

# Storytelling and a narrative analysis based method for extracting users' motives in UX design processes

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## Abstract

Users' emotions are crucial for purchasing decisions. Designing products that evoke positive emotions requires knowledge about users and their psychological needs: the research on User Experience (UX) aims at creating such knowledge. Several UX researchers highlighted that positive emotions emerge in user/product interactions, when user's psychological motives and needs are met and her/his expectations fulfilled or exceeded. How can users' motives be acquired? User research in industrial practice usually contributes with insights about users in form personas, user feedback and interviews, but not explicitly with the motives to be addressed. This work aims at creating a systematic method for deriving and understanding users' motives through the analysis of stories, such as those in product reviews. The identified motives can serve as input for UX design. Thus, basing of existing techniques for the narrative analysis of stories, a method for extracting users' motives is proposed and an exemplary application shown.

**Keywords:** *User experience, storytelling, users' motives, design methods*

## 1 Introduction

*Whenever a man does a thoroughly stupid thing, it is always from the noblest motives.* With this cutting sentence, Oscar Wilde seized one of the most salient aspects of human motives: they lead us to actions. Learning an instrument, reading a book, purchasing a pair of shoes to go running are examples of actions that can be motivated by psychological needs. For instance, one may learn an instrument to be able to play a serenade for his/her lover, or because it fosters self-expression. Furthermore, there can be several motives leading to a purchase. The importance of a real understanding of the motives underlying purchases has been underestimated in previous decades: according to den Ouden et al. [1], 48% of returned products do not violate product specifications, but end up being returned because they *didn't work as thought they would* (28%), or because of other reasons such as *No longer wanted*, or *Wanted a different one* (20% overall).

As the functional performance of a product is not a guarantee for its success, the necessity of addressing true users' needs has become in the last years more and more urgent. As a consequence, several models and frameworks have been proposed in order to represent the kaleidoscopic nuances that compose the User Experience (UX) [2, 3]. Among the others, in [4] the centrality of the satisfaction of users' psychological needs is stressed, considered to be the major source of positive experiences. However, users do not interact having in mind the urge for satisfying a need: indeed, one would not constantly work out at the gym for satisfying a need for stimulation [5]. Instead, she/he may have a wish of "being in a good shape", a so-called "be-goal" arising from said psychological need [2, 6, 7]. Be-goals constitute psychological motives that users seek to address, also through the interaction with artefacts. In reason of this, designers must clarify and keep the underlying be-goals in mind when designing [8]; thus, it becomes of primary relevance for companies to individuate them. A traditional approach adopted by companies for understanding users' needs consists of reducing the distance from their users: from this perspective, listening to the "Voice of the Customer" [9]. However, *customers don't know what they want in the future* [10], therefore, techniques allowing the understanding of veiled motives and needs are required.

Interviewers might probe for these higher-level motives, as in the laddering and means-ends techniques [9, 11]; nevertheless, these techniques present some limitations related to the high costs, the time consumed, as well as a certain dependency on the capabilities of the interviewer. According to Rosenthal and Capper [12], there is a growing awareness of the limits of the voice of customers as an essential support to product innovation decisions. This has led to new research-based techniques, e.g. ethnographic studies of consumers that provide insights on unarticulated needs. Helkkula and Pihlström [13] also argue that when designing new experiences, projective techniques, such as narrative inquire, are much more suitable for deriving tacit user knowledge than straightforward questioning techniques. Tacit knowledge refers to unspoken needs, is highly personal and hard to formalize, and it is deeply rooted in a person's actions and experience – thus hard to obtain through straightforward questioning techniques. Projective techniques have the potential to generate tacit information related to a customer experience that cannot be obtained through other means [14], while narratives, in particular, have the capability to convey tacit knowledge and customers' experiences [15]. However, also ethnographic approaches [12, 16] carry drawbacks related to costs, apprehensiveness of respondents, or also the need for skilled observers [17] and the access to right events [12]. Given the aforementioned limitations, the research question motivating this work is how can we systematically acquire and understand users' psychological motives? The aim of the study, hence, is the proposal of a systematic method for identifying and understanding users' psychological motives. As discussed in the remainder of the paper, the proposed method roots in storytelling and narrative analysis of stories. Therefore, following section provides a review of storytelling current practices and explains the reasons for adopting it as a basis for the method.

