a five-point Likert item
Merchandise knowledge	1, 2, 3, 4, 5 (poor to excellent)	The clerks in the store who knew the merchandise's knowledge well, which presented using a five
Never busy	1, 2, 3, 4, 5 (poor to excellent)	The clerks in the store who are never too busy to respond your questions, which presented using a five
Willing to help	1, 2, 3, 4, 5 (poor to excellent)	The clerks in the store who are always willing to help, which presented using a five
Understanding	1, 2, 3, 4, 5 (poor to excellent)	The clerks in the store who understand your specific needs, which presented using a five
Courteous	1, 2, 3, 4, 5 (poor to excellent)	The clerks in the store who are courteous, which presented using a five
POS system dataset from company L		
Product category		Classifies the category of all the purchase
Average price		Average of the items of a given purchase
Total price		

Table 6 Rules affecting customer's purchase decision

IF Storefront Help = YES AND Time spent = 0–0 AND Feelings A = Happy (Feelings when the customer entered to the store) AND Shadow colors A = Y (customer wearing shadow colors) THEN predict Purchase = Y (Probability = 18/0, 100%)
IF Storefront Help = YES AND Time spent = 0–10 AND Feelings A = Happy (Feelings when the customer entered to the store) AND Shadow colors A = N (customer doesn't wearing shadow colors) AND Customers gender = F AND Head of the group = F (Customer's gender is female as same as the Head of the group) THEN predict Purchase = Y (Probability = 20/5, 80%)
IF Storefront Help = YES AND Time spent = 0–10 AND Feelings A = Busy (Feelings when the customer entered to the store) AND Head of the group = F (The gender of the head of the group is female or customer's gender is female comes along.) THEN predict Purchase = N (Probability = 20/5, 80%)
IF Storefront Help = YES AND Time spent = over 20 THEN predict Purchase = Y (Probability = 30/0, 100%)
IF Storefront Help = YES AND Time spent = 11–20 THEN predict Purchase = Y (Probability = 51/0, 100%)
IF Storefront Help = NO AND Shadow colors A = Y (customer wearing shadow colors) THEN predict Purchase = N (Probability = 47/2, 95.9%)
IF Storefront Help = NO AND Shadow colors A = N (customer doesn't wearing shadow colors) AND Customer = alone THEN predict Purchase = N (Probability = 16/1, 94.12%)

that have representativeness will be considered. Finally, the question marks in the tree represent empty values and are meaningless.

5.2 Factors affecting storefront employee influence

After cleaning the storefront employee's survey data, the customer's survey data, and the POS system information, 121 instances were collected. Of these, 57 cases exhibited an influence by the storefront employee on the customer's final purchase decision. In the remaining 64 cases, customers affirmed that storefront employees did not influence their final purchase decision. To increase the sample size, all the data were replicated once. Because all of the instances represented purchasing events, all the attributes were considered. After running the analysis, we obtained a decision tree with 73% accuracy. By eliminating the leaves that do not have representativeness and those with meaningless classifications, a procedure known as post-pruning, we obtained the final set of rules shown as Table 7.

"Appendix B" shows the resulting decision trees after the dataset is analyzed. Two "age" variables were used: "customer age" and "age." The first variable represents the age of the customer, as estimated by the storefront employee, and the second variable is the actual age of the customer.

5.3 Implications

The effectiveness of employee service can be proved by examining the storefront employee's influence on the customer's purchase. In a service encounter of brief

Table 7 Rules affecting storefront employee influence

IF Children = 1 AND Custmerage = 25–40 AND Family income = NT\$60,000–90,000(Monthly) AND Purchase Purpose = Outgrown clothes AND Storefront Help = YES AND Education = University AND Total price > NT\$960 THEN predict Storefront influence = Y (Probability = 16/0, 100%)
IF Children = 1 AND Custmerage = 25–40 AND Family income = NT\$30,000–60,000 THEN predict Storefront influence = N (Probability = 40/6, 86.96%)
IF Children = 2 AND Age = 25–40 AND Feelings A = Happy AND Product category = Clothing AND Shadow color B = N (Customer didn't purchased shadow color item) AND Convention display = 4.0 (convention display is good) THEN predict Storefront influence = N (Probability = 8/0, 100%)
IF Children = 2 AND Age = 25–40 AND Feelings A = Happy AND Product category = Article THEN predict Storefront influence = Y (Probability = 10/0, 100%)
IF Children = 2 AND Age = 25–40 AND Feelings A = Happy AND Productcategory = Both (clothing, article) THEN predict Storefront influence = Y (Probability = 10/0, 100%)
IF Children = 2 AND Age = 25–40 AND Feelings A = (Moody OR Sad OR Stressed) AND THEN predict Storefront influence = N (Probability = 10/0, 100%)
IF Children = 3 AND Purchase frequency = (2–3 month OR a year) THEN predict Storefront influence = N (Probability = 8/0, 100%)
IF Children = 4 THEN predict Storefront influence = N (Probability = 6/0, 100%)
IF Children = 0 (Single or without children) AND Head of the group = F AND Average price <=6,000 THEN predict Storefront influence = Y (Probability = 26/0, 100%)

