The Digital Health Revolution

At the state of a maturing society, an increasing amount of Canadians are seeking to live healthier lifestyles and prolong longevity. Fortunately, with the development of new technology the ability to attain these objectives becomes much more easily accessible. Given the influx of smartphone usage, there has been a large growth of health and fitness apps available on the digital market. These apps enable a user to input specific data into their mobile devices on daily activities to self-monitor various health-related information such as calorie intake, heart rate, REM-sleep patterns etc. While these apps empower users to keep track of one’s own health they also raise concern as to what companies aim to do with users’ personal data and how they intend to protect them. Given that health is a very private matter in our society, the privacy policy of these apps has great importance along with the ethical debate over the monetization of personal health information. Supposedly ceasing an end to these concerns, Apple has revolutionized the app industry with its latest iOS update. The multinational corporation released the Health app and HealthKit tool in late 2014, intending to change how health and fitness apps are used, developed and supported. These new features allow Apple to harness the power of big data with control over extremely large data sets and the ability for analyses. In exploration of Apple’s newest revelation alongside mobile health and big data discourse, both the benefits and costs will be revealed to determine the potential for digitizing personal health.
To illustrate how Apple has profoundly altered mobile health apps, it is essential to understand how these apps work to begin with. In addition to providing the ability for self-monitoring and management, applications process data and provide interactivity to give an element of self-assessment (Carrera & Dalton). In example, users of MyFitnessPal log food consumption on daily basis, resulting in information on calories, proteins, carbs and fats consumed with comparison to ideal amounts for achieving weight-loss ("MyFitnessPal iPhone App"). While data is usually manually inputted, there are devices that allow automatic collection displaying the active participation of consumers in ‘digitizing’ their bodies (Lupton). With the line of Fitbit bracelets, users are able to track their heart rate, periods of activity and sleep patterns, while the fitbit app displays findings in charts and graphs ("There's a Fitbit Product for Everyone"). These allow consumers to inform themselves about vital health metrics, giving control over experiences of health or illness with real-time information (Carrera & Dalton). Consequently, individuals are increasingly using these gadgets and applications for tracking, quantifying, and documenting everyday life activities (Klauser & Albrechtslund). As in June of 2014, Yahoo’s mobile analytics firm reported a 62 per cent increase in usage of health apps (Bradshaw). Since users’ were using various apps for specific uses, Apple introduced the next step by integrating separate health and fitness apps to form one all-encompassing health monitoring system.

This transformation stems from Apple’s creation of the Health app for consumers and HealthKit tool for developers. Granting user permission, the Health app is able to combine various health and fitness apps to be viewed under a single dashboard. Underlying the system is the HealthKit tool, which enables developers to contribute data from their apps and draw on information from others (Bradshaw). This innovation provides an overview of a user’s health
accessible from one place while the collaboration of various apps allow for more comprehensive analyses. In relation to the apps such as MyFitnessPal and Fitbit, the ability to combine a calorie intake and fitness-tracking app would provide a more complete picture for enabling weight-loss by linking calories consumed to calories burned. Moreover, Health allows users’ to gather and store information on blood alcohol content, blood glucose, inhaler usage, blood pressure, body temperature and so on. Apple has also been speaking with organizations such as the Mayo Clinic on the possibility of using the app to contact doctors directly in the event of worrying readings and push data right to the clinic (Woollacott). Such a system encourages consumers to develop routines for regular physiological assessment and an expertise in monitoring their bodies that was once the preserve of healthcare providers (Lupton). Empowering as it may be, this technology does not come without a cost. In granting the Health app permission, the user permits numerous companies’ access to a digital archive of an individual’s body that obviously contains a large amount of intimate details.

With the rise of the Internet and social media, users have progressed into becoming more open beings as these online environments foster the sharing of information on personal lives, thoughts and experiences. Today, self-tracking is often “coupled with social interaction and sometimes framed as entertainment or games” (Klauser & Albrechtslund). While this is observed, there are still high and increasing levels of concern over privacy that are driven by fears of new technology and distrust of institutions using personal information with sufficient respect for individual civil liberties (Bennett & Raab). Thus a significant question to ask is whether users’ can trust Apple with personal health data by the same degree of confidentiality as discussing with family doctors. In a study of Canadian dietitians’ use of mobile devices and apps in practice, it was found that patient privacy was of concern and a frequently mentioned issue in
mobile health literature (Lieffers, Vance, Vivienne & Hanning). Issues of accuracy are also significant with health data, as technological fallibility raise concerns on how health information is used, kept and processed with the possibility of false diagnosis (Bennett & Raab). The *Health* app also does not allow the sharing of health data with anyone via social networks, meaning data is held responsibly in communication channels between the user, Apple and the other apps. Since *Health* is also built into the iOS, this data becomes fixed into the user’s iPhone. This interconnectedness of information systems is noteworthy for it is partly responsible for the erosion of privacy (Bennett & Raab). This is as identification of health information can be easily made through association of a phone number, email address, social network profiles or other identifiers on a mobile device. This in turn weakens that aspect of confidentiality.