## 2 Storytelling

As argued in [18], if users' needs and motives are something that is missing, they will be difficult to see: needs appear as obvious only after they have been found. Hence, in [16] it is concluded that research that relies on the user's *description* of a situation may never uncover this need. However, descriptions differ from stories, as the latter have a plot: they can be defined as *sequence of events, experiences, or actions with a plot that ties together different parts into a meaningful whole* [19]. Therefore, as stories can reflect the interpretation of the storyteller on a certain subject, we argue that if the storyteller was the user, we can gather hints about her/his practices, ideas, and needs by analysing her/his stories. Hence next

paragraph describes storytelling and its current practices within industries, with a particular reference to the field of UX design.

## **2.1 Review about storytelling**

Storytelling is a technique used mainly to support communication and share knowledge. Its practice is common in many disciplines from management science for better organizational and knowledge management [20] to service design [13], product design and engineering [21, 22, 23] for user research, elicitation of requirements, visualization of concepts [24] and even marketing [25]. In UX design, in particular, stories provide a communication platform for all the stakeholders, from the interdisciplinary UX team to users and managers. Stories help designers to understand users' characteristics, tasks and equipment as well as the physical and social environment of interactions. They offer a way to visualize information in an understandable and memorable way; and even enable capturing emotional, temporal and contextual aspects of interactions. In [26], a special type of stories with UX related elements ("UX stories") is introduced: "*A UX story is a narration about a specific, aimed interaction of a character with a system in physical and emotional context, focusing on the characters' needs, motives and goals. Therefore, it enables a personal identification of the receiver with the story character*". Special characteristics of stories are the narration format and their specific and personal nature. A story is often about untypical – rather than typical or prototypical – situation. As suggested by Quesenbery and Brooks [24], stories can be applied during the whole design process to improve the UX quality of products, but also to support designers in exploring and communicating ideas. According to different possible audiences and design phases, stories evolve and can be presented in different levels of detail and formats. In addition to that, the practical advantages of its application, like no special knowledge or systems required for employing it, make storytelling a technique increasingly applied in both academia and industry.

## **2.2 Reasons why we adopted storytelling**

The first reason why we adopted storytelling for extracting users' motives is that stories are rich of insights. A story is personal and involves users' emotions and psychological aspects of interaction. Stories, as subjective reproduction of events, offer the possibility of "reading through the lines" and creating a better understanding of what users think and want. Furthermore, storytelling is based on natural language, so no previous knowledge or special systems are required for its application. In this way, interdisciplinary cooperation is enhanced and organizational effort and costs are reduced. Users' stories can be extracted from existing company data, e.g. from interviews or studies provided for user research, or from user feedback channels. Even if those data are not obtainable, stories can be collected in a rather effortless way: product reviews available online give a representative image of users' problems, opinions and wishes. Given the research problem and the aforementioned advantages, as well as the industrial relevance of storytelling, we argue that it could be exploited for extracting users' motives. It is assumed herein that, by reading through the lines of users' stories, it is possible to extract insights about elements not explicitly stated, such as users' psychological needs and motives. However, a systematic, repeatable method for analysing stories is needed. As done in [19], it is argued herein that narrative analysis could be employed in order to systematically analyze stories for turning into explicit some of the implicit elements intended by the storyteller. As the concern here is not with whether a certain argument *is right or wrong, or whether the events in question actually happened but, rather, with the understandings that the storyteller is expressing through the story* [19], a method for analysing stories should be able to reveal the concealed motives of the storyteller. Hence, next section describes the proposed method.

### 3 Methodology

In this section, a methodology for identifying psychological motives to be addressed by designers is outlined. The resulting method is based upon the work of Feldman et al. [19] and their rhetorical approach to narrative analysis, based on concepts derived from logic and semiotics.

