

# Towards Exploring Metrics for Assessing Positive User Experience in Health Care Industry of Developing Economies

Bhoomica Aggarwal  
HCL Technologies Private Limited,  
Noida, India

Remica Aggarwal  
School of Business, University of  
Petroleum & Energy Studies,  
Dehradun, India

Lakshay Aggarwal  
Sociobuddy Technologies Private  
Limited, Delhi, India

## ABSTRACT

User experience or UX is the customer experience with electronic devices and as per recent studies, usage of rich electronic devices boosted the significance of rich UX in health care domain. This can be seen by the evaluation of various metrics associated with the rich customer experience with health care facilities and products. Present research work explores some of these metrics.

## Keywords

user experience metrics ; user experience ; health care metrics; UX metrics ; user centered design

## 1. INTRODUCTION

User experience which is also referred as UX can be seen in most of the device, used by humans while interacting with the technology. As per the recent study, the usage of electronic medical device boosted the significance of rich UX in health care domain. Due to this, more focus is given on user-centric design principles, pharmaceutical sector products, processes, and workflows. Increased demand of rich UX in health care systems [1] has given opportunities to start-ups as customers no longer use traditional health care systems. A significant shift can be seen from “patients” to “customers” that has driven many companies to build new products that are user-friendly and provides health service to people, using that product. Viewing this rapid revolution in health care, the researchers and scientists are demanding better software products and technology to better treat patients. Apple’s Health is the best example to learn the usage of UX in their product. They provide user-friendly, easy to use dashboard for monitoring your health data. On the other hand, there is another firm Telemark that uses Android app for testing the blood of the patient. Harvard University Researchers are working on smartphone based semen analyzer, and they are planning for rich UX for their upcoming product. An add on to this is the electronic health care record or EHR used by apple watch to view patient test results. These health records are quite successful in helping physicians to efficiently manage their practices with the support of Android smartphones or iPads. User friendliness and high usability have driven the success of this technology as it helps doctors to serve their patients better.

### 1.1.Measurement of user experience : UX metrics

Metrics are a difficult discussion when it comes to measuring the success. For example, if we run user testing and make a change to a website that presumably improves the user experience based on our observations, how do we really know the change has worked? What UX metrics can we use to measure success? How do we prove to our bosses that the

investment is worth it?”[2] The question also arises as per different ways in which the user experience can be measured.

- For instance, it can be measured from the responses at the website, the responses at the blogs or social channels or the responses towards the ease and comfort with the product.
- It can also be measured as per how well the blog post is attracting traffic, judging the quality of content and comments.
- It can be measured as per the fan following of the blog or website content.

Present research work discusses various metrics for measuring user experience in health care and various managerial implications afterwards. Section 2 discusses the various metrics as reviewed from literature. Finally managerial implications have been provided in section 3.

## 2. USER EXPERIENCE (UX) METRICS FOR HEALTH CARE

So what UX metrics do the experts use? Various keywords such as “UX metrics in health care”, “UX metrics for health related technology” etc. have been used over google search engine to get the relevant literature online. The related metrics have been mentioned below.

### 2.1 Conversion rate (CVR) [3]:

“The conversion rate measures the percentage of users who complete a conversion out of the total number of visitors to your site or app (or email or ad)? In the medical field, CVRs are below average; and website designs tend to be a decisive factor. It is advisable to make the website an ADA compliant—that is, designing its UX for users affected by disability. Such website provides an online experience accessible to everyone, including people with disabilities. Such websites accommodate visually impaired users, creating content suitable for screen-readers, using descriptive links, and making website actions easily accessible via a keyboard.

### 2.2 AOV :

AOV means average order value, and this is simply your total revenue per number of checkouts. If your UX efforts directly tie into increasing cross-selling or upselling, then AOV can be an indicator of whether you’ve improved things or not.

### 2.3 SUS [4]:

also known as ‘System Usability Scale (SUS)’. It is a Likert type scale used to receive the scores obtained by users when

the usability test is carried out on users on the website. These are the types of questions that can be asked, which are responded to by clicking on an option from strongly agree to strongly disagree .

- I think that I would like to use this website frequently
- I found the website unnecessarily complex
- I thought the website was easy to use

Metrics are a difficult discussion when it comes to measuring the success. For example , if we

The scoring system is complex. The participant's scores for each question are converted to a new number, added together and then multiplied by 2.5 to convert the original scores of 0-40 to 0-100. Though the scores are 0-100, these are not percentages and should be considered only in terms of their percentile ranking. Based on research, a SUS score above a 68 would be considered above average and anything below 68 is below average, however the best way to interpret the results involves "normalizing" the scores to produce a percentile ranking.

