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A Study of Users' Perception towards Smartwatches with Special Reference to NCR

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ABSTRACT

Now-a-days, smartwatches are gaining more popularity as they perform full mobile phone functionality right from keeping a track on the physical activities of a wearer to health monitoring and to making and receiving calls etc. Though, a lot many researches have been already happened and gained insights deeply into the concept but still, a lot can be undertaken. Here, in this research paper, we have made an attempt to study the perception of consumers (with special reference to National Capital Region i.e. NCR) towards the various issues of smartwatches. We have gathered and analysed data from 225 respondents on various parameters identified as characteristics of smartwatches. A well-designed questionnaire helped to get the data on demographic variables like gender, age, education, occupation and family income. Descriptive statistics and ANOVA are used as tools to analyse and interpret the data. It has found here that 81.8 percent of the respondents agree with"I intend to continue using smartwatch in future". 81.4 percent respondents agree thatsmartwatch has enhanced their ability to accomplish goals. About 74.2 percent respondents saythat smartwatches are no longer a luxury product. 69.8 percent respondents agree that smartwatches are overpriced but it has become a habit for me.

KEY WORDS

Smartwatch, Perception, Issues and Parameters.

INTRODUCTION

In the recent times, technological advancement has resulted in the invention of smart wearable devices and asmart environment. Currently, we have very new technological innovations that are connected to our day-to-day lives and make it smooth and much easier

than beforesuch as smartwatches, automated vehicles, smart shoes, smart buildings, and smart robots etc. (Milad& Ki, 2019).

A smartwatch is a modern computerised wristwatch loaded with a lot many attributes that go beyond time-keeping. These modern smartwatches are now termed as wearable computers which are capable of performing simple functions viz., calculations, computations, translations and game play. Wearable computers, as described by Starner (2014), are "any-body-worn computer that is designed to provide useful services while the user is performing other tasks" (Cecchinato, et al., 2015).Slowly and steadily, these wearables are entering into the mainstream of technology. Smartwatches have recently introduced several new features that allow them to act as a stand-alone computing device, whereas previously watches were heavily reliant on cell phones' connectivity. According to a study by (Jung, et al., 2016), display and stand-alone communication were both important factors in comparing options. Some of these computerised wristwatches do have full mobile phone functionality and are even able to make and receive calls and that is why, are termed as "dubbed watch phones".Watches now have an "e-sim" feature that allows them to listen to phone calls without having to keep their smartphones nearby.Smartwatches offer a variety of functions including fitness tracking, long battery life, voice response to messages, and the ability to connect to the internet wirelessly. Smartwatches 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. Some of the examples includes the use of smartwatches for Health & well-being (e.g., posture, fertility, or pain), Fitness (e.g., heart rate or step count in sport activities), Lifestyle & management (e.g., providing a map, notifying about incoming call or email) as well as Safety reasons (e.g., by sending a SOS alert automatically) (Pradthana&Jonna, 2019). Smartwatches incorporate multiple attributes, from being a computable device being to a fashion accessory (Jung, et al., 2016). Watches are moving in the same direction as smartphones because of technological development (Rawassizadeh, et al., 2015).Here, we can say that these smartwatches are amending human lives in the education sector, health-care sector etc. 360 degrees. This whole category of smartwatches has grown predominantly.

Smartwatch adoption only in the United States alone was increased to an all-time high of 14 percent between 2013 and 2018 (statista, 2021), as per recent report published by Deloitte. Another similar report published by strategic analytics in February 2020 highlighted that a

total of 30.7 million units of "Apple" smartwatches were shipped worldwide between 2017 and 2019 (statista, 2021). The future appears to centre on "wrist", where smartwatch & fitness tracker accounts for 95 percent of total wearable devices (statista, 2018). This figure is expected to rise in the years to come. The multi-applications of this smartwatch technology continue to attract many consumers worldwide to adopt this technology, thus providing us with the motivation to find out why smartwatch adoption is on the rise in recent times.