duration, the customer's expectations are shaped by what they know of the service provider. To the customer, it does not matter which particular storefront employee is on duty to provide the service; each service provider is regarded as functionally equivalent and interchangeable. Nevertheless, at times, our research suggested that storefront employees who take the initiative in helping customers are more likely to encourage a purchase by the customer. Whether the customer decides to purchase is not based on personal relationships because customers have no commitment to any specific service provider, even though they may be committed to the service firm.

We retain salient tree branches as shown in “Appendix A”, which represents the “Purchase” decision as a combination of tangible and intangible behavior during the service encounter. Even if the customer spends a very short time in the store, if the customer gets assistance from the storefront, the representative rules indicate, that the customer will make a purchase decision when the customer appears happy (the color of a customer's clothes is a sign of their mood). Additionally, the customer's gender is a moderate factor. However, if the customer appears busy and visits the store either alone or with a group led by another female, no purchase will occur. The time spent with the customer is a critical factor. When a customer spends more than 11 min in the store, a purchase will be made if the customer receives help from a storefront employee. If a customer does not get any assistance and wears dull colors, no purchase will occur, especially when customer comes alone.

These findings suggest that storefront employees should take the initiative in helping the head of a group who visits their store. Additionally, their motional feelings will be reflected by the clothes they wear if the customer spends time browsing. Positive customer responses will induce purchases, which is consistent with the notion of interdependence effects (Bitner 1990; Bitner and Hubbert 1994; Dub and Morin 2001). The time spent with the customer suggests that the store environment should be set up to consist of cues that can influence people's internal evaluations and create approach responses for the customer. Psychologists suggest that people respond to environments with two general, contrasting forms of behavior: approach and avoidance (Mehrabian and Russell 1974). Our research results provide a way to implement a rule-based system of approaching service encounters.

Another machine learning analysis result that demonstrates the most representative rules for "Storefront employee's influence" factors is shown in "Appendix B". The storefront employee can influence a customer's purchase decision for "outgrown clothes" when the customer has one child, is between 25 and 40 years old, has high family income, and is highly educated (i.e., graduated from college). However, if the customer's family income is medium, the final purchase was not influenced by the storefront employee. Our research found the influence of the storefront employee to be reduced with two kinds of customers: those with more than two children and those who are over 40 years old. Importantly, these findings run contrary to the intuition of Company L's management team. In interviews with Company L executives, they believed that storefront employees can drive a customer's decision to purchase because all storefront employees were given some training at selling or promoting Company L's products. However, our results indicate that while customers expect assistance from storefront employees, they want to make purchasing decision without assistance.

The most interesting rule prediction generated by our findings suggests that the number of children and the average purchasing expenditure will be the critical factors in determining whether a customer is influenced by storefront employees. The older the customer, the more likely they are to make an independent decision without significant influence from storefront employees. Different family incomes also exhibit different behaviors. However, the findings strongly suggest that the demographic characters a retail store should pay attention to are consistent with our observations and interviews. These finding suggest that the supportive system (e.g., POS) could more closely track customer behavior based on the mining rules. Additionally, the company's training system (i.e., employee education) might increase specific knowledge of products for customer assistance purposes.

6 Conclusions

As our data indicate, customer assistance provided by storefront employees is a critical variable in the service system. Specifically, it can determine whether a customer makes a purchase. When a customer stays for a medium period of time

(approximately 11–20 min), a purchase occurs. This result leads to a storefront employee keeping the customer in the store, which results in a purchase. Another important rule centers on short time shopping; in these situations, the purchase decision is tied to the customer's mood and the color of their outfit. Dark colors usually indicate seriousness and may suggest that the customer is not really in the mood for shopping. However, if a customer appears pleased, the color the customer is wearing will not affect their purchasing decision. Both of these findings exposed that the color of a customer's outfit influences their service experience when that customer does not receive any assistance. This finding is also consistent with features of the apparel industry. Regarding a customer's mood, if the customer appears happy, they are more likely to be responsive to employee interaction; therefore, a purchase may occur. However, if the customer is a female and appears busy, she may not have sufficient interest in shopping, so a purchase is not likely to occur.