## **2.4 TPI :**

also known as Task Performance Indicator has emerged as potential UX metric "to measure the impact of changes on customer experience". With TPI you ask 10-12 'task questions' that are created especially for the 'top tasks' you want to test (these will need to be repeatable, as they'll be asked again when running the test again in 6 – 12 months time). For each task, the user is presented with a task question via live chat. Once they have completed the task, they answer to the question. The user is then asked how confident they are in their answer. TPI takes into account:

- Target Time: how long it should take to complete the task under best practice conditions.
- Time out: the person takes longer than 5 minutes.
- Confidence: At the end of each task, people are asked how confident they are.
- Minor wrong: the person is unsure; their answer is almost correct
- Disaster: the person has high confidence, but the wrong result
- Gives up: the person gives up on the task.

Usually a TPI score of 40 (out of 100) has major issues. If you measure again in six months and nothing has been changed, the score should again result in a TPI of 40.

## **2.5 NPS :**

Net Promoter Score (NPS) is a survey you can include at the end of your UX tests. NPS helps you measure loyalty based on one direct question: How likely is it that you would recommend this company/product/service/experience to a friend or colleague? Those who respond with a score of 9 or 10 are called 'promoters'. Those who respond with a score of 7 or 8 are called 'passive'. They are happy customers but not loyal customers . Finally there are the 'detractors' i.e. the customers who responded with a score of 0 to 6. The final NPS score is then calculated by subtracting the percentage of customers who are detractors from the percentage of customers who are promoters.

## **2.6 Recency and frequency of site and application visits**

These two user engagement metrics influence the health care business a lot . Recency looks at the number of days that have gone by since a user's last visit, while frequency points to the total number of visits a user has made. This powerful data can inform decisions regarding content strategy, marketing promotions and, most importantly, an organization's UX strategy. For example , if it is discovered that returning users tend to visit blog posts on tech medical devices , the related pages and features should be easier to spot for the first time or occasional visitors.

## **2.7 Motivation and user engagement across wearables or voice technology**

The rise of wearable health technology has done wonders for patient engagement. When it comes to designing a better UX for a wearable, focus on its features. For a gadget designed to monitor a patient's fitness, for example, feedback on performance and messaging features could potentially increase motivation among users of these devices. Analytics tools can give you a clear idea of how you can improve UX based on gender, lifestyle, and preferences. Additionally, digital voice technology can be used to deliver quality user experiences in healthcare.

## **2.8 Browser usage**

Browser trends show that Chrome and Safari are dominating the market. From a UX standpoint, this means that designers and marketers, including those in the healthcare field, should adjust their web strategies to better accommodate those browsers. It's worth mentioning that push notifications are a great way to re-engage with patients. These interactive messages can be anything from exciting offers and discounts to reminders about scheduled appointments or notifications about new content.

## **2.9 Progressive Web App (PWA)**

Almost 60% of traffic now comes from smartphones and tablets. What's more, an increasing number of patients are using their mobile devices to search for local healthcare providers. Whether you're a medical practice or a hospital, your UX strategy should be aimed at making each action seamless for your user, from scheduling appointments to accessing health information. For instance, patients should be able to spot your phone number in a matter of seconds, and have the option of one-touch dialing. Quite recently progressive web app or PWA has been created. A hybrid between a website and an app, PWAs are quick and responsive.

## **2.10 Customer churn**

Customer churn, a metric that analyze the rate at which customers stop using your products during a given period of time, is highly influenced by UX. Churn rates can easily be lowered by enhancing your product with a couple of basic UX design principles. This can be done by decreasing the steps users take between signing into your app and using its main features. Using chatbots is another sure way to keep customers coming back. Fitness apps that used chatbots to send notifications and reminders significantly improved user retention.

## 2.11 Click-through-rate (CTR)

The CTR looks at the percentage of people who click on your listing (such as a “sign-up” button for a consultation), whether that’s for a healthcare product, marketing email, or advertisement. It is calculated by dividing the number of times your listing receives a click by the number of times it has been shown. For healthcare, the CTR is higher than for other industries. One explanation is that healthcare marketers tend to create ads that contain the long tail keywords that their target audiences are most interested in. Another great way medical marketers can improve their CTR is by writing advertisement copy that promises a solution to a particular issue their patients struggle with. An example: “Are you experiencing chest pain? Our survey can help you figure out if you’re at risk for heart disease. Sign up today.”

## 2.12 User feedback

There’s a variety of analytics tools that can measure user feedback. Some scan and interpret users language during a live chat support session or when interacting with virtual assistants such as chatbots. Other tools use data collected from email surveys, customer feedback forms or live Q&As. You can also use tools that enable you to do something called “social listening,” which is basically eavesdropping on social media conversations around your brand. This feedback can be used to improve almost every aspect of the UX.

## 2.13 Bounce rate

While average bounce rates range between 45% and 66%, healthcare sites, and particularly those in pharma, have closer to 60% rates. The reason being that most health websites tend to be mundane, use cryptic medical jargon and have readability issues. Further going mobile can drastically lower your bounce rate. A couple of ways to improve your users’ mobile experience: increase the size of your text and buttons, shorten online forms, and make your CTAs noticeable using strong colors.