So, the emerging of new features in recent smartwatches also triggered us to investigate the current usage patterns. There is also little research around the phenomena of sustained use of smartwatch. So the objective of study is also to examine the issues of smartwatch which in return could help us to understand various perceptions.

REVIEWOF LITERATURE

Name of the Author (Year, Location)	**Title of the Paper**	**Sample size**	**Findings and Conclusions**
CarolinSiepmann and Pascal Kowalczuk (2012, Germany)	Understanding continued smartwatch usages: the role of emotional as well as health and fitness factors	335 respondents	This research study highlights that the individual who engage in self-quantification have an increased motivation to pursue their health and fitness goals. This paper suggests that the marketers must emphasize on these usages in their advertising campaigns. Moreover, "device annoyance" is found out to be an important barrier to continuous use of smart watches.
Neil Davie and Tobias Hilber (2016, Germany)	Smartwatch as a learning tool: A Survey of Students' Attitudes	124 students	The results of this paper indicates that both the smartwatch owners and non-owners are not overwhelmed and convinced with reference to educational purpose of the smartwatches.
Dr. P. Kishore Kumar and v. Venkateshwarlu (2017, Telangana, India)	Consumer Perception and Purchase Intention towards Smartwatches	130 respondents	This research paper highlights that the people who are aware about the smartwatches do actually have a positive purchase intention.
MeuelJeong, Kyeongjin Park and Kyungdoh Kim (2020, South Korea)	A Survey of what consumers want in Smartwatch Brand Applications	134 respondents	The results show that "Ease of Use is directly and positively correlated with Intention to use" and the "complexity" and "financial risk" are negatively correlated with the factor "intention to use".
Mr. ABI. D.S. and Dr. J. Rani (2022, India)	A study on Students' Preference on Smartwatches	106 respondents	58% of the respondents agree that the features of smartwatch are easy to use and understand while 57% respondents at the same time are considering its price as its disadvantage. A majority of the respondents i.e. 59% ask to make the smartwatch as water-resistant.

PURPOSE OF THE RESEARCH

Although presently, society at large is engaged into a variety of smart gadgets, but still the smartwatch is one of the dearest to them due to its easy to use features. Particularly, it is a form of wearable technology with some ubiquitous features that other smart items do not possess. We do agree that consumers have different and varied reasons for wearing a smartwatch as some find it beneficial to their health and fitness, while others find it enjoyable and socially acceptable. The aim of this research is to examine the users' perception with reference to smartwatch parameters. As a result, it would help to understand the sustainability of watch technology. In addition to this main objective, the research paper also emphasizes the perception of the wearer for the characteristics demographically. By doing so, this researchstudy would be able to gain insights into a few suggestions and implications regarding future of the market.

RESEARCH OBJECTIVES

The following are the research objectives of this study:

1. To understand the perception of the users towards smartwatches' issues, with special reference to NCR.
2. To know whether there exists a significant difference in the perception of users with respect to smartwatches' issues across the demographic variables or not.

RESEARCH METHODOLOGY

Research Design

Universe/Population

The term "Universe" comprises of all the elements that qualify to be included in the study of research. It includes all such sampling units from which a sample is to be drawn.

Here, in this research study, a researcher has no clear idea of the universe for the analysis that is infinite. Infinite population here consists of all those residents of NCR who use smartwatches.

Participants and Instrument Development:

Smartwatch adopters in NCR were our target population. Therefore, smartwatch users were approached randomly and with the help of one or the other respondents and invited to fill the well-designed and structured questionnaire. In this study, the sampling unit was the users of different brands of smartwatches located in NCR.

Sampling Technique Used

In this research study, Convenience and Snowball sampling technique was used so respondents could invite other potential participants such as friends and relatives who are also smartwatch users.

