The Future of Wearable Tech in India

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Introduction

DEFINITION OF WEARABLE TECHNOLOGY

There is a lot of hype for wearable devices these days. Wearable devices or wearables are electronic devices that can be worn over the body and have some practical utility. They can perform computing tasks similar to what mobile phones can do. They promise potentially great impact in fields such as health, fitness, and entertainment.

Wearables have found increased acceptance in the Western world, according to a Price Waterhouse Coopers Wearable Future report - in 2014, where one out of every five American adults owned a wearable device[1]. However, wearable tech has not met with the same success in Indian market. The focus of our project will be studying the contributing and inhibiting factors for adoption of wearable devices in India.

WHAT'S IN SCOPE

Currently, wearables have become synonymous with fitness trackers and smartwatches. There are various other types of wearables which are still in nascent stages. Overall wearables can be broadly categorized into six types –

1. Implantable
2. Smart Wrist wear
3. Smart Jewellery
4. Smart Clothing
5. Head-Mounted Displays

The scope of our project is limited to only those wearables that are supposed to be worn for most of the day, if not the whole day and those wearables that can be taken off easily. Therefore, we would be limiting our study to the following broad categories-

1. Smart Wrist wear
2. Smart Jewellery
3. Smart Clothing

Designing and marketing of any product or service is equally important. One cannot survive without another. However, we would be limiting our study to design of the aforementioned wearable categories to increase their adoption in India.

[1] https://en.wikipedia.org/wiki/Wearable_technology

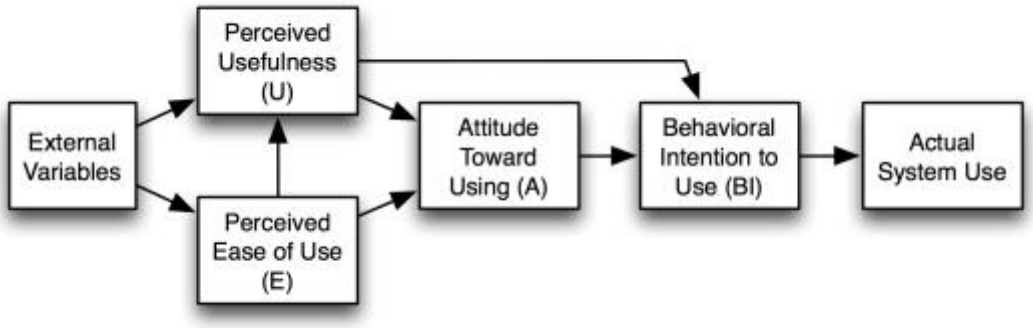
Critical factors influencing consumers

To understand the learning curve and usage curve of how consumers of wearable technology adapt to the new devices, we will be comparing various factors which influence the perceived usefulness (PU) and perceived ease-of-use (PEOU) of the products.

Fred Davis, in a journal article of MIS quarterly, defined PU and PEOU as follows: [2]

- **Perceived usefulness** (PU) – PU is "the degree to which a person believes that using a particular system would enhance his or her job performance".
- **Perceived ease-of-use** (PEOU) – PEOU means "the degree to which a person believes that using a particular system would be free from effort".

