

HCD-201: Ethics in Computer Engineering
Assessment Activity HCD-201:00010
Ethical Issues surrounding the proposed Government Welfare App

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The following report will be discussing the project proposed in building a digital government welfare mobile application for citizens along with a server-side software and databases for the government agency involved or responsible for the welfare system. The capabilities of the ecosystem can mainly be divided into two main categories; the user's mobile application and the government's server-side software. The mobile application mainly focuses on the ability for citizens to be able to apply for benefits via the mobile application. The government's dashboard would contain features of the following: An automated, rule-based and/or A.I.-based screening and categorization of the recipient's eligibility, the ability to transfer of benefit funds to recipients' bank accounts or digital wallets, ability to display the benefit history (such as their past medical record benefits) of individual recipients, monthly reporting of summary trends, cases services, a feature to query an individual's case of past benefit records and, integration with social media to communicate with current and potential recipients to encourage participation. These capabilities may benefit both the recipients of the welfare program and the government agency in charge of said program; however, there are various potential ethical issues that are present in the proposed plan which can lead to severe consequences for both parties.

The first feature proposed by the government is a set of facilities that allow the user to upload documents such as, house registration, salary records, and any other supplementary documents. These features will certainly be very beneficial for the public to be able to sign up for welfare benefits directly from their devices; however, there are several critical ethical issues that are present in the feature itself, and other ethical-related issues that may arise during the implementation. Its main issues are related to security with its main concern is regarding the security of data transfer process between the data uploaded by the user to the government's servers, and privacy with its main concern is regarding the sensitivity of user data as they are personal documents that can be used to identify an individual, thus, a set of highly sensitive data. If said features are not implemented properly without accounting for security and privacy measures, they may result in critical vulnerabilities that can be exploited by bad actors, e.g. Man-in-the-middle attacks, leading to various government systems being compromised which will result in huge data leakage cases or other harmful implications. These potential technical issues then translate to several ethical issues, such as, the violation of the ACM's code of ethics of avoiding harm and respecting privacy or the IEEE's code of ethics of protecting privacy and holding paramount of public safety. These issues can be mitigated by implementing certain security features such as, end-to-end encryption for data transfer such as the Signal protocol used in the Signal messaging app along with best practices for server-side security such as, regular software updates, strong authentication mechanisms, firewalls and others.

The second proposed feature by the government is the ability for the system to screen and categorize the eligibility status of recipients. This feature creates a situation where the A.I. or machine learning model that is used for data analysis is exposed to sensitive personal data such as, names, surnames, date of birth, national I.D. numbers or other data that is needed for the categorization; a clear violation of multiple data protection laws, such as the GDPR of the E.U. or the PDPA of Thailand, along with the violation against the ACM's code of Ethics specifically on the clauses of avoiding harm and respecting privacy of the user as well as profiling leading to potential discriminatory biases due to the A.I. model's biases. There are several ways to mitigate these ethical issues such as, asking the user to give consent to the government in using their data for analytical purposes or the anonymize as much data as possible, however, said feature still poses an ethical issue when it comes to personal data privacy and is not easily solvable without the full consent of the owner of the data.

The third feature is the ability for the government to be able to transfer benefit funds to the recipients' bank accounts or digital wallets. For this functionality to be implemented, there are several requirements needed, e.g. the user's personal bank account number, which can then be used to identify more information regarding the user, such as, real name, age, date of birth, etc. Due to these requirements, it presents an issue around user privacy, how such functionality can be abused by an authoritarian government to target civilians through tactics, such as ethnic or racial profiling, and how such data can be leaked and then be used for malicious purposes along with ethical issues around privacy, confidentiality, and negative consequences (harm) that may occur. These issues can be mitigated, to an extent, by asking for consent from the user to if they would allow the government to be able to transfer funds to their personal bank accounts or not, however, such situation still risks a possibility of privacy evasion.

The fourth feature is the ability to display benefit history for individual recipients. Similar to the third feature, this functionality requires access to citizen's personal data; assuming that the feature was intended for the individuals to view their benefit history, there would not be a huge concern as the data is under the ownership or control of the patient. On the other hand, another feature proposed enables the welfare agency personnel to be able to query individual data, showing a detailed examination of an individual's case; this would be considered as a violation of the patient's privacy, a clear violation of the ACM's privacy and avoiding harm clauses, as a case of a welfare agency personnel were to access an individual's data without the individual's consent could lead to potential consequences, such as, possible leakage of private and/or sensitive data, biases, discrimination in providing welfare benefits, and so on. Possible ways to mitigate such issue is to prevent any remote access to the patient's data and instead perform the search query in person with the individual's full consent in using their personal data for various processes, such as, checkups, verification, and so on, or, if possible, the system must be designed in a way that the data can only be revealed by the user via a QR code or. If these solutions are not applicable, it is better to remove the feature altogether.

The fifth feature is similar to a dashboard that includes a monthly reporting of summary trends, cases serviced, and other statistical data for welfare agency personnel. Such dashboards require, similar to other features, access to citizens' personal data, which raises concern in regards to potential privacy evasion as seen in the ACM's code of ethics on respecting privacy and avoiding harm as data leakage can lead to severe consequences, such as, identify theft, and other risks. There are ways to mitigate these issues via the anonymization of data, as in, the data that is being displayed on the dashboard must not be able to be used to identify an individual and must only display statistics, such as, general trends, summaries, future trends, and other statistics.

Finally, the seventh feature is integration with social media (Facebook, LINE, Instagram, YouTube, etc.) to communicate and potential recipients and encourage participation. This feature raises several ethical issues as the system is incorporating social media platforms which could potentially lead to data being sent to companies, such as, Meta, Google, and other "Big Tech" companies, which has shown to be subjected to potential data mining practices and poor privacy protections. Ideally, as this feature is not considered as an integral part of the system, it would be preferable for this feature to be removed and instead be replaced with a simple announcement section or news section that is dedicated to new information, such as, system updates, policy changes, new requirements, and so on. In regards to communicating potential recipients, it would be ideal to have a specific marketing department that handles any type of communication through social media platforms.

In summary, the proposed welfare system will certainly improve the lives of citizens through automation, ease of access, and digitization. However, due to the system's requirement of accessing citizen's

personal data; there are several ethical issues that may arise during development, mainly related to data privacy and system security, nonetheless, there are still several ways to mitigate said ethical issues, improve the patient's personal data security, and reduce any amount of harm from data leakages and potential server exploits. Therefore, it is recommend for developers, system administrators, and the government agency in charge of proposed system to be aware of potential risks of privacy evasion, in which, can lead to legal actions and other severe consequences.