Data Collection:

The primary data was collected through questionnaire. The questionnaire was used to find out the perception of users for different issues or parameters of smartwatches.Approximately 250 responses were collected, of which 225 were retained for analysis. Participants were given a brief introduction to why the research is being undertaken so they know how their input would be used. The questionnaire clearly highlights that participation was optional with the possibility to withdraw at any time and that all the questions were multiple choice.

The first part of the questionnairecomprises questions pertaining to demographic variables of customers and second part of the questionnaire consists of questions related to Perception of users regarding different issues or parameters of smartwatches on likert scale.The secondary data were collected from journals, newspapers, magazines, internet and websites. The survey was created online as well as offline.

DATA ANALYSIS AND INTERPRETATION

Analysis and interpretation are the pivotal steps of the research process. The aim of the analysis is to organize, classify and summarize the collected data so that they can be better comprehended and interpreted to give answers to the questions that triggered the research. Interpretation is the search for the broader meaning of findings. Analysis is not fulfilled without interpretation; and interpretation cannot proceed without analysis. So, both are inter dependent.

RESEARCH HYPOTHESES:

In pursuance of the above objectives, the following hypotheses were formulated for testing:

H_{01}: There is no significant difference in the users' perception regarding different issues of smartwatches based on respondents' gender.

H_{02}: There is no significant difference in the users' perception regarding different issues of smartwatches based on respondents' age group.

H_{03}: There is no significant difference in the users' perception regarding different issues of smartwatches based on respondents' education level.

H_{04}: There is no significant difference in the users' perception regarding different issues of smartwatches based on respondents' income level

H_{05}: There is no significant difference in the users' perception regarding different issues of smartwatches based on respondents' occupation.

Table1: Demographic Profile of Respondents

Variable	Characteristics	Frequency	Percentage
Gender	Male	97	43.1
	Female	128	56.9
	Total	225	100
Age	Under 18 Years	11	4.9
	19 to 30 Years	89	39.6
	31 to 45 Years	87	38.7
	46 to 60 Years	31	13.8
	More than 60 years	7	3.1
	Total	225	100
Education	Upto 12th Class	16	7.1
	Graduate	53	23.6
	Post Graduate	99	44.0
	Ph.D. & Higher	57	25.3
	Total	225	100
Occupation	Student	70	31.1
	Job	99	44.0
	Business	13	5.8
	Professional	23	10.2
	Homemaker	12	5.3
	Retired	8	3.6
	Total	225	100
Family Income Per Month	Less than 50000 □	53	23.6
	50000 □ to 100000 □	59	26.2
	100000 □ to 150000 □	31	13.8
	More than 150000 □	82	36.4
	Total	**225**	**100**

Source: Primary Data

Table 1 indicates that 43.1 per cent of the respondents are males and 56.9 per cent are females. This reveals that the least composition of male respondents in consumer's

perception towards smartwatches in NCR. The variable age group shows that a maximum of 39.6 percent are from the age group of 19 to 30 years. The second largest group is aged between 31 to 45 years with 38.7 per cent of the total responses. About 13.8 per cent are aged between 46 to 60 years and 4.9 per cent are under 18 years of age. The lowest percentage comes from respondents who are aged above 60 years with only 3.1 per cent of the total data collected. So, it can be interpreted here that the respondents who belong to the age group of 19 to 30 years use smartwatch more than the users in the other age groups.

The demographic variable of educational qualification shows that majority of the respondents i.e. 44 per cent are having an educational qualification of Post Graduation followed by 25.3 per cent Ph.D or higher of educational qualification, 23.6 per cent respondents are graduate and 7.1 per cent are only 12^{th} passed as their educational qualification. This shows that majority of the smartwatch usersin our sample are Post graduate.

The occupation of the selected respondents shows 44 per cent are in job, 31.1 per cent are students, 10.2 per cent are professionals and 8.9 per cent are in other category of house wife/retired, unemployed etc.