Another concern in relation to privacy is not only the possibility of a data breach but also the intended use of collected health data by corporations and Apple. Ensuring privacy boundaries are met responsibly means that, “only the right people use the right data for the right purposes” (Bennett & Raab). Thus it is important to note what measures Apple has set out to keep user data protected from outsiders, corporate manipulation and how they themselves anticipate on using it. Apple states all data in the *Health* app is encrypted when iPhones are locked with a passcode, Touch ID or while in transit and at rest when being backed up in the iCloud ("Health: An Entirely New Way to Use Your Health and Fitness Information"). Prior to the introduction of *Health*, a study conducted by Privacy Rights Clearinghouse found that 43 per cent of health apps shared user-generated personally identifiable information with advertisers, some without the user knowledge (Wollacott). Apple has also tightened up its privacy rules to ensure growing concerns over how developers use personal data does not thwart the new generation of health and fitness apps (Bradshaw). This puts a lot of responsibility on Apple, as it requires major supervision of
other apps adhering to the new set of rules, including the requirement to link to a privacy policy. The privacy policy ensures corporations in charge of personal data exercise fair information practices in collecting, retaining, using and disclosing personal information (Bennett & Raab). These guidelines acknowledge users’ right to know what is data is being collected, to whom this data is accessed by and what is it being used for. These aspects demonstrate how Apple has dramatically impacted developers’ control over data, shifting the balance in favor of user protection.

In addition, Apple also updated their iOS developer program license agreement to completely eliminate the monetization of health data for marketing and advertising. The new licensing agreement strictly states that developers may not, “sell an end-user’s health information collected through the HealthKit to advertising platforms, data brokers or information resellers” (Woollacott). These rules aim to stop data collection for purposes of being used to target adverts for products such as weight loss remedies (Bradshaw). This is a tremendous shift as many apps, especially if they are free to download, rely on selling data to third parties for profits and income. In a recent study prior to HealthKit, the US Federal Trade Commission found that a sample of 12 fitness apps transmitted users' information around dietary and workout habits to 76 third parties (Bradshaw). This questions how successful Apple would be in their efforts for control. Although breaking these rules risk ejection from the App Store while the violation of the privacy policy could involve federal regulatory enforcement there are still some loopholes in the guidelines that allow corporations to bend around the rules. As Apple set out, developers are only permitted to share data with third parties ‘for medical research purposes’ (Woollacott). While they must not use the application-programming interface or any information obtained through HealthKit ‘for any purpose other than providing health and/or fitness services’ (Bradshaw). This is problematic,
as the notion of what validates appropriate purposes for providing health and fitness services or what constitutes medical research is not explained, thereby leaving leeway for the likelihood of abuse by corporations.

Since the introduction of HealthKit is relatively new, developers of health and fitness apps are still beginning to adjust policies in order to meet Apple’s requirements. Subsequently, a query is raised as to whether these health and fitness apps are willing to sacrifice profits or income when opting into the system. Fitbit, the earlier mentioned leading maker of the Fitbit fitness tracking devices reworded their policy to explain ‘we don’t sell any data that could identify you,’ without making any other additional changes (Bradshaw). In examination, some of these apps are actually updating capabilities instead, creating competition and retaliating from subjection to Apple’s rules. Giving up privileges to user data is difficult for these developers, as it remains to be a major source of revenue and competitive advantage (Kitchin). Fitbit has thus introduced a new ‘all-in-one’ app, adding a food log system, weight monitoring tools, user community and much more, with a dashboard of analytics accessible from a laptop ("Meet the App, that’s All-in-One, for Everyone"). Similarly, MyFitnessPal introduced add-ons that allow users’ to connect their account with an assortment of other apps, pushing data to MyFitnessPal. These now include activity trackers like Garmin Connect, scales like Runtastic Libra and other interactive exercise or sports training apps such as MiCoach ("MyFitnessPal iPhone App"). If these companies were free of Apple restrictions, it would be important for users to look deeply into their privacy policies and terms of use to ensure data protection.

