Abstract— How do organizations know they are designing products and services that their customers will value? This paper describes the initial results of the first four stages of a methodology for integrating customer Values in Experience design (ViEx). The theory of universal value structure was adapted to examine customer values in two contexts: online interaction (N=725) and shopping experience (N=742). The principle component analysis was used to identify the values structure in each context. The components represented persona dimensions and their relative order of importance characterized individual customers. The commonalities of the persona dimensions preferences were analyzed and customers were grouped by dimension preferences. Finally, the values-based persona descriptions were developed and complemented with demographic data and information from context-specific questions. The paper concludes with application of methodology to differentiation strategies in highly competitive business environments such as the cloud. The research also contributes to the discussion of values in context.

Keywords—values; methodology; experience; differentiation; cloud

I. INTRODUCTION

The cloud phenomenon is one of the main drivers of change in the ICT industry [5, 8]. It is a disrupting change that forces businesses to adjust their strategies [22]. The cloud sets context for researching organizational responses to external environment and advancing existing knowledge in methods for competing under uncertainty. This paper focuses on the differentiation strategies of software service providers, whose goal is to create a platform for supporting multiple offerings. Customer intelligence is part of building such a platform.

Cloud elasticity gives companies an opportunity to utilize economies of scale for setting zero or close-to-zero prices [2]. New pricing models – one of the key elements in reaching wide markets – become an industry standard and therefore reduce the range for price-based competition maneuvers. Companies, which successfully implement zero or close-to-zero prices, still face the need to differentiate their services from other free offers on the market. Other companies may choose to focus primarily on differentiation at the outset. In either case, short software development cycles, standardization and the reuse of product elements for deployment of services “on-demand” change the nature of ICT competition. Companies turn to the idea of customer experience as a way to win the audience and differentiate their businesses from those of competitors.

But how can an organization be certain that the experience it wants to create will attract customers? What are the implications of designing for experience for existing processes? Usually the first question is dealt with by some form of customer needs research. But in the dynamic and uncertain ICT environment customer needs are fluid and unstable. Customers may lack a frame of reference for what the future might look like and how their needs could be met effectively. Therefore traditional research of customer needs is likely to be incomplete for creating a differentiating experience. On the other hand, human values are known to be more stable, during even dramatic historic events [24]. Knowledge about customer values provides a stable and different platform for experience development. Sirotkin and McCabe [30] suggested that the differentiation strategy in the cloud should focus on designing experience, which must center on customer values.

The value in the experience design (ViEx) methodology objective is to provide practical answers to the second question. It is an on-going project in the development of new cloud services. This paper describes the first four (of six) stages. These stages are conclusive and can be used in isolation for improving organizational knowledge about potential and current audiences. ViEx methodology is particularly applicable to businesses that operate in an environment of high uncertainty and competition such as propelled by the cloud. One of the main research objectives is designing experiences, based on understanding customers’
values in a specific context. For this purpose we conducted two surveys. The first survey probed for customer values in online interaction context, while the second one focused on shopping experience.

The rest of the paper is structured in the following way: First, we define values and their role in experience design. Second, the ViEx methodology is outlined. We explain how the Schwartz value survey (SVS) was adapted for the two contexts of interest. Third, we describe how ViEx methodology was applied in two studies of customer values. Particularly this section discusses the creation of the persona dimensions and the analysis of their patterns. Finally we explain how compelling persona descriptions were developed by combining value-based personas with demographic and context specific information. The paper concludes by discussing the application of methodology in experience design and marketing strategy.

II. THEORETICAL BACKGROUND: VALUES AND EXPERIENCE DESIGN

Values frame all levels of human activities. They operate both at the individual and social levels [23] as well as cultural and country levels [26]. Thus a research of values can help identify the interconnections among all three spheres of human life [12]. By studying customer values, companies can understand links between their offerings, customer experiences and customers’ choices. The insights from such a research can contribute to experience design policies and, consequently, provide a new context for differentiation that will attract customers’ attention.

Despite a wide accepted belief that values are subjective and culturally or individually “arbitrary”, there are evidences that values are universal [3, 23, 27]. Proposing a general rational values theory, Boudon [3] summarizes values universality: “people have the impression, not less today than yesterday, that … the values they endorse, far from being private or from being mere emanations of particular cultures, can be considered as objectively valid” [3, p. 74]. Thus values transcend situations [23] and are not object-bound [32].