## 2.14 App referrals

With more than 200 health apps launched every day, it’s increasingly challenging to get customers not only to use your app, but to also refer it to their friends. You can design a basic in-app referral system using a handful of UX techniques. For instance, if your hospital launched an app, prompt users to invite friends through Facebook Messenger right before completing a critical step such as scheduling an online appointment or checking their lab results.

## 2.15 Time on page (or in app)

This metric is designed to help you understand how much time users spend looking at your website or interacting with your app. According to a recent report, the average time spent on healthcare websites is over three minutes, which is higher than the general average session duration of 2 minutes and 17 seconds. These metrics can be influenced by many variables. On a website, slow loading web pages, clunky design, and dull content are among the main reasons users don’t stick around for too long. Focus on optimizing your website and creating content that shows complex information in easily digestible ways, such as infographics.

## 2.16 Uptime — or how long an app runs without failing

Nailing the mobile app user experience can’t be done unless you ensure that your application is running as smoothly as possible. Here’s where uptime monitoring tools come in

handy. Uptime refers to the percentage of app loads that don’t crash. To remain competitive, your app needs an uptime greater than 99 percent. Developers can use uptime checkers to discover and fix problems in their apps. However, crashes are bound to happen once in a while.

## 2.17 Speed and load time

Customers are unforgiving towards slow mobile apps. The ideal loading time for a mobile app is about two seconds. For every additional second that your app takes to load, the conversion rate declines by 7 percent. Measuring your app’s speed and load time can flag UX errors you wouldn’t have noticed otherwise. Take, for instance, interface clutter. Responsive apps usually have a sleek interface. In contrast, apps with a lot of buttons, images and icons take longer to load, so it is usually advised to limit the number of interface elements.

## 3. MANAGERIAL IMPLICATIONS & CONCLUSIONS

- Managers may make use of user centric design principles to improve UX in health care.
- **Half solved problems with analytics** : Google Analytics can tell you what’s happening but not why it’s happening *i.e.* surely going by only analytics will be an educated high informed guess and you missed on the reason behind the happening of an event. And this makes creating metrics around UX improvements difficult.
- **UX effectiveness is hard to measure.** It’s a good plan to have UX-specific requirements in a project, but often these can be something that doesn’t necessarily correlate with UX effectiveness. In order to increase usability of a app for an instance by the users , it may sometimes require to reduce the effectiveness of UX.
- **Research implications** : Interpretive Structural Modelling (ISM) or hybrid interpretive structural modelling and structural equation modelling (ISM-SEM) approach can be applied further to analyze the interrelationships amongst the various UX based health care metrics discussed in section 2 above .

## 4. ACKNOWLEDGEMENTS

Remica Aggarwal extend her sincere thanks to Mr. Arpeet Sahoo (student from BITS Pilani , Rajasthan) for working with her on the concept of user experience and UX metrics. This has helped the author to apply the concept to health care industry .

## 5. REFERENCES

- [1] <https://www.dr-hempel-network.com/digital-health-technology/ux-in-health-care-revolution/>
- [2] <http://www.userzoom.com/blog>
- [3] IOM (Institute of Medicine). 2012. Health IT and patient safety: Building safer systems for better care. Washington, DC: The National Academies Press.
- [4] Metzger, J., E. Welebob, S. Levitz, D. Bates, and D. C. Classen. 2010. Meaningful use of EHRs and CPOE to improve medication safety. *Health Affairs* 29(4):1-8.
- [5] Dirks, J., Satwicz, T. 2014. Personal Health Metrics and Good UX: Partners in Healthcare. *User Experience Magazine*,14(3).Retrieved

- from <http://uxpamagazine.org/personal-health-metrics/>
- [6] Promoting Usability in Health Organizations: Initial Steps and Progress <https://www.himss.org/sites/himssorg/files/2013-HIMSS-Usability-Maturity-Model.pdf>
- [7] Usability in Health IT: Technical Strategy, Research, and Implementation Summary of Workshop July 13, 2010 National Institute of Standards and Technology Gaithersburg, MD 20899 [https://www.nist.gov/sites/default/files/documents/2017/05/09/U-HIT\\_Workshop\\_Report\\_Publication\\_Version.pdf](https://www.nist.gov/sites/default/files/documents/2017/05/09/U-HIT_Workshop_Report_Publication_Version.pdf)
- [8] Tullis, T. & Albert, W. 2008. Measuring the User Experience. Burlington: Morgan Kaufmann.
- [9] UserZoom: <http://www.userzoom.com>
- [10] Weischedel, B. & Huizingh, E. 2006. Website Optimization with Web Metrics: A Case Study. Proc of ICEC 06, ACM Press, pp. 463-470.
- [11] Kerry Rodden, Hilary Hutchinson, and Xin Fu , Measuring the User Experience on a Large Scale: User-Centered Metrics for Web Applications <https://static.googleusercontent.com/media/research.google.com/en//pubs/archive/36299.pdf>
- [12] Metrics for Comparing User Experiences in Health IT - National <https://nam.edu/wp-content/uploads/.../HCS-Health-IT-User-Experience-Methods.pdf>