A Review Study on Smart Watches

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ABSTRACT: A smart watch is a computerised wristwatch with features that go beyond keeping time. Modern smart watches are essentially wearable computers, capable of doing simple functions such as computations, translations, and game play. Many people use a mobile to run mobile applications. Some versions, dubbed 'watch phones,' have full mobile phone functionality and can make and receive calls. Smart watches are steadily making their way into the mainstream of technology. Smart watches offer a variety of functions, including fitness tracking, long battery life, voice response to messages, and the ability to connect to the internet wirelessly. In everyday life, smart watches are one of the most anticipated launches on people's minds. Smart watches have the potential to improve everyday health by allowing self-monitoring of personal activity, receiving feedback based on activity measures, conducting in-person surveys to identify patterns of behaviour, and facilitating bi-directional communication with health care providers and families. Smart watches, on the other hand, are a relatively new technology, and research on them is still in its infancy.

Keywords: Battery, Calculator, Multitasking, Pebble, Power, Slumber.

INTRODUCTION

There are a plenty of great smart watches to choose from, ranging from the Android Wear army to the most recent Pebble watches, and the Apple Watch is also selling like hotcakes. With smart watches we can find apps in android watch, download and install applications, Keep an eye on the navigation. Smart watch stay on your hand and inform us what's happening. We won't appear tired in meetings [1][2].

1. Benefits of Android wear smart watches

1.1 Slumber: Slumber just blacks off your screen while our watch is charging. If user is charging the watch overnight, this light will be glaring in user face, and on some watches the continuous display has even caused screen burn-in most Android Wear devices turn on to charge and display a screen indicating the current battery level (Figure 1) [3].

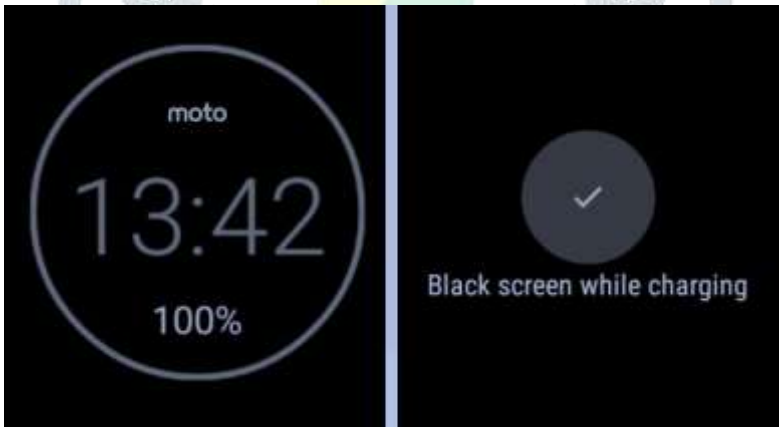

Figure 1: Illustrating the Main Screen of a Smart Watch

1.2 Smart Watches Are Mankind's Gadgets

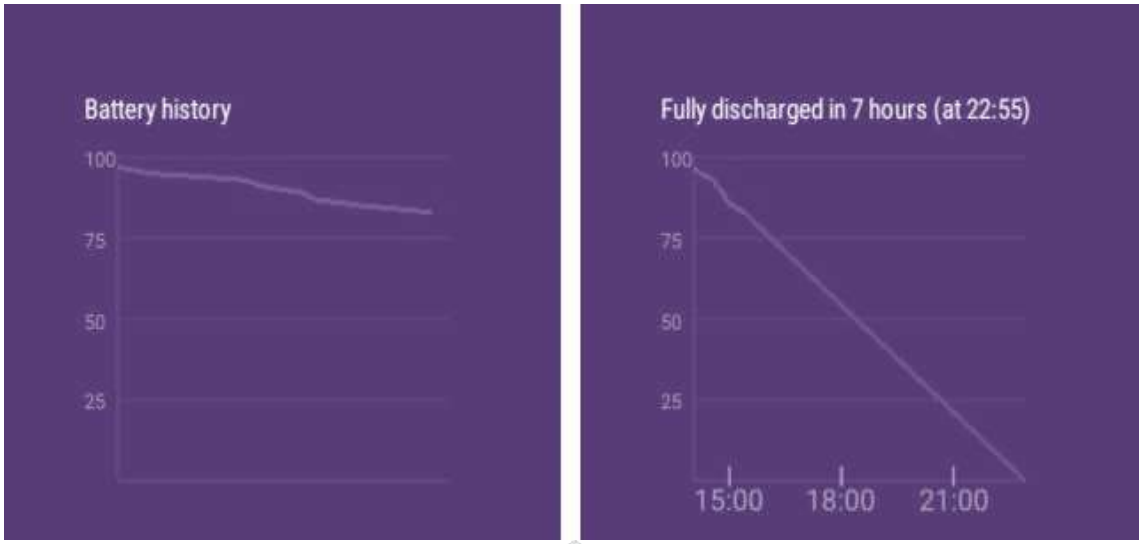

Figure 2: Illustrating the Batter and Discharge history of Smart Watches.