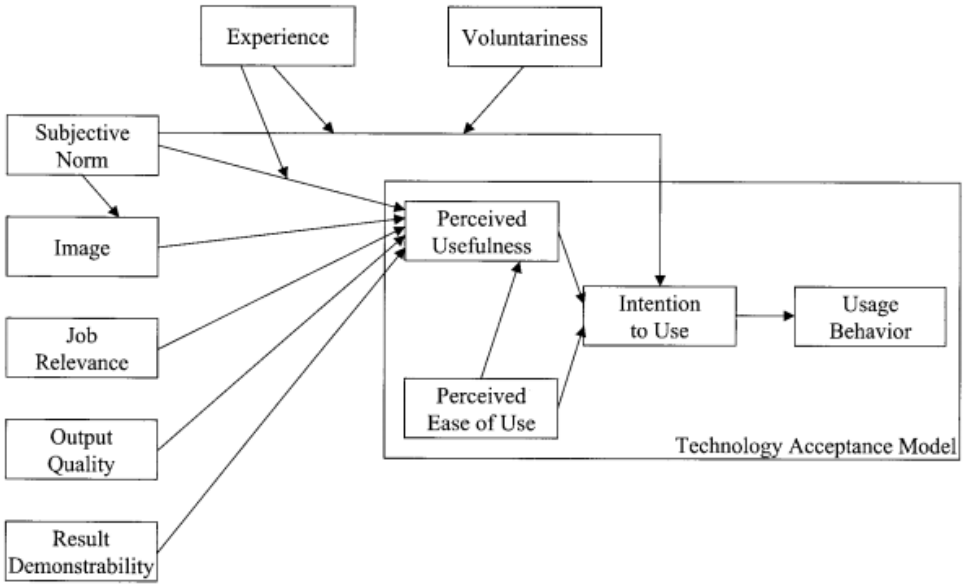
These factors were explained in an Information Systems theory called "Technology Acceptance Model (TAM)" by Davis, Bagozzi and Warshaw (1989). [3] The version 1 of the model is defined as below:



Over the years this model has been continuously analysed and extended. One of the major upgrades being TAM 2. [4]

[2] http://www.jstor.org/stable/249008?origin=crossref&seq=1#page_scan_tab_contents
[3] https://en.wikipedia.org/wiki/Technology_acceptance_model
[4] http://pubsonline.informs.org/doi/pdf/10.1287/mnsc.46.2.186.11926

Figure 1 Proposed TAM2—Extension of the Technology Acceptance Model



In the past decades, the rate of technological advancement has been increasing at an exponential pace. This has radically altered the diffusion process as to how the new products are communicated to the consumers, the purchasing habits of the users and the rate at which new technology is accepted. Thanks to the increased penetration of internet and communication technologies, the expectations of what a product is supposed to do have increased, with users' bare expectations being at a much higher benchmark, than what was there earlier. Now let us look at the various factors which will contribute to the PU and PEOU of the wearable technology products in Indian context.

RELATIVE ADVANTAGE

The rate at which users adopt a new technology product is directly proportional to the amount of relative advantage that they feel that the product with its set of attributes offers to them. If there is not a considerable rise in their perceived usefulness of the product, the adoption is either very slow, or stops altogether after the early adopters.

MOBILITY

In an interconnected world, people like to complete their tasks on-the-go. Thanks to the internet, there exist a plethora of devices which are connected to each other online and provide significant mobility to the users irrespective of their location.

With cloud storage becoming the de-facto storage system, it is essential to enable the consumers that the solution that the new product provides will be valid all across their daily schedule and the areas which they frequent.

Increased mobility adds to the perceived usefulness of the new product.

AFFECTIVE FACTORS

Sometimes, more than the actual utility of the device, specifically in case of digital devices where human interactions happen with a computer, the affective factors (feelings, emotions, cultural appeal associated with the product) have a significant impact on the individual's behaviour and acceptance of the product. It is much easier to use a product which "just feels right".

Since wearable devices are something which can be considered as an extension of one's personality, any high-value addition features which are overtly insensitive to the comfort of the wearer will not be popular.

The more positive the affective factors, the greater is the perceived ease-of-use.

AVAILABILITY

One of the standard expectations of digital and mobile devices today is that they're constantly up and running, almost 100% of the time. If the users have fast, continuous access to the information at hand, the sense of connectedness and proximity adds to the perceived usefulness of the product.

A product which is available "anywhere-anytime" is much likelier to shift consumer behaviour, than any of its counterparts. The peripheral services and promises accompanying the product need to follow the same model.

Availability of the new product (and its set of supplementary services) is directly proportional to both the perceived usefulness and the perceived ease-of-use.

COST

It is important to price your product just right as per the users you are marketing it to. If a product is perceived as expensive or unaffordable, then the purchasing behaviour of users will not lead to mass penetration. The cost of the product to the user needs to match the perceived value that they think they'll gain from its usage.

LEGAL FACTORS

Owing to the amount of highly personal data that the wearable devices collect from its user, it is important to encrypt that data and remove any personally identifiable information while storing it such that any loss of data to a malign third party doesn't lead to adverse effects on the users.