#### 3.1 The method

The method exposed herein aims at providing designers with a systematic procedure for extracting users' psychological motives to be addressed by new product developments and re-design processes. The method, represented in Figure 1, is based on the analysis of stories, which can be found in product reviews and users' opinions to be collected (Step 0). In accordance to Feldman et al. [19], the analysis begins with the identification and extraction of stories from the collected material (Step 1). A general criterion for identifying stories is that they illustrate through specific exemplars: stories often act as exemplar, in that they can represent a concrete summation of ideas that may be difficult to articulate. The second step of the analysis is the definition of storylines, summarizing and describing the stories. Storylines, indeed, compel designers *to be very clear and concise about the arguments* in focus of the analysis. The storylines, however, should be related to the overarching theme of the analysis, as for example the use cases we are going to design for, or also the issue seemingly emerging from the story. Finding a storyline for each story can help to focus on certain problems encountered by the storytellers, but also their goals and needs.

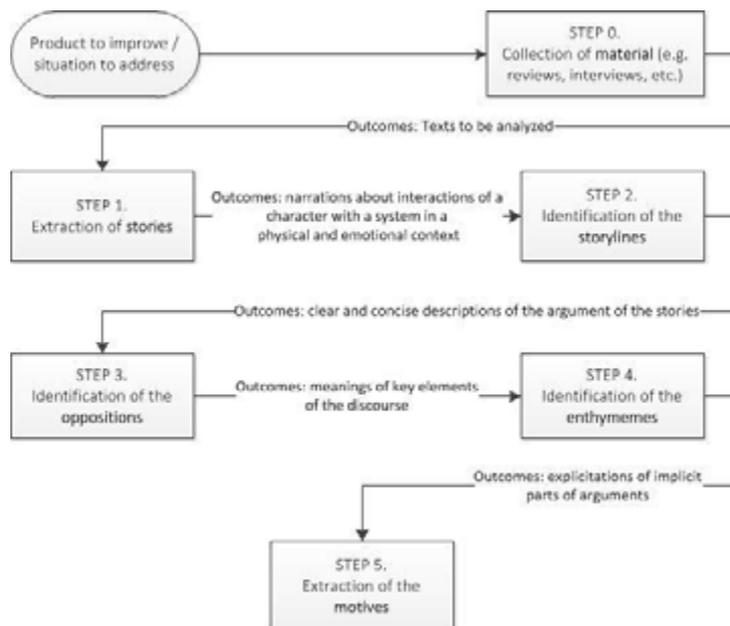


Figure 1. A graphical representation of the proposed method

The third step of the analysis consists in the identification of the oppositions, implicit or explicit. As *one way of creating meaning in discourse is through attention to opposites embedded in discourse* [19], then *looking for oppositions allows the researcher to uncover the meaning of a key element of the discourse by analysing what the narrator implies the element is not*. From the perspective of this study, by highlighting the opposite of the existing

situation, the designer can gather hints about the motives to address in the situation to-be. The fourth step involves the concept of the enthymeme, which is an incomplete logical inference. Taking the form of a syllogism, one of whose parts is missing, enthymemes provide the researcher with a tool to transform the implicit parts of the arguments into explicit and analysable data. In our opinion, the individuation of the enthymemes, following the contextualization offered by storylines and oppositions, can help to turn into explicit the implicit motives underlying users' stories with products: said motives, e.g. "feeling closer to a distant person", "being in a good shape", which are expressed in a -ing form in accordance with the be-goals discussed in [2, 7], constitute the final outcome of the method. This extraction, however, although being the last step, should be followed by a critical analysis of the findings. Therefore, next section shows in details an exemplary application of the method, whose outcomes are exposed and critically discussed, before the conclusions are drawn.