Smart watches are a type of wearable device that allows us to keep our hands free while also allowing us to use our smartphones away from our bodies. The smart watch help to determine the battery consumption of the user's phone, and Wear power supply Stats can help in calculate the drainage of the phone battery.The app's watch counterpart gives you a barebones view of what's going on with your battery, but you'll want to open the app on your phone for the most information. You'll be able to see how much time you've spent staring at your screen and which apps you've used as shown in Figure 2 [4]–[6].

1.3Smart Watches as a Calculator

Smart watches used for calculus homework, having an accessible calculator are a good idea for calculating a quick sale percentage, tipping at a restaurant, or double-checking your math.A wearable smart watches worn on the wrist has comparable functionality and capabilities as a smartphone. Smart watches are designed to provide features such as accessing the internet, running mobile applications, making a call, communication via text or video, trying to check caller ID, accessing stock and climate updates, providing wellness monitoring capabilities, providing Gps location and position directions, and more, either on their own or when paired with a smart phone [3], [7], [8].

1.4 Smart phone as a mobile phone finder

Apps that help you find your phone are common, but since your watch is linked to your phone, being able to ring it right from your wrist is a great idea. As long as your phone is connected to your watch via Bluetooth, simply opening the app and tapping "Find!" on your watch will ring your phone. You can also use the app to set a notification that sounds on both your watch and phone when they are disconnected. That way, if you're about to leave the house without your phone but not your watch, you'll be warned before making a costly error (Figure 3).[9]

Figure 3: Illustrating the Applications on the smart watch same as the Phone.

The smart watches comprise of E-INK display as the battery life of an E-INK display is 5 days. Interface Touch interfaces are more intuitive to use, and many people use a mixture of touch and buttons. People who work out will benefit greatly from smart watches. Sensors are built into these devices that compute how many calories were expended, Traveled distance of the user, Speed, Pulse rate of the user and location of the user through GPS.

Elderly falls are one of the most difficult issues that public health systems must deal with. According to World Health Organization (WHO) statistics, falls are the second largest cause of accidental injury mortality after road traffic accidents. Adults over the age of 65 are by far the most vulnerable to this problem, since falls may have a significant effect on their well-being and self-sufficiency. According to WHO data, almost a third of individuals over the age of 65 die each year, and this number rises to 32% for those over the age of 70.

Following a fall, a significant percentage of undamaged elderly people (47 percent) are unable to stand up. Furthermore, even in the absence of severe damage, laying unsupported on the floor for more than one hour following a fall is related to a 50% mortality risk due to co-morbidities such as pneumonia, dehydration, hypothermia, or sores. In this context, telemedicine research on automated and cost-effective Fall Detection Systems (FDSs) based on wearable sensors has gotten a lot of interest in the past decade.

FDSs are used to distinguish between routine activities or ADLs (Activities of Daily Living) and movements that may be triggered by falls. The FDS is designed to send an alerting message or make a phone call to a remote help provider as soon as an accident is detected and a local alarm is not silenced by the monitored patient. Wearable FDSs are based on data collected by sensors (mostly inertial measurement units (IMUs)) carried by the patient directly. FDSs must be equipped with long-range wireless communication interfaces (such as cell phone connections) that allow them to function in an essentially ubiquitous manner, assuming that transmission system coverage is assured, in order to send the potential warning signals.

There are a variety of commercial wearables available now that are especially intended to detect falls (see, for example, the reviews presented ref. in for an analysis of the most popular products). These off-the-shelf gadgets, which are generally marketed as a pendant or bracelet, usually include a help button to summon assistance (a useless function if the patient remains unconscious after an accident). These alerting systems are primarily designed for in-home monitoring through specialized base stations connected to a landline. A monthly charge is needed to offer cell phone service when the customer wants on-the-go (ubiquitous) tracking, in addition to the cost of the detector and (in certain instances) the requirement for long-term contracts. Furthermore, in nearly all instances, the manufacturers do not provide information regarding the detection method used or how the detector was validated. As a result, the real efficiency of these systems for detecting falls has not been benchmarked (particularly when they are applied to the target population—the elderly).

Smartphones (SP) have been touted as a viable alternative to the costs associated with these specialized warning devices. The inertial sensor must, however, be securely connected to some place on the body (e.g.,

the chest, waist, or a limb) in order to get an acceptable characterization of the user's movement, which necessitates carrying the SP in an uncomfortable posture. In reality, if the phone is carried in a backpack or even a loose shirt or trouser pocket, smartphone-based FDSs may become unusable. To address this issue, related research has suggested that smartwatches be used, which may benefit from the cheap cost and widespread adoption of this technology, which was initially designed for fitness monitoring. Most smartwatches, like smartphones, include all of the hardware requirements of a wearable FDS: inertial sensors and wireless communications, into a single personal device (without needing any bulky elements that impair the user's comfort). Furthermore, today's smartwatches can be programmed and readily interfaced with other devices that have more processing capacity (mainly smartphones). The watch's position on the wrist also allows for the monitoring of key biosignals (such as pulse rate), which are also significantly influenced by any accident and may be used as an additional input signal for the fall detection algorithm. As a result, it's not unexpected that several popular smartwatches are gradually adding a "hard fall detection" functionality as a native feature.