The monthly income distribution indicates that 36.4 per cent are earning income more than □150,000, 26.2 per cent respondents are earning income between□50,000 to □100,000, 23.6 per cent are earning income upto □50,000 and 13.8 per cent of the respondents are earning incomebetween □1,00,000 to 1,50,000. This shows a good number consumers are distributed among all category of family income and consumers belonging higher income groups also respond positively.

CONSUMER PERCEPTION TOWARDS SMARTWATCHES'ISSUES

Smartwatch is a new modernised product in the Indian technology market. To know the perception of users about this product, some statements were framed for this study and respondents were asked to show their level of agreement for these statements ranging from strongly agree to strongly disagree.

Table 2: Respondents' views on the Agreement Level with Smart watch Issues

s.no.	Issues/Parameters	SA	A	NAND	DA	SDA	Total Score	WAS
1	Smartwatch has enhanced my ability to accomplish goals.	53 (23.6%)	130 (57.8%)	23 (10.2%)	15 (6.7%)	4 (1.8%)	888	3.95
2	Smartwatches are overpriced	56 (24.9%)	101 (44.9%)	26 (11.6%)	27 (12%)	15 (6.7%)	831	3.69
3	Smartwatches are not convenient for phone calls.	66 (29.3%)	81 (36.0%)	26 (11.6%)	32 (14.2%)	20 (8.9%)	816	3.63
4	Smartwatch screens have limited functionality.	36 (16.0%)	103 (45.8%)	28 (12.4%)	36 (16.0%)	22 (9.8%)	770	3.42
5	Fitness & health monitoring is sometimes unreliable.	44 (19.6%)	99 (44.0%)	34 (15.1%)	26 (14.7%)	22 (9.8%)	792	3.52
6	Smartwatches are no longer a luxury product.	59 (26.2%)	108 (48.0%)	19 (8.4%)	19 (8.4%)	20 (8.9%)	842	3.74
7	Smartwatches can be a source of distraction.	59 (26.2%)	61 (27.1%)	45 (20.0%)	32 (13.8%)	28 (12.4%)	766	3.40
8	The use of smartwatch has become a habit for me.	70 (31.1%)	87 (38.7%)	20 (8.9%)	31 (13.8%)	17 (7.6%)	837	3.72
9	Smartwatches have mostly unused features.	63 (28.0%)	72 (32.0%)	32 (14.2%)	40 (17.8%)	18 (8.0%)	797	3.54
10	I cannot imagine doing my task(s) without using my smartwatch.	36 (16.0%)	53 (23.6%)	26 (11.6%)	51 (22.7%)	59 (26.2%)	631	2.80
11	I wear my smartwatch only because it looks good.	65 (28.9%)	59 (26.2%)	23 (10.2%)	43 (19.1%)	35 (15.6%)	751	3.34
12	I prefer using my smartphone rather than smartwatch to perform my tasks.	59 (26.2%)	93 (41.3%)	29 (12.9%)	29 (12.9%)	15 (6.7%)	827	3.68
13	I intend to continue using smartwatch in future.	70 (31.1%)	114 (50.7%)	27 (12.0%)	10 4.4%)	4 (1.8%)	911	4.05
	Total Weighted Average Score = 3.53							

Source: Primary Data

***Data in parentheses indicate percentage of respondents.**

Table 2 clearly indicates that majority of the i.e. 81.8 percent respondents agree with "**I intend to continue using smartwatch in future"** whereas only 6.2 percent respondents disagree with the statement. Similarly 81.4 percent respondents agree with the statement"**Smartwatch has enhanced my ability to accomplish goals"**whereas 8.5 percent disagree with it. 74.2 percent smartwatch users agree that"**Smartwatches are no longer a luxury product"** whereas 17.3 percent deny with the statement.

Of the total respondents, 69.8 percent agree with the fact that "**Smartwatches are overpriced but the use of smartwatch has become a habit for me".** About 61.8 percent agree that "**Smartwatch screens have limited functionality".**The 63.6 percent respondents agree with the statement "**Fitness & health monitoring is sometimes unreliable".**60 percent respondents agree whereas 25.8 percentdisagree that"**Smartwatches have mostly unused features"**. Simultaneously 67.5 percent respondents are of view that "**I prefer using my smartphone rather than smartwatch to perform my tasks"**.