Additionally, there are various laws and regulations and compliance systems in place to ensure that the data of a country is not moved across another. So, for a product targeted at a specific region, it is important to ensure that you're legally compliant with all the rules of that region, as to where that data would be stored, what constitutes fair use and who owns the data.

Non-compliance to legal factors can severely damage the rate of diffusion for a new product.

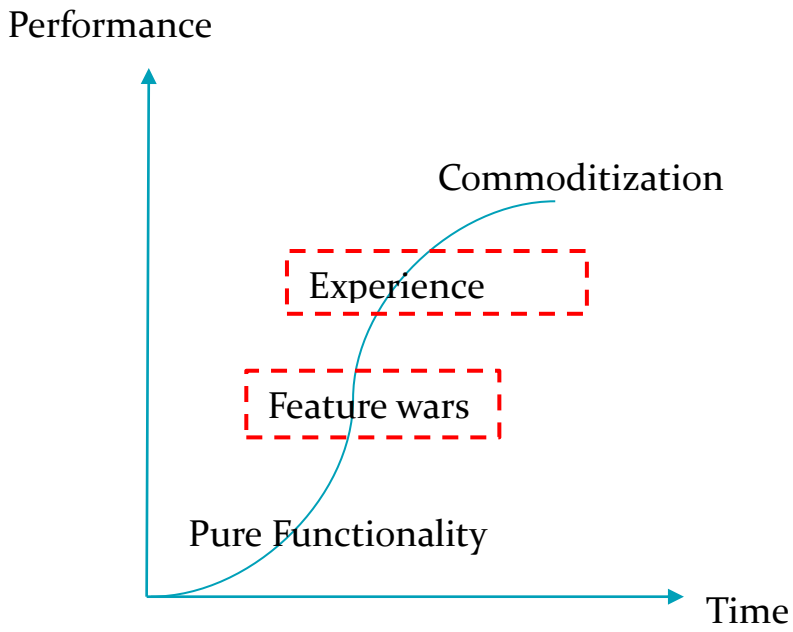
Current Indian Scenario

FITNESS BANDS

Fitness bands comprise 90% of the wearable market in India. In the fitness tracker segment, there are 3 main players in the Indian market – GOQii, Xiaomi and Fitbit with a market share of 21%, 10% and 5%. Fitbit also happens to be the global leader in this segment.[5]

Currently there are feature wars going in the industry with features such as heart rate, waterproofing, sleep monitor becoming the must-have features in entry level segments. To differentiate itself, GOQii is striving to control the end to end customer experience by providing expert personalized coaching, diet advice and online storage of health reports. Currently this industry is in the stage of feature wars and experience wars. There is a lot of influx of Chinese vendors in this segment, leading to lower price pressures. Eventually the next stage of the industry would be commoditization, unless players continue to add more features and experience.

[5] http://www.livemint.com/Technology/9I6p4AJRI29cN6D1nokrjJ/Wearables-market-growing-in-India-Goqii-remains-at-top-IDC.html



Others

SAFR is another wrist wearable tech for safety that connects to a smartphone and detects if a user has gotten into an accident. It can be configured to alert contacts in case of an emergency. 35,000 SAFR bands have been sold so far[6].

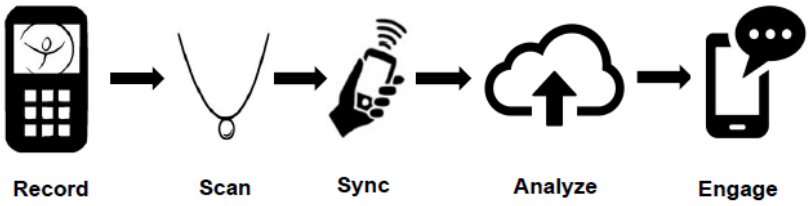
SMART JEWELLERY

Khushi Baby

Khushi Baby is a wearable tech for social impact, currently popular in rural villages of Rajasthan. It is basically a chip worn with a black thread. The chip holds the immunization records of the baby. Health workers have no idea about the vaccines given to the baby and hence don't know what vaccines are yet to be given to each baby. Data records maintained by NGOs is generally outdated. The parents are also not able to safely keep the vaccination records. In such a situation, the chip holds the vaccination data for each baby at the last mile. The chip can be read and updated using a mobile phone by the healthcare

