



When Good Things Happen to Bad Products: Where are the Benefits of Usability in the Consumer Appliance Market?

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Consider the following three stories about usability and consumer appliances.

- A cellular phone with significant usability problems was launched. Still, the product was a great sales success and many users even seemed to have enjoyed using the product.
- A new generation game device was developed. It had usability problems that led to wide-spread user dissatisfaction and the reputation of the product was severely damaged.
- Some users of a new generation smart phone were happy with the product while others rejected it, finding its usability problems intolerable.

In some of these cases usability problems impacted negatively on customer satisfaction and business success, while in other cases they did not. How do we explain this, especially the market success of products with usability problems? We in the user-centered design (UCD) profession tend to promote usability by arguing that it improves products, is necessary for consumer satisfaction, and thus should improve sales. How do we account for cases in which customer satisfaction and sales do not seem to depend on usability?

A traditional way of making the business case for usability is cost justification and return-on-investment (ROI) [1]. In the consumer-products business, good usability can provide cost benefits such as training and support savings to both the manufacturer and the distributor. The manufacturer and distributors may also benefit from the reduced need for giving guidance or support to consumers.

Cost-benefits such as these, however, are not necessarily meaningful to consumers. It is not plausible to think that consumers would calculate costs when using a consumer appliance. Indeed, the influence of usability on consumer purchasing is less direct, and has not been well-conceptualized in our field. In this column, I discuss some ways to think about how usability impacts customer behavior and thereby increases business success.

Usability is Invisible in Purchasing Situations

Consider a situation when a consumer walks into a store to buy a consumer product such as a mobile phone, without any prior knowledge of the particular product. The purchase decision in cases like this is based on easily recognizable factors such as price, brand, features, and industrial design. Usability is not a decision factor in such a purchasing situation because *usability can be experienced only by using a product in real life*. And this is not feasible within the short time frame of the purchasing decision. Certainly, the press may comment on usability, but this is very rarely based on systematic or deep evaluation. Superficial commentary about usability also

occurs in the press soon after product introduction, long before the mass of consumers have had a chance to deeply evaluate usability through personal experience.

Users may form impressions of usability by briefly examining the product. A complex-looking user interface, such as a remote control with 80 or more buttons and tiny text, may give the shopper an impression that the device is hard to use. Similarly, a simple-looking user interface on a cellular phone does not mean good usability. In both cases, it is not practically feasible to validate *good* usability just by looking and examining the product.

I remember my own experience in buying a coffee maker for our office—a very simple machine. I based my selection mainly on the fact that the brand was well-known, respected, and that it was the most expensive, which created an expectation that the machine would be more durable than the others. Usability problems did not become apparent until after the machine was put into use. Many of us in the office forgot to put the manual switch of the filter in the “open” position which resulted in water overflowing onto the table. Preparing coffee with this device involved many steps, such as removing, cleaning, and restoring components after each use. As obvious as these problems were in hindsight, they were not evident during the purchase process, and therefore had no influence on my purchase decision.

It seems that usability may not even enter a consumer’s mind in a purchasing situation—even if the consumer happens to be a usability professional like myself. When reflecting on

my coffee-maker purchase, I realized that I was not thinking about usability at the time. Later, when it came time to purchase a digital camera, I recalled my profession in user-centered design, and discussed usability with the sales person. We both agreed that it is practically impossible to get a real sense of the full functionality of a camera before buying and using it. I had to make the purchase decision without a *real* experience of the camera. More recently, I needed to buy a DVD player for my home; again, my own profession escaped me and I made a purchase without usability in mind.

It is not easy for a consumer to evaluate usability in a walk-in setting. At best, it is usually only possible to practice some basic tasks with a device. It is a challenge to systematically identify the important tasks and test them all. Of course, if you do not handle the product at all, such as the case in online purchases, it is even more difficult to evaluate usability. Failing even one important task may lead a user to dissatisfaction. When purchasing my camera I considered making a checklist of the important user tasks. But I felt that I was not capable—and perhaps too lazy—to do that by myself. I just did not bother to systematically think of all the tasks that I would do with a digital camera in different situations. Moreover, I supposed such a list would become impractically long.

The other problem for a consumer is constructing a realistic test setting. For example, how does one test the phone book of a cellular phone with hundreds of names, or switch between two calls? How does one manage hundreds of pictures on a digital camera? The

usability problems with the coffee maker were revealed only after actually making coffee several times by different people.

From discussions with many colleagues, including other usability professionals, it seems that my experience is not unusual. If this is a general pattern, it would appear that consumers simply cannot make good purchasing decisions without some prior knowledge or information about the product.

Usability Problems Impact Customer Satisfaction and Product Reputation

The situation, however, is different if the product or brand has a reputation—either good or bad—and the consumer has heard of it. The impact of usability is more immediate when the reputation of a product is at stake, such as a game device where word travels fast, and customer dissatisfaction means certain loss of business to the manufacturer.