Table 2 also depicts overall weighted average score of 3.53 which highlights that smartwatch will prove a good product for Indian consumers.The statement "**I intend to continue using smartwatch in future"** has got the highest mean score of 4.05, followed by another statement "**Smartwatch has enhanced my ability to accomplish goals"** which got a mean score of 3.95.

From this score, we can understand the craze among users for smartwatch. Butat the same time, users are not totally dependent on smartwatch because the statement**"I cannot imagine doing my task(s) without using my smartwatch"**has lowest mean score 2.80.

Even though on the one hand, some respondents agree that"**Smartwatches are overpriced andSmartwatches have mostly unused features"** with an average score 3.69 and 3.54 respectively. But on other hand the weighted average score on the statement"**the use of smartwatch has become a habit for me" is** 3.72.

It can be inferred from the above scores that in the modern technological era, every person wants to be tech savvy. But being an Indian consumer of compromising nature we are not in the frontline to try each and every new technological product.

Table 3: One way ANOVA for Users' Perception towards the various issues of smartwatches across demographic variables

S.No.	Statements	Gender		Age		Education		Income		Occupation	
		T Value	Sig.	F Value	Sig.	F Value	Sig.	F Value	Sig.	F Value	Sig.
1.	**Smartwatch has enhanced my ability to accomplish goals.**	3.550	.061	1.486	.207	.269	.847	2.441	.065	.413	.840
2.	**Smartwatches are overpriced.**	1.145	.286	.388	.817	.597	.617	.541	.655	.550	.738
3.	**Smartwatches are not convenient for phone calls.**	1.533	.217	.694	.597	3.373	**.019**	1.208	.308	.556	.734
4.	**Smartwatch screens have limited functionality.**	11.526	**.001**	2.335	. 057	.693	.557	.258	.855	2.247	.051
5.	**Fitness & health monitoring is sometimes unreliable.**	.365	.546	.874	.480	1.058	.368	.746	.525	1.197	.312
6.	**Smartwatches are no longer a luxury product.**	4.183	**.042**	1.190	.316	.319	.812	.251	.861	.941	.455
7.	**Smartwatches can be a source of distraction.**	.104	.747	1.076	.369	.161	.923	.379	.768	1.030	.401
8.	**The use of smartwatch has become a habit for me.**	.308	.579	.083	.988	.067	.977	.562	.641	.567	.725
9.	**Smartwatches have mostly unused features.**	.231	.631	.806	.522	1.884	.133	1.669	.174	.453	.811
10.	**I cannot imagine doing my task(s) without using my smartwatch.**	1.671	.197	2.794	**.027**	1.020	.384	.386	.763	2.679	**.023**
11.	**I wear my smartwatch only because it looks good.**	.812	.369	2.587	**.038**	2.483	.062	2.459	.064	1.361	.240
12.	**I prefer using my smartphone rather than smartwatch to perform my tasks.**	.082	.775	1.147	.335	1.578	.196	.352	.788	.406	.844
13.	**1 I intend to continue using smartwatch in future.**	.921	.338	.836	.504	.631	.596	.742	.528	2.077	.069

Table 3 exhibits the ANOVA results whether the perception of users is significantly different with respect to their demographic variables. Here, in this table we have compared the p-value with 0.05. If the value is lower than 0.05 level of significance, then we conclude that there is a significant difference in the level of agreement of respondents with respect to issues of

smartwatches and vice-versa. **Gender-wise,** it is found that there are no significant differences in the perceptions for any dimensions of smartwatch except "Smartwatch screens have limited functionality" & "Smartwatches are no longer a luxury product". Similarly there is only one dimension that is significantly different when analysed on the basis of **age & occupation** and that is "I cannot imagine doing my task(s) without using my smartwatch". "I wear my smartwatch only because it looks good" is significantly different only on the basis of **age**. "Smartwatches are not convenient for phone calls." is significantly different only on the basis of **education**.