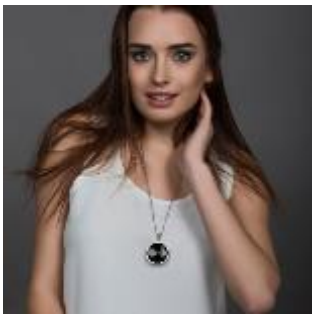
6 http://economictimes.indiatimes.com/articleshow/54494198.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

worker. This technology would soon impact 30,000 mothers and children across 600 villages.[7]



[8]

SAFER



SAFER is an app-enabled smart necklace for women safety. If the pendant is pressed twice, it sends SOS messages to emergency contacts. It also has a GPS location using which the friends and family can accurately track the location. It can also navigate you to the nearest hospital or police station. The firm is still in its early stages. However, the team has set itself a goal to sell 1 million pieces by the end of 2017[9]

Smart Clothing

This segment is still in its nascent stage, and much under-developed compare to smart wrist wear and smart jewellery. There are some start-ups who have ventured into this area. In areas such as fitness tracking, extra comfort, and self-cleaning clothing. Broadcast Wearables is one such start-up that has come up with smart sports-clothing that does the job of a fitness tracker.[10] Lumos has released a fabric that uses solar energy to charge your phone. Given that India is a tropical country, we could tap into the solar energy whenever outside. Another start up is Lechal, that has released soles which can turn any footwear into smart footwear. It tracks your

[7] *Khushi Baby Annual Report, 2016*
[8] *Khushi Baby Annual Report, 2016*
[9] http://money.cnn.com/2016/03/02/smallbusiness/india-women-safety-leaf-wearables/index.html
[10] http://iotindiamag.com/2017/02/smart-t-shirt-made-india-surfaces-wearable-market/

location using GPS, guides you in the right direction by sending vibration to your sole, using haptic technology and tells you which turn to take.[11]

DETERRING AND FAVOURING FACTORS FOR ADOPTION OF WEARABLE TECH IN INDIAN MARKET

According to Roger's model, following attributes contribute to the adoption rate of a new product -

1. Relative Advantage
2. Complexity
3. Compatibility
4. Trialability
5. Observability

The following section describes how each attribute will play – whether as a challenge or a favouring factor – for the adoption of wearable tech in India. The insights are based on the current products available in the market, and not what the products are going to be in the future.

1. Relative Advantage

   The different categories of wearable tech (wrist wear, jewellery) have provided an advantage over their alternatives. In many cases, there was no predecessor. For example, there was no device which could track your fitness data 24x7 and give you analysed results. In the case of Khushi Baby, even though there was a book-keeping alternative available, it proved to be tedious and not useful.

   Hence, wearable tech has a relative advantage, which would work as a favouring factor for its adoption

2. Complexity

   Complexity (or how difficult to use is the product) depends from product to product. A basic smart wristband is easy to use, however with added features it may cause feature fatigue. Similar is the case with smart clothing. However, smart jewellery has proved easy to use, from the examples given in the previous section. As per Accenture's report, 83% of the consumers

[11] http://economictimes.indiatimes.com/lechal-shoes-that-help-you-navigate-the-world/articleshow/55829201.cms

of intelligent devices find it difficult to use them.[12] The difficult could arise in setup or use.

Hence, the complexity of wearable tech can prove as both a favouring or deterring factor.

3. Compatibility

Most of the smart tech are configured with the smartphones. Since they do not require a specialized smartphone and the proliferation of smartphone in India is very high, hence smart tech is compatible with the existing social and tech systems. However, there are some exceptions such as Khushi Baby which require a specialized smartphone.

Overall, the smart tech products are compatible with the existing systems in India, making it a favourable factor.