One of the properties of universality of values is context-specificity: the meaning of values and their interpretation varies under different circumstances [3, 19, 25, 29]. Their relative order of importance is conditioned by the situation [25, 29]. In other words, people are likely to report different value preferences when they think of a specific situation rather than when they are detached from any context [13, 15].

Although philosophers and sociologists debate what values are, in general they agree that the assessment of something as valuable relates to human values through the valuation process. Valuation is a process of recognizing that something is good or bad. Recognition of something as being good or bad, fair, desirable, etc. also means constructing implicit or explicit reasons for believing so. Implicit or explicit valuation can correspond to real or unreal, abstract or specific objects. When people value something and hold it as both ideal and general (i.e. not tied to any specific object or situation), such things become representations of their beliefs and are called values [23]. Values, in turn, serve as criteria for what is desirable. That is, values correspond to desirable ideal states or conditions and help people assess whether such conditions are attained. To have a value means to have a desire for it to be realized. A realized value of honesty, for example, would mean that the idealized desire for people to be sincere and free of deceit are matched by conditions in the actual world.

With the help of values people make judgments of what is desirable or expected versus what is experienced. Values give meaning to reality, serve as basis for arguments and are means for attributing causality [32]. Values serve as the guiding principles of the individuals’ lives [23, 27]. Homer and Kahle [13] showed that values play an important role in understanding customer attitudes and behavior. Understanding the customers’ values provides an insight into why people choose certain services or service providers. Lages and Fernandes [16] demonstrate the role of values in service evaluation.

If companies provide products and services that create experiences for customers [6, 21] and customers are guided by their values in experience valuation, then understanding customer values is an important element of the product, service and experience designs. On the other hand the theory of universality of values provides a base for hypothesizing that a study of values preferences in different contexts can be a common ground for designing experiences across different cultures and regions. Thus the Values in Experience design (ViEx) methodology was developed as a practical application of this reasoning.

Channeled into software development, knowledge of human values can help ICT companies create a platform for designing various personal and social experiences. Such integration of values requires understanding of customer value structures in a specific context. It is not enough to map finished product attributes to customer values; values need to be a part of the designing process from the conceptualization stage [30]. Clark and Fujimoto [6] suggest that customers buy values and experiences not products attributes. If this is a valid statement then experience design should be values focused rather than technology focused. This means values need to be selected and experiences targeted proactively.

Differentiation by experience is providing uniqueness, which customers perceive and value. A distinct characteristic of differentiation by experience is the opportunity for the users to engage with the service and construct their own experience [21]. The product that a customer gets is what he or she creates in partnership with the company. This is different from customization or user-centered design, which employs methods for producing for identified consumer needs and then adapting it to specific requirements. Experience is not produced by an enterprise, nor is it created by customer alone. It is co-constructed by both, in an environment which can be loosely demarcated with values. Experience “recognizes in its primary integrity no division between act and material, subject and object, but contains them both in an unanalyzed totality” [7]. Thus customer experience cannot be produced by an organization alone, nor should it be left to just happen. Rather experiences need to be
understood and constructed when an offering (object) is interpreted and consumed by customers (subjects).

The definitive property of the experience design is its intentionality. Pine and Gilmore [21] argued that the intentional staging of experience is one of the prerequisites for an experience to occur. We build on their argument suggesting that human values integrated into development processes enable intentionality. That is, values help outline intended customer experience and serve as a vector in designing for that experience.

III. INTEGRATING VALUES IN EXPERIENCE DESIGN

Experience is a non-functional property of product or service design but it is crucial to consider experience at the very beginning of the development process. This is because experiences can uphold or damage the realization of values. For example the embedded values approach in computer ethics, initially proposed by Helen Nissenbaum [20] upholds that technology is not neutral with respect to consequences of its use. Friedman and Kahn say, “technological innovations implicate human values” [11, p. 1242]. Technology carries propensity to support or discourage the realization of particular human values. This means that if relevant values are not intentionally set forth in software development, designers will work with assumptions. It is likely that a product will reflect a combination of the creators’ individual values [4, 10], values of other people who have significant influence over system development and value categories of organizational, cultural and societal context [4].