Apple themselves have not released any public news on their intentions for the information collected beyond using it to revolutionize the mobile health system. As the chief executive of exercise app Runkeeper, Jason Jacobs states in correspondence to Apple’s Healthkit
initiative that, ‘if they are successful, it could make things both easier for developers and more valuable for consumers and for healthcare in general’ (Bradshaw). While, we have discussed how *Health* can be valuable for consumers, we have yet to see how it would be of value to healthcare in general. While self-surveillance is not a new phenomenon in health, from the use of traditional tools like body scales, tape measures, training diaries to monitor weight, body changes, and training improvements, what *HealthKit* offers is a way for this data to benefit society as a whole (Klauser & Albrechtslund). In imagining that the right people use the right data for the right purposes – that is, people who want to benefit the health of society use information that is truthful for desires of cultivating healthier citizens. Framing *HealthKit* in the perspective of big data discourse, it can be contended that the system has the potential of transforming individual data into utility for an entire society, if enough developers and users opt-in. For *HealthKit* is a big data driven technology with an extremely large data set, compromising of numerous users’ health data, which can be analyzed computationally to reveal meaningful relationships, associations or trends between health metrics and affecting factors (Kitchin).

In conceptualizing how *HealthKit* could responsibly utilize personal health information to benefit society, I propose that this technology could improve urban development and lead to reducing healthcare costs. For example, in analysis of users living in regions without nearby community centers or parks, data in *Health* may show various health issues related to obesity such as being diagnosed with high blood pressure, sleep apnea and/or heart disease. Here the association between social environments and health is revealed through *HealthKit* linking user GPS information with personal health characteristics. This could then provide knowledge of the need for larger government investment in parks and recreation within these neighborhoods and similar areas, which in turn could reduce the number of clinical visits. *HealthKit* is great for this
type of analysis due to being exhaustive, relational and having a degree of velocity. An exhaustive scope provides greater representativeness and validity in the analysis, as with more data available there becomes a better chance in making a true discovery (Kitchin). Relationality provides the ability to conjoin datasets, which can be used to answer new questions, useful for understanding the health of populations on an individual and collective basis (Kitchin). Finally, the velocity aspect of Healthkit admits health data to be generated on a continuous basis allowing us to make observations over time and space (Kitchin). This demonstrates the large opportunity for HealthKit to uncover significant variables that could lead to developing healthier societies for current and future generations.

Of course this potential does not come without costs, as with obtaining these insights also means subjecting personal health information to dataveillance. This is a mode of surveillance enacted through sorting and sifting datasets in order to identify, monitor, track, regulate, predict and prescribe (Kitchin). While the pros of dataveillance include making sense of a great amount of data, concerns arise in relation to profiling, social sorting and governance (Kitchin). Whereas HealthKit is positively displayed in the scenario above, it is equally significant to hypothesize the latent consequences. As analyses that benefit society as whole may not necessarily benefit the individual. In using HealthKit for profiling and social sorting, this could actually lead to negative outcomes for users' when seeking certain services. In example, if an insurance company has access to information on which neighborhood a client lived in and the associated health risks in that area, this would equate to higher fees for the client in which they may not afford or total rejection. This even more problematic if the data is untrue or if the client in question does not fall within the representative scope of the given findings. In the matter of governance, an example
could be the discontinuing a favorite food product from a grocery due to its association with causing harmful effects on shoppers’ health in the given area.

In conclusion, *HealthKit* as a technological instrument has the ability of linking and analyzing diverse datasets for purpose of making insightful discoveries to improve the health of society. Pertaining to the negative implications, given access to such a large sum of data does bring up concerns for the privacy of users’ data and issues of ethical responsibilities. Even while Apple aims to hold a tighter leash on developers, there is still the question of whether these companies would want to opt-in to the voluntary system. However, if Apple wishes to encourage consumer use of *Health*, then a large amount of participation from these health and fitness apps are required. In the end, I personally agree with Jason Jacobs in his statement regarding *HealthKit* expressing that, “there are lots of privacy and ethical implications, for sure, but there is also great opportunity here to make a meaningful difference on the aggregate health of the world” (Bradshaw). In harnessing the power of big data, Apple may just be able to start a digital health revolution that lends a hand in providing a healthier tomorrow for the users today.
Works Cited