4. Trialability

With smart tech products, one needs to pay for it upfront. There is no option to try and test a product for a limited period. However, if a smart tech offers a service with the product, there is an option to try it. For example, GOQii offers free personalized training for few months before asking people to pay for the service.

Overall, the trialability of smart tech wearables is low, making it a deterring factor.

5. Observability

One can observe the benefits of a smart tech easily and immediately. Smart wrist wear shows the fitness data as soon as set up. Similar is the case with other products i.e. smart jewellery and clothing. One may also be tempted to buy the product by watching someone else try out the product (Imitation effect).

Hence, the observability of wearable tech is high making it a favourable factor.

[12] http://www.financialexpress.com/industry/technology/wearable-technology-the-new-dress-code/81313/

Future of Wearable Technology in India

GAPS AND OPPORTUNITIES

Today, in the digital revolution happening around us, there exist many industries in which Wearable Technology can be applied. The devices which can be worn for an extended period of time enhancing customer satisfaction by delivering the value it has promised can be achieved by the following means. These devices should be smart and be connected to the internet to provide a seamless experience along with a basic independent processing power which enables it to present information in an ambient way, rather than just presenting the user with a entire raw data dump which can lead to cognitive overload and reduced usage of the device for a long time.

The key is to create value on the basis of daily usage and the users should not be interrupted in the implementation of his tasks. Feedback should be subtle and least obstructive to make it easier and convenient for the user to process the data at his own leisure. Wearables have the additional benefit of having the sensory data to determine what is the user's overall state of mind – if he is stressed or relaxed, and can provide the most appropriate response accordingly. As discussed, privacy of this very personal data has to be ensured and personalization should be provided such that the user feels a better connect with the way the data is presented. Templates, while easy for the developers to make, are not what the customer wants, and wearables should provide as many delighters as possible to ensure customer loyalty.

Wearable tech is currently at the peak of its "Hype Cycle" predicts Gartner, an IT analyst firm. Many other reports indicate a CAGR of greater than 50% for adoption of wearable technology, and only time will tell if they will really be breakthrough products or just become another niche market in the long run. However, Amazon launched its first wearables store recently, thus creating a new product category of 'wearable devices' for the average consumer. [13]

The Indian ecosystem is just experiencing the advent of wearable technology and while the initial focus is mainly on the fitness and healthcare sector, where the wearable device tracks and provides the data points regarding the health of the user, there is a lot of scope for innovation in the existing product line – such as gamification, introducing social incentives to encourage community / group

[13] https://www.cognizant.com/InsightsWhitepapers/wearable-technology-automotives-next-digital-frontier-codex1205.pdf

adoption as well as building an augmented product by providing a comprehensive set of services and charging based on usage.

There are lot of opportunities in the other sectors as well. We'll explain in detail in the last section how wearable devices can be used in the automotive industry at different stages of the buyer value chain, in the infotainment industry as well as the manufacturing industry.

To encourage consumer adoption, we recommend that the key players should target enterprises rather than the end consumer, as the user will be more willing to adopt a new tech if their employer pays for it, while the company can fund the purchase of wearable tech to enhance productivity and accountability amongst its employees.

POSSIBLE INCOMING DEVICES – PARTNERS AND CONDUCIVE INDUSTRIES

While there has been a plethora of wearable devices launched for the personal healthcare segment, there exists a lot of potential in the B2B segment – particularly for defence, automobile and medical sectors.

Defence

Hand-worn terminals, interactive head displays, smart clothing – these are some of the wearable devices which can be provided to the soldier to enhance their security and knowledge in the battlefield.

The key measure of success here is how interconnected these devices can be and how they can relay information effectively to the central server, which will process the bits and chunks it receives into actual, useful insights. In today's age of advanced weapons, it is all the more important to ensure the safety and comfort of the soldiers.

Interactive head displays will enable real time processing of enemy locations, which areas to avoid, what are the high-density locations of civilians and many other such scenarios where accidents and casualties can be avoided simply by fast and accurate dissemination of verified information.

To maximise the productivity of the military in all terrains and weathers, smart clothing can be an effective means of auto-regulating the temperature, providing proactive feedback to the soldier to keep himself hydrated based on his body temperature, blood pressure etc. The key challenge remains to make the unit cost low to ensure that the finances are not a major obstacle in the adoption.