In both factor findings, the storefront employee is the major factor in the system as, in most cases, the storefront employee can greatly affect the outcome of a service experience, particularly if the storefront employee understands the customer's behavior. The rules we found may be a guide for the storefront employee to better understand customers and their needs, lead them through the entire service process, and conclude the interaction with a purchase. It is also important to mention that even though many variables related exclusively to the product have been considered, the decision trees we built indicate that some variables are not truly important. This verifies the initial hypothesis of this paper. Companies need to move toward a service approach instead of focusing solely on the products they sell.

Regarding the limitations of the study, there are two worthy of mention. First, the quantity of data collected was small; later studies should consider a larger number of instances to verify the rules found in this paper and improve the accuracy of the models we built. Second, as mentioned in the literature review, the apparel retail industry is highly seasonal. Our study was only conducted during a short period of time; thus, seasonality has not been considered. Future studies should include this factor in the research given its importance in the industry.

Appendix A

Decision tree for classifying purchase vs. non-purchase cases

```

Help = YES
| Timespent = 0to10
| | FeelingsA = Happy
| | | ShadowcolorsA = ?: Y (2.0)
| | | ShadowcolorsA = Y: Y (18.0)
| | | ShadowcolorsA = N
| | | | Customersgender = FM
| | | | | ColorfeelingA = ?: N (0.0)
| | | | | ColorfeelingA = cold: Y (2.0)
| | | | | ColorfeelingA = other: N (0.0)
| | | | | ColorfeelingA = warm: N (11.0/1.0)
| | | | Customersgender = FGB: N (0.0)
| | | | Customersgender = F
| | | | | Headofthegroup = M: Y (0.0)
| | | | | Headofthegroup = F: Y (20.0/5.0)
| | | | | Headofthegroup = FG: Y (0.0)
| | | | | Headofthegroup = FM: Y (0.0)
| | | | | Headofthegroup = ?: N (5.0)
| | | | Customersgender = FMG: Y (4.0)
| | | | Customersgender = FG : N (0.0)
| | | | Customersgender = FG: N (0.0)
| | | | Customersgender = FMB: N (0.0)
| | | | Customersgender = FB: Y (1.0)
| | | | Customersgender = FMGB: N (5.0)
| | | | Customersgender = MG: N (0.0)
| | | | Customersgender = M : N (0.0)
| | | | Customersgender = M: N (0.0)
| | | FeelingsA = ?: N (0.0)
| | | FeelingsA = Moody: N (12.0/2.0)
| | | FeelingsA = Busy
| | | | Headofthegroup = M: Y (2.0)
| | | | Headofthegroup = F: N (20.0/5.0)
| | | | Headofthegroup = FG: N (0.0)
| | | | Headofthegroup = FM: N (0.0)
| | | | Headofthegroup = ?: N (0.0)
| | | FeelingsA = Sad: Y (2.0)
| | | FeelingsA = Stressed : N (5.0)
| | | FeelingsA = Pensative: N (0.0)
| | Timespent = 20+: Y (30.0)
| | Timespent = 11to20: Y (51.0)
| | Timespent = ?
| | | Headofthegroup = M: N (0.0)
| | | Headofthegroup = F: Y (4.0)
| | | Headofthegroup = FG: N (0.0)
| | | Headofthegroup = FM: N (0.0)
| | | Headofthegroup = ?: N (5.0)
| Help = NO
| | ShadowcolorsA = ?: N (0.0)
| | ShadowcolorsA = Y: N (47.0/2.0)
| | ShadowcolorsA = N
| | | Customer = group: Y (4.0)
| | | Customer = alone: N (16.0/1.0)
| | Help = ?: N (16.0/1.0)

