Readiness to Adoption: Consumer–Provider Dynamics in Wearable Technologies

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Abstract

Purpose- This study aims to empirically investigate consumer readiness scale on wearable technologies usage by consumers and service providers in emerging markets. This study investigates the consumer preferences and service providers' preferences on consumer readiness scale.

Design/Methodology/Approach- This study conducted two phases of the study, phase 1- A structured questionnaire survey containing consumer readiness scale and for phase 2 – DEMATEL Method is applied based on the responses received from service providers (decision makers) of wearable technologies.

Findings- Results identified that there is a clear gap among consumers preferences on consumer readiness and provides focus on developing wearable technologies. Results also identified that role clarity is the prime focus of developers providing WTs to consumers.

Originality/Value- This study enriched the understanding and importance of consumer readiness to enable efficient use of wearable technologies.

Keywords – *Consumer Readiness (CR), Wearable Technologies (WTs), DEMATEL Analysis and Emerging Markets.*

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1 Introduction

In the present era, providing services to consumers has become challenging across multiple dimensions. Owing to rapid societal transformations and the continuous evolution of smart technologies, service providers increasingly face the complex yet achievable task of understanding their consumers (users) and enabling them to use services effectively. In the twenty-first century, innovation has increasingly gravitated toward smart and wearable technologies, as well as application (App)-based service delivery systems. This shift compels service providers to dynamically upgrade and redesign their offerings in order to match evolving consumer expectations and usage capabilities. From both provider and consumer perspectives, alignment is critical for mutual benefit and long-term service success.

At the same time, the rapid spread of digital health technologies has reshaped healthcare delivery into complex, interconnected ecosystems involving multiple stakeholders. Within these ecosystems, wearable health devices are no longer merely consumer products; rather, they operate as service touchpoints embedded within broader digital platforms, data infrastructures, and institutional arrangements. From a service-dominant logic perspective, value is not created by technology alone but emerges through continuous interactions among users, healthcare providers, technology developers, and regulatory actors (Vargo & Lusch, 2016). In emerging market contexts, where digital health solutions are often promoted as scalable responses to persistent healthcare gaps, the effectiveness of wearable technologies depends less on access or affordability and more on the quality of human–technology interaction and the readiness of users to meaningfully engage with these systems (Ostrom et al., 2021). Prior research in human–computer interaction and information systems consistently demonstrates that users' understanding of their role, sense of control, and motivational alignment play a central role in shaping technology adoption and its downstream effects (Rai et al., 2019; Burton-Jones & Grange, 2013). This is particularly critical in digital health settings, where inadequate readiness can disrupt sustained use, compromise data quality, and ultimately limit health-related outcomes. From a policy standpoint, global organizations such as the World Health Organization emphasize that digital health implementation in resourceconstrained contexts must be grounded in user-centered design, digital capability building, and trust-

enhancing mechanisms to ensure inclusive and responsible integration (WHO, 2019; WHO, 2023).

The importance of alignment between service providers and consumers has long been emphasized in relationship marketing and service research. For consumers, benefits of forming strong consumer–provider relationships include choice reduction (Sheth & Parvatiyar, 1995), confidence benefits (Gwinner et al., 1998), fulfillment of social needs (Berry, 1995; Gwinner et al., 1998), preferential treatment (Berry, 1995; Gwinner et al., 1998; Lacey et al., 2007), lower cost and effort (Peterson, 1995), reduced perceived risk (Berry, 1995), anticipation of service needs, and customized service delivery (Berry, 1995). Affect theory of social exchange further suggests that shared responsibility, inseparability, and service loyalty are interdependent outcomes of collaborative engagement between service providers and consumers (Lawler, 2001). Consequently, ensuring alignment between providers and consumers remains a prerequisite for service firms seeking sustained success in technologyenabled service environments.

According to Tehrani et al. (2014), technologies that can be attached as accessories and worn on the body are commonly referred to as wearable technologies. These include smartwatches (e.g., Apple Watch, Samsung Galaxy Gear), smart bracelets, fitness bands (e.g., Fitbit, Mi Band), and several other devices currently available in the consumer market. When integrated with smartphone applications, wearable technologies generate personalized user data, thereby creating opportunities for service providers to develop advanced applications and tailored service offerings (Maisto, 2013). At present, wearable technologies are widely used in fitness and healthcare-related services, commonly referred to as wearable fitness technologies (WFTs) (Chan et al., 2012). Fitness-related wearables enable users to track daily activities such as step count, distance walked, calories burned, sleep patterns, heart rate, blood pressure, and dietary behavior, whereas healthcare-focused wearables are used for patient monitoring, emergency response, and location-based sensing.

Over the past decade, researchers have increasingly examined factors influencing consumer adoption and usage of wearable technologies. Mishra et al. (2018) argue that the Technology Readiness Index (TRI) 2.0 requires refinement to account for cultural diversity across developed and developing markets. Building on this view, consumer readiness (CR) has emerged as a key construct, defined as an individual's predisposition or state of mind toward using a new technology (Liljander et al., 2006). Prior studies by Kim et al. (2012), Liljander et al. (2006), Lin and Hsieh (2006), Meuter et al. (2005), Tsikriktsis (2004), and Parasuraman

(2000) have extensively examined consumer readiness in the context of self-service technologies (SSTs), particularly in online and mobile service settings such as mobile banking and electronic reservation systems.