## 4 Case study

In order to conduct a preliminary demonstration of the method, we hypothesized a fictitious re-design of a product. More in detail, we individuated and selected a successful existing product, and sought opinions and reviews about it. Then, we applied the method described in the previous section, in order to extract the "be-goals" to be addressed in the re-design of the product. The selected product is a pair of shoes for barefoot running, and in particular the Nike Free Run 3.0, in their version 3. With the objective of identifying possible psychological motives to be addressed, we aimed at gathering a preliminary verification of the presented method in terms of capability to produce meaningful results. An important issue is the definition of the number of stories to be collected. As to our knowledge no studies linked the number of reviews to that of needs individuated, we based our decision upon the studies who linked the number of interviews to the percentage of needs elicited. In [9] it is reported that 20 interviews are sufficient to unveil about the 90% of user's needs. As argued in [27], 15 is the smallest acceptable sample size for a qualitative research. Given the scope of this work, i.e. a preliminary analysis, we collected 10 product reviews, out of which 22 stories were extracted. The length of the reviews varied between 15 sentences to a page and a half. The reviews were found in freely accessible websites; the collection process employed two of the authors and took one hour and a half. The length of stories, instead, ranged between 3 and 13 sentences. No target group was pre-defined; so there was no limitation in selecting reviews according to special characteristics of the reviewers.

### 4.1 The analysis of stories

The analysis of the reviews was conducted independently by two of the authors, before discussing and integrating the outcomes. This paragraph exposes an exemplary analysis, through which we are going to show the logic of the method. After having collected the reviews, those parts where the user describes specific situations through exemplars (i.e. stories) have to be highlighted. For instance, the one reported below is not a story, but rather a description:

*"The 3.0 are light enough to use for workouts like tempos, fartleks, hills. Pretty much anything that isn't really fast or requiring of quick turns. They would also be good as a beginner shoe in transitioning to minimalism. They still have a little bit of foam on the bottom and are far from zero-drop so your calves wouldn't take too much of a beating."*

Conversely, one of the stories extracted is reported as follows:

*“[...] one of the athletes, Anthony Sheppard, [...], echoed Polamalu's mentality. Standing only in socks, about to run into the cane fields, "Shoes... slow me down". Granted I'm not the athlete either of these two are, I'd like to think I am doing as much as I can to be as close their level. So one day while shopping, I come across Nike shoes that looked more suited to be rolled up than to support my feet. Upon trying them on however, I was quickly finding out something that our species has forgotten over the last century. We were built to run barefoot, or at least as close to barefoot as possible. I liked what I felt, quite a bit actually. After purchase I quickly went to break them in. Ten minutes later I was panting on the couch”*

As from Figure 1, the identification of the storyline is the next step to be performed. As in our interpretation this story is related with the concepts of improvement and performances, a suitable storyline here may be *“Barefoot eventually improves performances”*. The following step is the identification of the oppositions. In our interpretation of the reported story, concepts like *barefoot running*, *improvements* and *professional athlete's level* seem to contrast those of *traditional shoes*, *slowing down*, and *lack of improvements*. Hence, some oppositions could be those between *barefoot* and *standard shoes*, *improvement* and *lack of progress*, *professional athletes* and *common men*. With regard to the elicitation of the enthymemes, for the selected story, two syllogisms allowing us to reveal the underlying logic according to the storyteller may be:

- *I'm not a professional athlete. I aim at reaching their level. Therefore I'm doing as much as I can to be as close to their level.*
- *Reaching the pros' level requires improvements. Standard shoes slow my improvements down. Therefore, I cannot reach them by using standard shoes.*

In the first enthymeme, the major premise and the conclusion were expressed by the storyteller, even though with different words; in the second one the conclusion instead was missing. The motives arise as an interpretative result of the data collected through the process; it emerged that the user aims at reaching the pros level, and it cannot reach it by using standard shoes. Therefore, a shoe supporting and stimulating users' improvement could fulfil her/his be-goal of *being like a pro*.

