

A Necessity for Heuristics in Health Apps

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Abstract

Health applications are slowly finding their own place in society. Being able to automate answers to some medical enquiry, these applications prove to be of great value and the dependencies on them are likely to increase over time. However, health applications pose a concealed risk as well. While these apps can be the starting point of a new lifestyle, wrong information by the health apps can lead to a disastrous outcome. Hence, this prompts the need for a good heuristics to evaluate the app.

Introduction

With the proliferation of applications made accessible to the public, health applications have made their way into society. Health applications can be seen as an attempt to reduce the burden on hospitals by allowing for remote interactions between patients and hospitals through the apps, hence able to alleviate hospitals' physical space constraint. For example, long-term patients with minor ailments are no longer required to physically visit the hospital, as feedback and input from the doctors, or even automated response, can be acquired through the apps. In the case of automated response, this can decrease the doctor's workload and enable hospitals to allocate resources more meaningfully.

Furthermore, the ubiquitousness of the smartphone further supports the advent of health applications. In a study by Han(2018) suggests that users of mobile health applications display an improved lifestyle as well as their knowledge about clinical procedures. This can be explained by the fact that the massive increase in the ease of access to health-related information through smartphone encourages users to be more engaged to this matter.

As the dependencies on these health applications increases, its impact on the public will increase as well. These apps can be the starting point of a new lifestyle, but wrong information by the health apps can lead to a disastrous outcome. Consequently, the health apps need to be of a certain standard that at least guarantees zero wrong information is given to the users and gives urgency for the need for a good heuristics to evaluate the app.

Heuristics

According to Cho (2018), there are 3 levels of heuristics that can be used to evaluate the health applications. Cho structured these heuristics to be incrementally harder than the last. The reason for this progressive way of evaluation is to force the apps to be thoroughly evaluated and to have a strong foundation. While Cho's heuristics can be seen as a general one, it is designed

to prioritise the correctness of functionality — the main concern for any health app — compared to other aspects (e.g aesthetic, simplicity, etc).

Level 1 (User-Task): User-centered design

This level requires the apps to integrate the consideration of users' requirements into the process of making them. This is the most fundamental requirement to be fulfilled before moving to on the next level. Additionally, early feedback from potential users will help the apps to fulfil their purpose better, as well as improving their users' interface.

Level 2 (User-Task-System): Usability evaluation in a controlled setting

In reality, there are too many variables that can affect the apps' performance and effectiveness. Unfortunately, it is unfeasible to address them all at once. The more meaningful move is to initially filter out some variables by conducting the evaluation in a controlled setting, such that the developers can focus on more pressing issues. In this context, controlled setting includes selectively choosing the users that meet the intended end-user specifications. For example, they are required to have a certain level of familiarity with technology in order to ensure that any issues that surfaces are due to faults of the system instead of their lack of technology skill. By focusing solely on the vital shortcomings of known reasons, this level allows a more meaningful evaluation for the developers.

Additionally, evaluation by experts instead of specifically-chosen users can also be used. We define experts to be those who have a sufficient knowledge (masters degree) in the related field and training in human-computer interaction. In comparison to normal users, experts can give feedback from a professional perspective, picking out problems that may remain unseen to the untrained users. Hence, under specified conditions, the apps are supposed to function properly before moving on to the next level.

Level 3 (User-Task-System-Environment): Usability evaluation in a real-world setting

It is assumed that the apps have passed Level 1 and Level 2. At this point, the apps are able to fulfil the users' requirement under their intended specifications. However, it is undeniable that the environment, as well as unaccounted factors, can influence how users interact or perform tasks in the systems. Usability and efficiency of the system can be greatly altered due to the interplay of factors, and the apps need to be able to function properly by anticipating the changes.

Fitzgerald (2016) employed a different set of heuristics to evaluate health apps, albeit with a slight overlap with Cho. For succinctness, only heuristics not aforementioned will be discussed.

Privacy and data protection

For most apps, users' data should be isolated from one another and can be deleted safely and completely from the database. This secures users' privacy and should be one of the mandatory heuristics for any app.

However specifically for health apps, this is a conflicting issue. Data gathering of users' activities is crucial as a real-time feedback to the system, and even more so for health apps since the diagnosis of the user is done solely based on the users' data. A wrong diagnosis may be one of the most fatal things the app can do as it can affect the patients in dramatic ways. Data gathering is even more encouraged as a large database can also be useful for future references that can improve the quality of future diagnosis.

In order to bridge the conflicts, this heuristic should be modified such that any data collected should remain as anonymous as possible instead of being completely erasable from the system. Personal identifiers (e.g name), sensitive identifiers (e.g condition), and quasi-identifiers (e.g gender) should be anonymised whenever possible. Parts of data can be shown (e.g using parts of the postcode instead of full postcode) if it still sufficiently hides the users' identities. Hence, this heuristic should evaluate whether the health app can find the right balance between the anonymity of data and specificity of data.

Health apps, in some way, can be one of the more impactful apps that any user has access to. It outputs crucial data and handle sensitive data more so than other apps, and hence the need for a heuristics that are designed appropriately. The heuristics being utilised to evaluate health apps should guarantee its correctness before anything else, even if it means a slight compromise on users' data privacy.

References

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