```

Appendix B

A decision tree for classifying influence vs. non-influence cases

```

Children = 1.0
| Customerage = 25-40
| | Familyincome = 60000-90000
| | | PurchasePurpose = Seasonchange: N (6.0)
| | | PurchasePurpose = Gift
| | | | Interaction = Both: N (2.0)
| | | | Interaction = Notasked: Y (2.0)
| | | | Interaction = Asked: N (0.0)
| | | | Interaction = ?: N (0.0)
| | | PurchasePurpose = Outgrownclotnes
| | | Help = YES
| | | | Education = University
| | | | | Totalprice <= 960
| | | | | ColorfeelingB = ?: N (0.0)
| | | | | ColorfeelingB = other: N (0.0)
| | | | | ColorfeelingB = warm: N (4.0)
| | | | | ColorfeelingB = cold: Y (2.0)
| | | | | Totalprice > 960: Y (16.0)
| | | | Education = School: Y (2.0)
| | | | Education = Higher: N (2.0)
| | | | Education = ?: Y (0.0)
| | | | Help = NO: N (2.0)
| | | | Help = ?: Y (0.0)
| | | PurchasePurpose = B-day: Y (2.0)
| | | PurchasePurpose = Other: N (4.0)
| | | PurchasePurpose = Festiveholiday: Y (0.0)
| | | PurchasePurpose = Newborn: Y (0.0)
| | | PurchasePurpose = Pregnancy: Y (0.0)
| | | Familyincome = 30000-60000: N (40.0/6.0)
| | | Familyincome = 90000+
| | | | Convenientdisplay = ?: N (0.0)
| | | | Convenientdisplay = 5.0: N (2.0)
| | | | Convenientdisplay = 4.0: Y (6.0)
| | | | Convenientdisplay = 3.0: N (6.0)
| | | Familyincome = 30000-: Y (2.0)
| | | Familyincome = ?: N (0.0)
| Customerage = 40-60: Y (6.0)
| Customerage = ?: Y (2.0)
| Customerage = 60+: N (0.0)
| Customerage = 25-: N (0.0)
Children = 3.0
| Purchasefrequency = Severaltimesayear: N (2.0)
| Purchasefrequency = Onceamonth: Y (2.0)
| Purchasefrequency = 2-3month: N (6.0)
| Purchasefrequency = ?: Y (2.0)
| Purchasefrequency = Justonce: N (0.0)
| Purchasefrequency = +3month: N (0.0)

```

```

Children = 2.0
| Age = 25-40
| | FeelingsA = Happy
| | | Productcategory = Clothing
| | | | ShadowcolorB = ?: Y (2.0)
| | | | ShadowcolorB = Y: N (8.0)
| | | | ShadowcolorB = N
| | | | | Convenientdisplay = ?: N (0.0)
| | | | | Convenientdisplay = 5.0: Y (2.0)
| | | | | Convenientdisplay = 4.0: N (8.0)
| | | | | Convenientdisplay = 3.0: N (0.0)
| | | | Productcategory = Article: Y (10.0)
| | | | Productcategory = Both: Y (10.0)
| | | FeelingsA = ?: N (0.0)
| | | FeelingsA = Moody: N (4.0)
| | | FeelingsA = Busy: N (4.0)
| | | FeelingsA = Sad: N (0.0)
| | | FeelingsA = Stressed : N (2.0)
| Age = 40-60: N (18.0)
| Age = 25-: N (2.0)
| Age = 60+: Y (2.0)
| Age = ?: Y (2.0)
Children = ?: Y (10.0)
Children = 4.0: N (6.0)
Children = 0.0
| Headofthegroup = M: N (2.0)
| Headofthegroup = F
| | Averageprice <= 6000: Y (26.0)
| | Averageprice > 6000: N (2.0 )
| Headofthegroup = ?: Y (0.0)

```

Appendix C

CUSTOMER QUESTIONNAIRE

Invoice number : _____ (filled out by the clerk)

Date : Month _____ Day _____ Hour _____

1. Customer information			
1. Gender	☐ Masculine	☐ Feminine	
2. Are you pregnant? (if applicable)	☐ Yes	☐ No	
3. Number of children in your family	☐ 0	☐ 1 child	☐ 2 children ☐ 3 or more children
4. Marital status	☐ Married	☐ Single	
5. Age	☐ Under 25	☐ 25 ~ 40	☐ 40 ~ 60
	☐ Over 60		
6. Family income (NT)	☐ Under 30000	☐ 30000-60000	☐ 60000-90000
	☐ Over 90000		
7. Level of education	☐ High school or below	☐ University	☐ Above university
2. Purchase information			
Purpose of the purchase	☐ Change of season	☐ Festive holiday	☐ Children had outgrown clothes
	☐ New born	☐ Birthday	☐ Other _____
	☐ Pregnancy	☐ Gift	
3. Consumer behavior			
1. If you came to the store accompanied; who made the final purchase decision?			
	☐ Me	☐ Friend	☐ Mate
	☐ Kid	☐ Parent	
2. Was your shopping decision influenced by a clerk of our store?			
	☐ Yes	☐ No	
3. How much do you usually expend on the same kind of articles every time you make a purchase?			
	☐ 200-1000 NT	☐ 1000-2000 NT	☐ 2000-3000NT
	☐ Over 3000NT		
4. How often do you purchase in our stores? (Please consider the whole "Les Enphants" stores' chain)			
	☐ Once a month	☐ 2-3 times a month	☐ Above 3 times a month
	☐ Just once	☐ In one year _____ times	
5. When you purchase children clothing what do you care mostly about?			
	☐ Quality	☐ Style	☐ Trends
	☐ Price	☐ Easy care	☐ Brands
6. Can you find the products you are looking for in our stores?			
☐ Never	☐ Sometimes	☐ Usually	☐ Always