Automobile

In general, there exists a lot of tacit knowledge in the automotive sector which can be codified with the help of devices to ensure that the entire process is human-agnostic. Right from the Quality Assurance checks to the automotive sales, wearable devices can be specialized to enable the respective employee to use them as 'cheat sheets' rather than relying on memory.

The application is quite simple wherein the wearable tech, say a smart glass can scan the barcode of the product and enable the user to perform end-to-end testing without any supervision. The device can simultaneously record data to ensure that all the steps have been carried out, which increases the accountability of the entire process as well. The salesperson can go through the particular product's key features without having to rely on memory and can address the user's query more effectively based on the large amount of dataset that the device will have access to.

Medical

This is a particularly attractive industry as there are a lot of funds already dedicated to the healthcare sector.

Continuous monitoring, unique identification of the patient, carrying all the basic essential information including the blood group, allergies etc. can help expedite the process of treatment in case of emergencies.

Similarly, the ongoing medical care can be optimized by the increased connectivity and information sharing between the hospital devices and the sensors attached to the patient's body. This can be an extended process even after the patient is no longer physically present in the hospital where the doctor will have access to the overall health parameters and can check for any spikes or irregularities and proactively reach out to the patient in case of any possible medical impediments rather than reacting to it afterwards.

Effective penetration will thus shift the healthcare from a curative pattern to a preventive pattern as our understanding of the human body and the correlation between symptoms and causes of various diseases increases with time.

HOW TO TAILOR FOR INDIAN CONVENIENCE

In the Indian context, the tech giants like Google, Apple, Samsung cannot afford to simply imitate what has worked in the western hemisphere and expect it to be an overnight success in the Indian market.

The firms need to probe a little, measure a little and continually keep updating the minimum viable product that the Indian consumer demands. Keeping in mind the price sensitivity, the perceived value of the device needs to be much, much greater than the actual cost of the device.

Offering a product service system like GOQii is doing might actually lead to brand loyalty by increasing the engagement of the user on the basis of the augmented service propositions provided. Personal fitness is a very lonely process and hence many of the devices see initial interest for a couple of months but then the usage drops down.

By identifying what job the device does for the user, these firms can pre-empt the user by catering to that job optimally. Because the user wants and needs can change, but the job to be done exists independent of all those factors. Glocalization, or bottom-up, India-first innovations are the way to break into the market and attain a sustainable competitive advantage.

This can only be achieved by a deep understanding of the usage and how to simplify the process of on-boarding a new device, how to assess the data results and what are the best ways to make sure that the consumer can capture value the device creates.

Wearables can be particularly useful in the Indian context of remote villages where the health facilities are not sufficient for the entire diaspora – the data can be relayed to the nearest district's health centre and the medical visits can be better utilized with the health staff coming in with some knowledge of the ailments that exist among the villagers rather than increasing the number of back-and-forth visits which will only degrade the overall experience of the patient.

Safety for women is a considerable issue in India and these devices can be used to silently relay SOS signals to the near and dear ones, which only require GPS and Bluetooth connectivity with smartphone devices, which most of the existing players already provide in their offerings. There need not be a separate device created for each purpose – just like smartphones have evolved to replace computers as the processing power has increased manifold over the past years, wearable technology can perform some of the modular tasks much more efficiently owing to the huge amount of data it has access to, while doing all this in a private, unrestrictive, convenient and consistent fashion.

The devices which enable the user to multi-task, are particularly robust and can endure prolonged usage with minimum maintenance, can't be lost easily, and

intuitive to the average Indian consumer will be the ones who capture the major market share amongst the current incumbent players.

At the same time, devices which are very expensive, uncomfortable to use and not ergonomically efficient, causing discomfort to the user thus dissuading continuous usage will result in the product not being able to catch on in the Indian context.

What is the exact future of wearable technology in India, only time will tell, but we believe the key players can differentiate their products by focussing on the Indian environment and understanding why Indians make the choices that they do, and then designing a high-quality, high-value wearable device around that concept.