Friedman and Kahn [11] discuss the approaches for incorporating values in design. The approaches – computer ethics, social informatics, computer-supported cooperative work, participatory design, value sensitive design, values in marketing – overlap with each other to some extent but often differ in epistemological and methodological positions. They provide the basis for understanding how values and design are interrelated.

A. Contribution of ViEx methodology

Unlike other methods that focus on integrating specific values (e.g. autonomy, privacy) into product or service functionality, values in experience methodology aims at integrating values as systems into dynamic development process. This is a different perspective that takes business processes beyond studying independent and singular values to interpretation of interrelated structures of values. ViEx’s primary objective is to build a business platform for supporting the design of multiple customer experiences. ViEx provides a way to integrate people’s value structures in to design processes. Thus the method concentrates on the business aspect of experience rather than technology ethical import. It is a data-driven method which helps to minimize assumptions about values. It also minimizes the need for philosophical, psychological and sociological knowledge of values and hands the process of value integration over to business managers and software specialists. This is different from other methods, which include a stage for philosophical and sociological conceptualization of values. Finally ViEx is a forward-looking method in building differentiation strategies. It allows managers and designers to make decisions regarding values before the service is designed. In a way it simulates customer feedback at the beginning of experience design.

The Human values theory has been applied to consumer studies, for example in adoption of new technology [14], construction management [18] or consumer products [9] (see Kropp, Lavack and Silvera [15], for brief summary of values in consumer behavior studies). Many times implications for business policies are made based on observed correlations between values and consumer preferences. Correlation of values with behavior of interest reveals the general principle of how consumers perceive and make judgments of their experiences. Such findings are important for decision making and their practical application should be researched further. However, when the respondents are surveyed about their values in general, they are detached from the context. Thus the analysis of values without the respondents’ understanding of the context is incomplete because – although the content of values (motivational orientations) is universal [24, 26] – the structure of values changes depending on the context [25, 32].

The ViEx method does not account for all determinants of value structure but it includes the context of values from the beginning. We suggest that the inclusion of context into values surveys leads to better inferences. It is expected that surveying values in context will produce different and specific value systems that can be utilized in experience design.

Finally in addition to values ViEx makes use of demographics data and the information about how respondents experience existing services as well as their future preferences. Such an approach provides rich information for managers and designers.

ViEx consists of six stages: (1) Survey of values in a specific context, (2) Values structure analysis, (3) Clustering patterns of values structures, (4) Developing persona descriptions, (5) Integrating values and personas into software design and marketing, and (6) Evaluating results and customer perceptions.

B. Adaptation of Schwartz values survey

Schwartz’ imperially categorized values in interrelated orders in a multidimensional space [27]. He suggested a universal values theory, which provides theoretical grounds for ViEx’ central aim: to integrate systems of values into experience design. Schwartz [26, 27, 28] builds on a limited set of values proposed by Rokeach [23]. He maintains that values represent a universal language that people in all countries and cultures understand in the same way. The universality of values stems from common biological requirements for survival, social demands for interaction and support of group welfare.

Schwartz conducted an extensive empirical research that evidences that values form a structure of 11 basic motivational goals. His survey of 56 values was validated by tens of thousands of people across several dozens of countries, ranging from developed to undeveloped
economies. We adapted the Schwartz values survey for ViEx purposes and specific business needs, building on the notion that shared universal values are prioritized differently depending on a context and individual’s unique experiences.

The value theory allows for modifications specific to the study area [28]. Searing [31] had to adjust the explanations of the values in the Rokeach value survey to make them appropriate for British parliament MPs, whose understanding of values was more complex. Flanagan, Howe and Nissenbaum [10] emphasized the need for understanding values that are relevant in the design context. Values used in ViEx do not have to be limited to values used in the Schwartz survey. The list of values in ViEx represents an experiment for building a platform for designing experiences. It is important to not only define context for values but also include relevant values. The main modifications of the ViEx survey as compared to the Schwartz values survey are discussed below.