4. Customer experience quality

Please rate how strongly you agree or disagree with each of the following statements by circling the appropriate number

● The store has:					
	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
1. Fashionable displays					
2. Up-to-date merchandise					
3. Nice store atmosphere					
4. Convenient display of the merchandise					
5. Appealing promotional materials (to promote the brands and the items under discount)					

● The clerks in the store:					
	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
1. Know the merchandise's characteristics					
2. Are never too busy to respond your questions					
3. Are always willing to help					
4. Understand your specific needs					
5. Are courteous					

CLERK QUESTIONNAIRE

Invoice number : _____ (if it is a purchasing event, otherwise leave it empty)
(Please, consider that questions 4,7,9 and 11 are only applicable when the customer has purchased in the store.)

Date : Month _____ Day _____ Hour _____

1. How many customers came together to the store?

- | | |
|--|--|
| ☐ _____ Adult females | ☐ _____ Female children |
| ☐ _____ Adult males | ☐ _____ Male children |

2. Who was the head of the customer's group? Who made the final decision?

- | | |
|--|---|
| ☐ An adult female | ☐ A female child |
| ☐ An adult male | ☐ A male child |

3. Was the Customer's questionnaire filled out by the same person? (The leader of the customer's group of the previous question).

- | | |
|---|--|
| ☐ Yes, the same person | ☐ No, it was a different person |
|---|--|

4. Were the products purchased coherent? Were they similar?

- | | |
|--|---|
| ☐ Yes, in style | ☐ No, they weren't |
| ☐ Yes, in color | |
| ☐ Yes, they were identical (the same goods) | |

5. Did you help out the customer somehow?

- | |
|--|
| ☐ Yes, I showed the customer the store and its products |
| ☐ Yes, I answered some questions |
| ☐ No, the customer walked by himself |

6. When did you interact with the customer?

- | |
|---|
| ☐ As soon as he arrived |
| ☐ When he needed help |
| ☐ When he was looking for something specific |
| ☐ When he was browsing the store |

7. How would you describe the customer's shopping behavior?

- | |
|--|
| ☐ I influenced on the purchase |
| ☐ It was a purchase at first sight |
| ☐ The customer purchased the goods after a quick visit to the store |

Note: The following questions should focus on the leader of the customer's group (question 2)

8. When the customer just entered this store, how you could describe his mood?

- | | | |
|--------------------------------|-----------------------------------|------------------------------------|
| ☐ Happy | ☐ Moody | ☐ Busy |
| ☐ Sad | ☐ Stressed | ☐ Pensative |

9. When the customer was leaving the store, how you could you describe his mood?

- | | | |
|--------------------------------|-----------------------------------|------------------------------------|
| ☐ Happy | ☐ Moody | ☐ Busy |
| ☐ Sad | ☐ Stressed | ☐ Pensative |

10. Which colors was the customer wearing?

- | | | | |
|---------------------------------|--------------------------------|---------------------------------|---------------------------------|
| ☐ Red | ☐ Pink | ☐ Orange | ☐ Purple |
| ☐ Yellow | ☐ Green | ☐ Blue | ☐ Brown |
| ☐ Black | ☐ Grey | ☐ White | |

11. Which colors did the customer purchased? (The colors of the garments acquired.)

- | | | | |
|---------------------------------|--------------------------------|---------------------------------|---------------------------------|
| ☐ Red | ☐ Pink | ☐ Orange | ☐ Purple |
| ☐ Yellow | ☐ Green | ☐ Blue | ☐ Brown |
| ☐ Black | ☐ Grey | ☐ White | |

12. How old did the customer look like?

- | | | | |
|-----------------------------------|--------------------------------|--------------------------------|-----------------------------------|
| ☐ Under 25 | ☐ 25-40 | ☐ 40-60 | ☐ Above 60 |
|-----------------------------------|--------------------------------|--------------------------------|-----------------------------------|

13. How much time did the customer spend in the store?

- | |
|--|
| ☐ Approximately _____ minutes |
|--|
-

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