Another example involves one among the most salient aspects found in the analysed stories, related to injuries. Indeed, a user wrote sentences like *“for over thirty years I've been buying heavy motion control shoes but still had periodic knee or hip pain”*. Others linked the running experience to *“the angst of the already dreadful activity”* and also to the *“fear of cardiac arrest”*. Thanks to oppositions such as *past vs present*, *expectations vs outcomes*, or *fear vs relief*, we came up with enthymemes such as: *I've been running for many years. I've always had periodic hip or pain. Therefore running leads to pain*. This led us to the understanding that it is not enough to provide users with shoes that do not hurt. They should be reassured that the running experience is not leading to bad consequences: in other words, they should *get rid of fear*. From the satisfaction of this overarching motive, different users can find a benefit: from the pronator who feels hip or knee pain, to the heavy weighted guy who eventually decided to change the shoes used for his workouts, as well as the users who wanted to improve but did not increase the toughness of his training for fear of serious damages.

The analysis process lasted approximately 6 hours distributed among 3 days. 38 oppositions and 25 enthymemes were collected. The major premise was missing 14 times; minor premises and conclusions were missing respectively 7 and 8 times. The process was iterative, in that iterations can help to clarify further aspects and reveal other motives. Eventually, 21

psychological motives to be potentially addressed were identified and clustered according to their similarities: from this perspective, we found oppositions a valuable tool for categorizing motives according to their meaning. This final stage led to a further refinement in both the words used in naming the cluster, but also led to further clustering. We critically discussed about each of the motives, in order to see if they fitted the original sentences in the stories and if they could actually address the issues raised by the storytellers. Table 1 shows the clusters of psychological motives highlighted from the overall process. These motives can eventually serve as input for design processes of new artefacts features and functionalities aimed at enhancing user experiences with products.

Table 1 Results of the analysis, in terms of clustered psychological motives

|  |
|--|
| <b>Feeling like having no shoes</b><br>(e.g. feeling natural, feeling like having grass under the feet, feeling barefoot and protected)  |
| <b>Getting rid of fear</b><br>(e.g. being reassured that the running experience is not going to hurt in spite of the foot type, the weight, the type of exercise)  |
| <b>Being immersed in the running experiences</b><br>(e.g. being capable of focusing on the workout, without thinking about fear, or about shoes attracting pebbles, having fun, being capable of feeling the flexure of the foot,) |
| <b>Being stimulated in improving</b><br>(e.g. being able to do difficult exercises, being stimulated in reaching the level of professional athletes)   |
| <b>Being provided with a healthier life-style</b><br>(e.g. being in a good shape, being provided with a healthier mentality)   |
| <b>Being “fashion” with running shoes</b><br>(e.g. being cool-looking running shoes, having shoes appropriate for different outfits)   |
| <b>Being “unstoppable” although barefoot</b><br>(e.g. being capable of doing extreme training, training on different terrains, training during winter with barefoot shoes, without damaging the shoes)                             |

#### 4.2 Preliminary validation

In order to get a first assessment of our results, a preliminary validation was conducted. We asked one of the authors, who did not run the analysis, as well as another researcher in the field of UX design, to read through the collected stories and individuate the psychological motives. The number of motives extracted seems to be comparable: in one case 19 motives were individuated (compared to the 21 we found), whereas in the other case the motives provided to us were already clustered into 7 groups (our same number). With regard to the differences among the meanings and the domains of motives, all of the motives highlighted without the method had emerged in our analysis, with the exception of a single one (i.e. I want a shoe that is made for my own body). On the contrary, both the analyses run without the method generated a narrower spectrum of psychological motives. For instance, they overlooked the aspects related to “Being immersed in the running experience”, as well as to the one called “Being “unstoppable” although barefoot”.

This leads to the dimension where the proposed method seems to offer the major advantages, which is the depth of understanding of the extracted motives. Indeed, even where the outcomes retrieved without the method concerned similar motives, they presented a less rich characterization than those collected with the aid of the method. If we consider the example related to the pain issue, discussed in the previous paragraph, motives such as “I want to avoid