Spiritual life and detachment values of spirituality value category were excluded because it is likely that they do not represent universal values and are represented by other values [25]. The other two values (meaning in life and inner harmony) from that category were included in the survey. Honoring of parents and elders (showing respect) was modified to respect of others (honoring of others). The value obedient (dutiful, meeting obligations) was replaced with professional (meeting obligations). A varied life (filled with challenge, novelty, and change) was replaced with innovation (novelty, challenge and change).

Self-development and knowledge seeking can be a guiding principle for desired experiences, including online interaction and shopping. Therefore learning (seeking knowledge) was added to the survey. The value of privacy (intrusion free) was added to the survey because of its relevance to a broad range of design issues [11]. The final version contained 55 personal values. The respondents rated values on an eight-point scale of: lowest importance (1), unlabeled (2, 3, 4, 5, 6), highest importance (7), and not applicable. Likert type scales allows for more flexibility as opposed to ranking measurement because the Likert approach permits one to identify values that may be equally important in the context and does not force respondents to rank them [25]. For experience design purposes it is necessary to know which values are similarly important for customers’ experience.

Since values are cognitive representations of desirable, we did not expect that many respondents would indicate that a particular value was opposed to their values. Thus the scale did not include “opposed to my values” (-1) category. The practical objective of the survey demanded understanding whether people perceive a given value as applicable to their experience. Therefore “opposed to my values” was replaced with “not applicable”, as a consequence this provided two additional advantages. At the early stages of conceptualizing the experience designer can either ignore values that are perceived as irrelevant or they may use those values to innovate. We assumed that “not applicable” category would indicate that respondents might lack a reference framework for how such values could be attended to in an experience, thus giving designers an opportunity to generate innovative solutions.

C. Data collection and overview

Two separate online surveys were performed to collect the data. While the list of values was the same in both surveys, each study set different contexts for values by instructing respondents to think of different experiences.

The first survey focused on studying online interaction experience and instructed respondents in the following manner: “We all make judgments about the experiences we have. We would like you to think about your experiences with online interaction (with PCs, laptops, and mobiles, etc.) and, in particular, when it is for your personal use. Please rate how important the following factors are for judging this experience”. The list of values was broken down into three sections. Every new page repeated the instructions.

The first survey was conducted in Finland, Sweden, Italy, France, Germany and Brazil in May 2011. A software service provider ordered the study of values and selected the countries based on the current and potential target market interests. A predefinition for the sample was that only those respondents who or whose family had a broadband internet connection could complete the survey. The sample size was five hundred respondents in each country, thus, the overall sample size was 3000 responses. In this paper only Finnish and Swedish samples are used.

The second survey probed for customer values in the context of shopping experience. The values section had the following instructions: “We all make judgments about the experiences we have. We would like you to think about your shopping experience. Please rate how important the following factors are for judging shopping experience”. Similarly to the first survey values were partitioned into three lists of 20 values each starting with the instructions. Data for the second study was collected with an online survey conducted in Sweden and Finland in September 2011. The total number of responses was 1013 (513 in Finland and 500 in Sweden).

In both surveys respondents were dropped before the analysis if they had used any response more than 38 times, or used response 7 (totally agree) more than 23 times in the value survey. Although Likert scale lets the respondents identify equally important values and does not force them to rank the values, it was assumed that the respondents who did not meet the above criteria failed to make a sufficient effort answering the survey. Such reasoning was borrowed from Schwartz’ [27] previous analysis. As a result, in the online interaction survey 26.7 per cent of Finnish and 29.0 per cent of Swedish respondents were excluded from the analysis. In the shopping experience survey 26.1 per cent of Finnish and 27.4 per cent of Swedish respondents were dropped from the samples. The remaining samples contained altogether 725 and 742 respondents in online interaction and shopping experience surveys respectively. The table below describes the sample data by country.
Narration can foster analysis of customer values structures that should become central in design or marketing processes.

### D. Persona dimensions: Analysing the structure of values

In both samples we applied factor analysis as a way to detect the structure of values. The analysis was performed in SPSS using a principal component method with the varimax rotation technique.

For online interaction context the eight extracted components accounted for 64.8 per cent of the total variance (KMO – 0.960, Bartlett’s Test of Sphericity – 0.000). We concluded that the relationships among variables were strong and therefore proceeded with factor analysis. Cronbach’s alpha for generated components ranged from 0.792 to 0.945.