The major issue with a smartwatch-based FDS is that analyzing wrist motions may lead to overestimates, or an excess of false alarms produced by the jerky activity of the arms and hands, which is not necessarily indicative of the rest of the body's mobility. As a result of the compensatory movements of the hands, the wrist exhibits a completely different mobility pattern during the fall when compared to measurements captured by other body positions, fall-related accelerometry signals may be misinterpreted more frequently as those originated by other ADLs and vice versa when the inertial sensor is placed on the wrist.

In fact, it has been shown that the optimum location for an inertial sensor targeted at describing human movement during a fall is the hip or waist, since they are closest to the body's center of mass. As a result, most fall detection wearables are intended to be worn around the waist, thigh, or chest.

The categorization based on a wrist sensor may even perform worse than those based on measurements taken on the ankle or knee. The results obtained when the watch is worn on the left arm are much better than those obtained when the watch is worn on the dominant right arm in these trials. The discrimination ratio of the watch-based fall detector obviously improves when the watch is connected to the waist or body trunk, according to the scientists (an illogical location for a wrist-watch).

A good fall detection system should therefore include a sensor that is not as susceptible to random and autonomous movements as the wrist. Nonetheless, using the wrist in an FDS isn't a waste of time. The effectiveness of an FDS based only on the signals gathered by a single sensor may be improved by combining the data recorded on the wrist and other body locations. Besides that, the signals measured by wrist-mounted inertial sensors have been integrated into several publicly available annotated data (see for a comprehensive review on this topic) that have been used as benchmarking tools for fall detection architectures based on multisensory systems or, at the very least, multiple inertial sensors. In this respect, there is widespread agreement that sensor fusion (or the integration of information given by several sensors) significantly enhances the effectiveness of FDS algorithms. As a result of the inherent constraints of an FDS based only on the usage of a wristwatch, a solution combining a smartwatch and one or more additional inertial units (placed on other parts of the user body) should be chosen. Smartwatches may serve as the central coordinator of this architecture with many sensing sites, eliminating the need for a smartphone or other portable (Holter monitor-like) node to receive and analyze the data from the sensors.

However, most smartwatches have significant battery and computational power limitations. In fact, autonomy, along with tiny displays, has long been seen as two of the most significant obstacles to wristwatch adoption in health monitoring applications targeted for the elderly. The amount of sensors and sampling rates used in a smartwatch have a direct relationship with battery consumption. As a result, the main limiting issue for the deployment and acceptance of apps that need continuous signal monitoring is the battery capacity (which is typically much lower than that of smartphones).

Most activity recognition systems would be jeopardized if the battery autonomy was less than 24 hours, since movement monitoring would have to be stopped before sleep to recharge the batteries. An extra fall detection (constantly running) program may have a significant effect on the battery life. In fact, according to a recent research based on questionnaires completed by respondents in a real-world testing of a worn fall sensor, consumers prefer devices that can operate for at least 6 months before needing to charge a battery.

DISCUSSION

Wrist-worn gadgets like as fitness trackers, activity tracker as well as health monitors, are examples of commercial wearable computers. As Smart watches grow more popular, providing communication capabilities in addition to activity and health monitoring, fitness tracking gadget sales are expected to decrease from 70 million in 2014 to 68.1 million in 2015. Smart Watches may be on the brink of becoming main stream with the introduction of the Apple Watch in early 2015. We examine commercially accessible Smart Watches, where adoption is still in its early stages. With the Smart watches accessing of the social network become faster. Smart watches reduce the number of times and effort of the user in pulling out phone. With the smart watches the calls and alerts are less likely to be missed. The features of the camera, Data may be synchronised with smart phones. Touch interface dominant makes easier to navigate, many use the mixture of touch and buttons are in the smart watches.[1], [10], [11]

CONCLUSION

The android wear smart watch is the "gadget to the mankind". In this paper we analyzed the battery duration of the smartwatches as a function of diverse operational conditions, depending on the sampling rate, the employed number of sensor nodes, the optional use of the smartwatch inertial and GPS sensors, and the alternative transmission of the captured signals to an external server, Various advantages of smart watches such as monitoring, computing mathematical, calculus and location tracking and, how it makes the user life convinient and flexible. We study that the only disadvantage of smart watches is that itis useless without the smart phones. Smartwatch includes personal monitoring devices and biosignal sensors that are natively incorporated in these wearables help in regular monitoring the health or wellness of the user.

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