Since with respect to all the issues of smartwatches (except the five dimensions mentioned in previous paragraph) the significance level based on ANOVA computation is higher that 0.05, we accept all the null hypotheses H_{01} to H_{05}. This led to conclusion that there are no significant differences in the users' perception of different issues of smartwatches based on respondents' gender, age, income education and occupation except those mentioned in previous paragraph.

FINDINGS AND CONCLUSIONS

1. Of the total, 43.1 per cent of the respondents are males and 56.9 per cent are females.
2. It is found in the research study that the respondents who belong to the age group of 19 to 30 years use smartwatch more than the users in the other age groups.
3. It is highlighted that 44 percent of the total smartwatch users are post graduate.
4. The occupation of the respondents selected shows 44 per cent are in job, 31.1 per cent are students, 10.2 per cent are professionals and 8.9 per cent are in other category of house wife/retired, unemployed etc.
5. 81.8 percent respondents agree with "I intend to continue using smartwatch in future".
6. 81.4 percent respondents agree with the statement "Smartwatch has enhanced my ability to accomplish goals".
7. 74.2 percent smartwatch users agree that "Smartwatches are no longer a luxury product".
8. Of the total respondents, 69.8 percent agree with the fact that "Smartwatches are overpriced but the use of smartwatch has become a habit for me".
9. About 61.8 percent users agree that "Smartwatch screens have limited functionality".
10. The 63.6 percent respondents agree with the statement "Fitness & health monitoring is sometimes unreliable".

11. 60 percent respondents agree whereas 25.8 percent disagree that "Smartwatches have mostly unused features".
12. Simultaneously 67.6 percent respondents are of view that "I prefer using my smartphone rather than smartwatch to perform my tasks".
13. The statement "I intend to continue using smartwatch in future" has got the highest mean score of 4.05, followed by another statement "Smartwatch has enhanced my ability to accomplish goals" which got a mean score of 3.95.
14. It is also found here that gender-wise,that there is no significant difference in the perceptions for any dimensions of smartwatch except "Smartwatch screens have limited functionality" & "Smartwatches are no longer a luxury product".
15. Similarly there is only one dimension that is significantly different when analysed on the basis of age & occupation and that is "I cannot imagine doing my task(s) without using my smartwatch".
16. "I wear my smartwatch only because it looks good" is significantly different on the basis of age.
17. The respondents have significantly different perception on the issue stating "Smart watches are not convenient for phone calls" when analysed on the basis of education.

SUGGESTIONS

1. It is suggested here on the basis of research study that the price of the smartwatches must be rationalised and brought down a bit further.
2. Many respondents also suggested that all the smartwatches must be made water-resistant.
3. For females in particular, the designs and colours of the smartwatches must further be paid more attention.
4. The battery life of the smartwatches must be enhanced so as to make them suitable for long phone calls.

LIMITATIONS

Although every effort is made to undertake a representative study, the following limitations may have occurred in the study:

1. There may be **Drop error** i.e. the respondents that are willing as well as are able to provide vital information may not be contacted or included in the sample.

2. There may be **Go error** i.e. the respondents that are unable or unwilling to provide the information may be included in the sample.
3. There may be chances of different perceptions or the wordings of the questionnaire or scale. Since, this research is based on the primary data collected through online survey using google forms, where direct interaction between researcher and respondents was not possible.
4. The sample size of 225 respondents from NCRmay not be suitable to represent the true population.
5. This study also suffers from the shortage of time and resources.

FUTURE SCOPE OF THE STUDY

1. This research topic may be expanded and undertaken in Pan-India for the generalisation of the results.
2. Research on different brands of Smartwatches can be undertaken and hence, comparison can be done.
3. Level of satisfaction of users may be checked in terms of post- purchase behaviour.

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