In shopping experience survey eleven components were generated (KMO – 0.942, Bartlett’s Test of Sphericity – 0.000). Cronbach’s alpha ranged between 0.629 and 0.870.

The loadings less than 0.3 were suppressed and were not visible in the rotated component matrixes. Even with this setting some values loaded on several components. This is due to the fact that values strongly correlate among each other. Values, whose weight was less than 0.5 on any give component or values that loaded on more than three components, were not included in the final value structure. Correlation of variables was expected for several reasons. First, rating technique encourages positive correlations. Second, values are interrelated concepts and do not operate in isolation in the lives of individuals [27]. Finally, it is unlikely that responses would exhibit high variance because at the outset values represent what is desirable.

Each component represented a dimension of respondent’s value structure and was called a “persona dimension”. Collectively persona dimensions characterize a respondent’s value structure. The relative order of importance for each dimension is likely to be unique from person to person; thus a customer could be profiled by his or her structure of preferences across all the persona dimensions.

Analysis of values comprising each component helped us name each “persona dimension” in a way that would be meaningful for both management and designers. Schwartz [26, 27, 28] and Rokeach [23] explanation of values were used to make a narrative description of all the persona dimensions.

In experience design such descriptions can help professionals to visualize the customer and focus on the service attributes that best fit his or her expectations. In marketing descriptions are can be used to customize service attributes that best fit his or her expectations. In professionalse to visualize the customer and focus on the dimensions.

### TABLE I. Samples description by country

<table>
<thead>
<tr>
<th>Value context</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online interaction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finland</td>
<td>370</td>
<td>51.0</td>
</tr>
<tr>
<td>Sweden</td>
<td>355</td>
<td>49.0</td>
</tr>
<tr>
<td>Total</td>
<td>725</td>
<td>100.0</td>
</tr>
<tr>
<td>Shopping experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finland</td>
<td>379</td>
<td>51.1</td>
</tr>
<tr>
<td>Sweden</td>
<td>363</td>
<td>48.9</td>
</tr>
<tr>
<td>Total</td>
<td>742</td>
<td>100.0</td>
</tr>
</tbody>
</table>

E. Personas: clustering analysis for value structure preferences

Clustering analysis was performed to identify groups of respondents that hold similar persona dimension preferences. The patterns of these preferences were determined with the k-means clustering method. Essentially, k-means is one of the most widely adopted clustering analysis techniques aimed at partitioning an n-sized set of d-dimensional sampled observations from a given population into k groups under a certain criteria. Such partitioning may yield disjoint clusters, or may allow for a certain overlapping between nearby clusters (coining what is referred to as fuzzy clustering). The non-fuzzy k-means approach in this study computes the clusters and assigns the observations to them by minimizing the sum, over all clusters, of the within-cluster sums of point-to-cluster-centroid distances. In this context, “centroid” stands for the arithmetic mean of all points within the corresponding cluster, whereas the “distance” function between d-dimensional observations can be arbitrarily defined provided that it fulfills the required properties of symmetry and triangle inequality.

To be specific, in this work the sum of absolute differences (also known as L1 or city-block distance) was used, consequently the centroid of a given cluster results to be the component-wise median of its assigned points. In what relates to the computation of the clusters itself, the conventional Lloyd’s algorithm [17] has been implemented based on an initial set of k centroids uniformly drawn from the range of values that every component of the observations can take. The algorithm iteratively partitions the observations according to the Voronoi diagram generated by the centroids from the previous iteration, which are then recomputed as the centroids of the observations in the new partition. The procedure is deemed to converge once the assignments from observations to clusters do not change along iterations. Since the performance of this algorithm depends strongly on the random initialization of the centroids, 10 runs of this algorithm have been executed for every considered (survey, k) combination, from which the solution with best (lowest) within-cluster sum of point-to-centroid distances is declared as the final solution.