stress/effort of my feet” or “I want to avoid injuries” were achieved without the aid of the method. Although being relevant, said outcomes seem to be more similar to functional requirements than to psychological motives. By means of an analysis of the opposition and of the enthymemes discussed in the second example of previous paragraph, the consciousness that users should be reassured emerged. In our opinion, this may not only lead to a better formulation of the issues to be solved by new product developments, but can eventually help in finding more appealing solutions for addressing users’ needs. With reference to time consumption, the proposed method does not generate a time-saving with respect to the not guided processes (which lasted, respectively, 40 minutes and 2 hours). However, the higher time required was in part explainable by the first-time application, the fine tuning performed on the method itself during the analysis and the final iterations and discussions among the researchers; on the contrary, the not guided analyses were performed by single individuals. Nonetheless, the higher time demand seems to be justified by the deeper understanding provided. However, a more comprehensive discussion about the advantages and the limitations of the proposed model can be found in the following and final paragraph.

## 5 Discussion and conclusion

In this work, we have proposed a method for extracting psychological motives of the users through the narrative analysis of their stories with products. It has been shown that this method provides designers with a systematic procedure for gathering information about users’ motives, whose comprehension would be more difficult without such an aid. In our opinion, this method presents the following advantages. Firstly, it not only provides designer with a comprehensive set of psychological motives to be addressed, but it does also offer an in-depth understanding of said motives. This is mainly due to the rich sources of information offered by stories, which often carry implicit meanings. Storytellers naturally omit certain information, such as what they consider taken-for-granted facts. As Feldman et al. [19] put it, looking for the implicit messages within the story opens up valuable, but sometimes overlooked issues, opinions, or motivations that enable the researcher to go beyond the words contained in the text. The selection of users stories in form of product reviews roots in the advantages of this approach: not only they are real opinions usually exposed with emphasis on positive or negative aspects, but their collection is also time- and cost-effective. Furthermore, the method results with being quite easy to use, even though it may require some practice at the beginning. Finally, it is very little money and time consuming, if compared to those methods based on interviews [9]. Another advantage offered by narrative analysis is that it avoids information losses due to the translation of users’ opinions into rigid technical requirements, as for instance it can happen in approaches like QFD [28] and Kansei engineering [29]. Indeed, being based on users’ (indirect) participation through their stories, it employs users’ input as-is, in a natural language form.

This method, however, presents some limitations. First of all, it is based on an interpretative process; therefore, its results are dependent on the sensitivity of the researcher(s) performing the analysis. This issue can be particularly relevant in the stage related to the identification of the storyline. If on the hand, as Feldman et al. put it, *one can expose implicit understandings in narrative, reason, or representational practices, without also claiming that this is the only way to interpret a narrative* [19], on the other hand this may lead to overlook some motives due to biases. Therefore, investigations could be made about the relations between the number of researchers and the quantity of motives highlighted, in order to reduce to a minimum the subjectivity issue. The same type of investigation should provide information also on the number of reviews to be analysed: 10 reviews can be a sufficient number for an exemplary application. Nonetheless, a real application should probably collect more sources.

Furthermore, the present study has provided only a preliminary validation, which is not meant to be a replacement for a more comprehensive one. Finally, the adoption of product reviews as a source present some limitations: not only information is less rich than that achievable through interviews and ethnographic observations, but the use of reviews can also introduce biases due to the sampling of anonymous material retrieved on publicly accessible websites.

Nevertheless, small and medium enterprises that do not have departments devoted to gather marketing and user insights, and that usually base their product developments on their “feel for the market” may obtain significant benefits. These benefits could become more relevant with further developments, such as the definition of a platform for performing the analysis, and a template for translating the outcomes of the method into stories, to be told to companies for sharing the results and present them in an understandable form. Still, integration with personas [30] may help give further clarity to both stories and outcomes of the analyses. Finally, as already mentioned a complete validation is mandatory. In conclusion, this work outlines a systematic approach to derive users’ psychological motives for product usage from raw data provided by user research. This method also supports designers in creating an in-depth understanding of users’ psychological motives. Said motives are crucial input for designing better UX, but current practices do not support their extraction: without a systematic approach, important data regarding users and their motives can be neglected in further design phases. The proposed approach exploits the benefits of storytelling, resulting in a pragmatic and applicable method for industrial practice.

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