While I am adequately happy with my digital camera and DVD player, this does not mean that the products are free of usability flaws. I still cannot use all of the features and I am not totally happy with the use experience. However, since I am not entirely dissatisfied, I do not add negative feedback to the mix; but nor do I promote these products to others. Basically I don't discuss them at all.

On the other hand, because my dissatisfaction with the coffee maker was so great (even if it had some good qualities) I was inspired to use it as an example of a product with usability problems in my courses and presentations. The product's reputation has

surely suffered from my discussing my bad experience.

A couple of years ago I had the opportunity to get a smart phone, which combined a phone and a PDA. At first I was excited about the idea that I could combine two devices into one. My use experience, however, led to a remarkable dissatisfaction. I was accustomed to touch typing with my old PDA. The keypad of the new device, however, was not ergonomically designed for touch typing. I perceived the usability of the keypad of the new device as intolerable and unusable and after one week, I gave it away. What should concern the manufacturer is that I frequently discussed my dissatisfaction with the product among my friends and colleagues.

The point of these examples is that usability only has a direct influence on the consumer after the purchase, but it has an indirect influence on the product through reputation, shaped by consumer experience after purchase. The question is this: Under what circumstances does poor usability so impact a product's reputation that it damages sales? How should we explain the phenomenon that in some cases usability problems do not lead to customer dissatisfaction while in other cases they do? One might think that the explanation lies in the severity of the problems; our examples suggest it is not this simple.

**Must-Have, More-is-better,
and Attractive Usability**

I find that the model proposed by Noriaki Kano provides a means to make sense of the relationship between usability problems and

customer satisfaction. Kano's quality model is a general framework for understanding the relationship between product qualities and customer satisfaction [2]. The model identifies different categories of product qualities. "Must-have" factors (originally translated as "must-be") represent the quality that customers expect from a product. If the "must-have" factors are not present in the product, the consequence is customer dissatisfaction. The "more-is-better" attributes have a linear impact on customer satisfaction. The "attractive" factors make a product stand out from the others and provide high customer satisfaction. These factors address unspoken or unexpected needs of the customer that when satisfied, create a positive surprise, and lead to high levels of satisfaction. In a recent work, Kano applies a dining experience to this model [3].

Customer satisfaction is not based on the weighted average of these factors. Rather, in my interpretation of Kano's idea, they appear to be relatively orthogonal. Must-have factors should be present in the product—attractive factors do not compensate. Excellent usability of a phone would surely please the user but it does not compensate for the dissatisfaction caused by reliability problems, a short battery life, or absence of other must-have qualities.

The Kano model originated in Japan where it was published in 1980s. It is a general quality model, which explains the relationship between different product factors and customer satisfaction. Although Kano was talking about quality in general, it seems we can certainly apply the same classification to different

usability factors. This is shown in Figure 1. The lower curve of the model reflects must-have usability that the customer expects from a product. The absence of must-have usability will lead to customer dissatisfaction but meeting the must-have usability is not enough for attaining customer satisfaction. Increased customer satisfaction can be achieved through more-is-better usability which has a linear impact on customer satisfaction. However, to achieve dramatic impact on the satisfaction of customers, attractive usability is required in addition to these other factors.

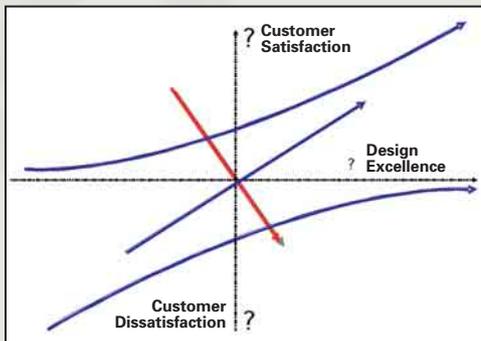


Figure 1. Must-have, More-is-Better and Attractive Usability

Must-Have Usability

In the case of the digital camera and DVD player, the devices were the first ones I had ever owned; and having no prior experience, I had no specific expectations of their usability. Although these products had usability problems, my use experience did not lead to dissatisfaction because *the products met my “must-have” usability expectations.*

The situation in the market was probably similar in the cellular-phone example. For most customers it was their first cellular phone, and although the device had usability

problems, it probably met their must-have usability expectations.

The situation was different in the cases of the coffee maker and the smart phone. I had previous experience on both kinds of products. I was accustomed to a simple coffee maker, with an automatic filter switch and very few removable parts. This experience set the standard for my must-have usability expectations which was not met when using the new one. Similarly, my must-have expectation with the smart phone was the ability to touch type with the keyboard, and this need was not fulfilled. In both of these cases I was dissatisfied because the devices *did not meet my must-have expectations.*

The concept of must-have usability explains why usability problems sometimes lead to customer dissatisfaction and sometimes not. Evidently, even “big” usability problems may be acceptable to consumers if their must-have usability expectations are met. On the other hand, minor usability problems in some cases—as my experience with the coffee maker—may lead to customer dissatisfaction.