By using the above procedure, five (k=5) clusters were identified in the online interaction context survey and six (k=6) clusters were identified in shopping experience context survey. Fig. 1 illustrates clusters for online interaction sample. The horizontal axis includes eight persona dimensions, identified in the previous stage. The vertical axis is the scale of dimension’s relative importance. A cluster (persona) combines individuals with similar patterns of priorities. The central line on each of the five clusters averages dimension preferences of a group. Using this information we proceed to describe each persona by the nature of shared characteristics derived from a cluster’s central line, its shape combined with the knowledge about values and dimensions.
business objectives. It is therefore a relatively inexpensive approach to collecting data as it can be quickly reproduced for various different contexts. Thus ViEx is relatively simple and once the framework is implemented, the process remains constant and only the context question need change for new knowledge situations. This feature provides two additional benefits: one being that new surveys can be compared with old ones in an A-B comparison, thus providing the opportunity for new market knowledge. The other benefit is that repeating the same survey substantiates validity, a by-product of which can lead to continuous improvement. Thus ViEx is relatively simple and once applied it can be quickly reproduced for various different business objectives. It is therefore a relatively inexpensive way of creating representations of real people. The resulting persona dimensions and personas can be used as a base for qualitative studies of selected customer groups.

The narrative description of personas, which includes persona dimension patterns, value preferences, demographic data and context information, represent a concise and holistic definition of an audience. They are effective because they help designers, managers and other stakeholders focus on customer experience, which is described at a common sense level. Such descriptions help stakeholders relate to personas, interpret and apply them to experience design.

Understanding customer values in a context allows for focused strategy development. Companies that use contextual values studies to complement traditional marketing studies understand their customers better than those that use generic persona descriptions or traditional market segmentation. This is because imagination is required to visualize a generic persona in a specific context. Such assumptions are likely to be based on values of professional designers rather than customer values. Although imagination is part of the ViEx method, it steers stakeholders’ creative thinking in a common direction. Thus ViEx provides not only a share understanding of customers but also creates a common vision of customers in a specific context. This helps not only to produce agreement among stakeholders but also to bring congruence between designing processes and marketing messages.

Another advantage of using values in experience design is that they can be used in marketing and design workshops in various creative ways. Creative activities can ensure that the experience design is appealing to the target consumer. Descriptions of personas based on values and demographic data can bring to mind a person that designers and marketers may know. This makes the persona descriptions a compelling instrument, which helps envisioning a customer and his or her experience. Designing with future customer experience in mind is likely to be a powerful mind shift for an organization.

Currently the ViEx method begins with a customer survey. The methodology will benefit from research on how country specific personas could be extended to other countries without conducting an initial survey. This work would need to include analysis of probabilities of values belonging to one persona dimension across different countries.

IV. DISCUSSION

Compared with other persona development methods (e.g. [1]), the ViEx approach has several advantages. The first one is that it is based on values, which change relatively slowly in comparison to needs, attitudes and desires. Fundamentally this means that the knowledge gained has longevity in that surveys do not have to be repeated to follow market trends. Second, once the ViEx is implemented, the survey remains constant and only the context question need change for new knowledge situations. This feature provides two additional benefits: one being that new surveys can be compared with old ones in an A-B comparison, thus providing the opportunity for new market knowledge. The other benefit is that repeating the same survey substantiates validity, a by-product of which can lead to continuous improvement. Thus ViEx is relatively simple and once applied it can be quickly reproduced for various different business objectives. It is therefore a relatively inexpensive way of creating representations of real people. The resulting persona dimensions and personas can be used as a base for qualitative studies of selected customer groups.

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V. CONCLUSION

In this paper, we introduced a new methodology for integrating values in experience design (ViEx). ViEx takes a business perspective on experience design and is a data-driven method which helps to minimize the assumptions about values that can be used to guide experience design and frame differentiation strategy. The ViEx methodology includes six phases, four of them were presented in this paper. This research is an on-going project. The fifth stage of ViEx will include work with developers of new cloud service. A series of workshops will be conducted to understand how values and personas can be practically used in design. One of the outcomes of that stage will be a process
for interpreting and integrating persona values in experience design. The sixth and final stage will focus on customer perceptions of a final service. This stage will include the analysis of intended experiences versus perceived ones. It is expected that the sixth step will refine the ViEx method to be an effective tool in experience design.

The concept of service development for values is quickly spreading through the ICT industry. The ViEx methodology provides a way for managers to incorporate values in experience design ahead of competition.

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