Meeting must-have usability means avoiding user dissatisfaction. One can surmise that *users may be happy with poor usability if they have no better prior experience with a product.*

More-is-Better Usability

Customers define product requirements typically at the level of more-is-better qualities. Customers do not speak about must-have or attractive qualities. Must-have qualities are not conscious customer requirements because customers take them for granted. In the case

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of attractive usability, customers would not know what to expect, since by definition these are things that surprise them. However, even if must-have usability needs are completely fulfilled, there is no guarantee that customers will be satisfied.

More-is-better usability means advances in the “normal” usability performance of the product. Users would probably be able to carry out their key tasks more efficiently than with an earlier version of the product. Such “continuous” improvements have a linear, positive impact on customer satisfaction. More is generally better and good performance in these areas will improve customer satisfaction, but not dramatically.

Attractive Usability

To attain true customer “wows,” something more is required. Attractive usability factors meet the unspoken or unexpected needs of the customer. They lead to high levels of satisfaction. In competitive situations when products or services provide similar performance, addressing the attributes that delight and excite customers can prove a competitive advantage.

Attractive quality in terms of usability would mean dramatically easier and different ways for users in achieving their goals. It also may mean that a product would help users achieve totally new goals that they had not been thinking of earlier.

My first PDA had a “thumb typing” keyboard. The keyboard designed for touch typing of my second PDA represented exciting quality to me—I really wanted to have it after

seeing other people touch typing with the device. Examples of surprising quality can be continuously found in new cars.

Keeping Up with Must-Have Usability

According to the Kano model, attractive and more-is-better factors turn into must-have qualities over the course of time. In other words, factors that were exciting and exceeded customers’ expectations at one time become part of the experience that a customer cannot live without.

When I got my first PDA, I was completely happy with the “thumb typing” keyboard. The possibility of touch typing that came with the newer PDA model was a surprising feature to me. Today, it represents a must-have quality—I would not consider such a device without the possibility for touch typing.

Implications

The Kano model helps in the strategic positioning of usability in corporations. The minimum is to achieve must-have usability, and some companies might choose that strategy. This choice means that usability is not a competitive factor but a company can avoid customer dissatisfaction. More-is-better usability means keeping pace with the competition in terms of new features. Attractive usability would mean aiming to stand out from competitors in terms of complete usability.

Even setting the target low—at must-have usability—does not necessarily mean that one should pay no attention to usability. The must-have level of usability may be rather low in some cases, but it still exists.

Typically, home appliances fall into this category. This could also be the situation when a new product innovation is introduced into the market. For example, when cellular phones were first introduced in the 1990s usability problems did not cause dissatisfaction and damage the reputation of the product because the expected usability level was so low. Conversely, attractive and more-is-better usability qualities evolved into must-have usability over the course of time.

Every company basically faces the challenge of understanding where the level of must-have usability is in the market place. The level may have been quite stable in some devices. But innovations of other companies may suddenly raise the requirements. Systematic follow-up of the usability of the competing products is required. The level of usability of the cellular phones from '90s would certainly not meet the current must-have usability requirements of customers.

The situation is more challenging with products with more functionality, such as PDAs. The level of must-have usability is high. The experience of using computers means that users do have more and more expectations. Today, I have a small smart phone with a stylus-operated touch screen. I am a bit disappointed because the device does not have those features from the PC world that I am accustomed to, (e.g. the "select-copy/cut-paste" functionality). Meeting the must-have usability level in more complex consumer devices is a challenge that cannot be achieved without professional usability engineering.

It is extremely important to understand

one's user segment. I was disappointed with the keyboard of the new smart phone. On the other hand, my colleague—who started using it after me—has been relatively satisfied with it. I was probably an exception, but what if other smart-phone users had similar must-have usability expectations? A clear failure in terms of must-have usability is, to a user, like playing with a game device where changing from one game to another is much more difficult than expected.

It is even more challenging to achieve true advances in more-is-better usability and attractive usability. Achieving exciting usability is not easy. The question is not only about design solutions; an even bigger challenge is identifying and understanding where improved usability would truly excite consumers. Gaining surprising usability is difficult to achieve without high skills and advanced usability methods in place to analyze and understand users' needs.

Conclusions

Consumers do not calculate cost-benefits of usability, and usability is not visible when purchasing a product. Usability, however, may remarkably impact customer satisfaction and, consequently, product reputation. The Kano model helps make sense of the impact of usability on the customer satisfaction. Meeting must-have usability is the minimum requirement but achieving even it is not always easy. To attain high levels of customer satisfaction, companies should exceed the expectations of customers through introducing products with attractive usability.

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REFERENCES

1. Bias, R. and D. Mayhew, eds. *Cost-Justifying Usability*. 1994, Academic Press.
2. Kano, N., N. Seraku, F. Takahashi, and S.-i. Tsuji, *Attractive quality and must-be quality*. *The Journal of the Japanese Society for Quality Control*, 1984. 14(2): p. 39-48.
3. Parker, K., *Kano Analysis. A Little Something Extra Can Have Big Results*. <http://www.isixsigma.com/library/content/c030630a.asp>. Accessed May 22, 2004

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