While adoption models such as the Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), and Technology Acceptance Model (TAM) have been widely used to explain behavioral intentions, they do not adequately capture the stages of technology adoption or the experiential challenges faced by consumers during initial use (Lee, 2018). This limitation is particularly relevant in emerging markets, where consumers may experience fear, discomfort, or uncertainty when interacting with new technologies (Parasuraman, 2000; Lin & Hsieh, 2006). Wearable technologies, like SSTs, are primarily operated by individuals themselves and rely heavily on direct consumer–technology interaction, with minimal human assistance.

To better understand the barriers consumers face during initial interaction with wearable technologies, this study examines the cause–effect relationships among consumer readiness dimensions during first-time use of wearable technologies, as conceptualized by Meuter et al. (2005). To enhance methodological rigor, the study adopts a two-step approach. First, consumer-preferred items of consumer readiness are identified. Second, a causal-effect relationship among readiness factors is established using DEMATEL analysis based on service providers' perspectives (refer Figure 2). Through this dual-perspective approach, the study seeks to uncover service gaps arising from misalignments between consumer readiness and provider assumptions in the context of wearable technologies.

2 Literature Review

2.1 Consumer Readiness

Consumer readiness is defined as the condition or state in which a consumer is likely to use an innovation for the first time (Meuters et al., 2005). According to Bowen (1986), processing consumer readiness on high levels is likely to lead to the use of new technology, on other way low level of processing leads to lower chance of usage. Consumer readiness is conceptualized as role clarity, ability and motivation (external and internal) and is derived from human resources management literature (Schneider and Bowen, 1995; Bowen, 1986). Role clarity refers to the knowledge of the consumer and understanding on what to do; ability refers to the capability/skills required by a consumer to perform required task on the technology; motivation refers to the desire to operate, learn and receive rewards on the technology. Understanding readiness of a consumer on these four concepts is important to increase the usage and adoption

of new technologies. Researchers like Meuters et al. (2005) and kim et al. (2012) have studied consumer readiness and its effect on SSTs. Kim et al. (2012), studied consumer readiness and individual differences on likelihood of using new SSTs in hospitality industry and concluded that extrinsic motivation of a consumer is most significant on likelihood to use new SSTs (e.g kiosks and touch screen tablets were used to order food and other services in hotels), followed by intrinsic motivation and then role clarity whereas ability is generally not seen as an important factor to determine the readiness of consumer. Like any SSTs where the consumers/users are expected to perform their task on their own and with the help of kiosks assistance and no one else, wearable devices also feature the same way of expectation from a user. Thus, understanding readiness of consumer on adoption of wearable technologies through the factors like role clarity, ability and motivations are appropriate to study.

2.1.1 Role Clarity (RC): It refers to how well an individual understand the role or performance required to adequately claim or produce a service using a technology (Kim at al., 2012). A study by Easingwood (1986) found that more than 89% of firms reported issues related staff or customer confusion because of the role clarity, in relation to the new product or services. When consumers do not know or understand what to do with the device are more likely not to try the new device. Larson and Bowen (1989) in their study stated that participants are constrained by insufficient clarity about the understanding of his/her role as a consumer in the service process. Thus, in order to try or use WTs, it is required to understand the effect of clarity of role by the consumers.

2.1.2 Motivation –Intrinsic (IM) & Extrinsic (EM): If the technology enables a consumer to desire to operate a device or collect some form of reward, then the technology is considered to motivate the individual. Motivation is considered to occur in two ways namely intrinsic and extrinsic. According to the study by Larsson and Bowmen (1989) and Vroom (1964), willingness to perform a task depends on the level of motivation a customer or an employee has in the production of services. Meuters et al (2005) stated that both extrinsic and intrinsic rewards influence consumers to try SSTs. Barczak et al. (1997), in their study also stated that motivation is a key predictor for determining the use of technology based products and services. If a consumer derive their desire to try a device based on external factors like coupons, discount, price, time saving or other external advantage then it constitute Extrinsic Motivation (EM) (Dhabholkar, 1996) and if the consumers derive their desire to try the device based on internal factors like accomplishment, prestige, pleasure personal growth and other internal factors then it constitutes to Intrinsic Motivation (IM), and these intrinsic factors were studied in SSTs

(Rogers, 1995; Becker, 1970). In this study, we expect that both intrinsic and extrinsic motivations are important factors for enabling a consumer to try wearable technologies.

2.1.3 Ability (AB): If a consumer has necessary confidence and skill to perform a task, then it is referred to as ability (Jayanti and Burns, 1998; Jones, 1986). In general, ability refers to what an individual "can do" rather than what he or she "wants to do" or "knows how to do" (Ellen et al., 1991). In literature, self-efficacy research has shown that competent behavior of an individual in a situation requires both skills and belief in one's self. Low self-efficacy is more often seen when performing complex tasks, but even relatively simple tasks have shown creating the feeling of inability (Ellen et al., 1991). According to Hoffman and Novak (1996), proposed that perceived confidence to engage in a task influences behavior in a computermediated environment. Thus, it is as important to understand the ability of a consumer when he or she is interacting with it in an environment. So, we expect that there is a significant, positive relationship between ability and trial behavior of wearable technologies. Thus, this study included the factor ability in consumer readiness.

2.2 An affect theory of social exchange (Lawler, 2001): Service providers and Consumers.

The current study focuses on the perception of service providers and consumers and the values they derive from one another in the usage process. Lawler (2001) posits that affect theory of social exchange shows social relationships has the source of emotions, and attempts to characterize the emotional effect of different exchanges. Social exchange theory construes joint activities varying based on the degree of jointness (i.e shared responsibility) where in joint activities involve at least two parties and their shared responsibility is the outcome both parties are accountable for. This theory explains that the greater the shared responsibilities between two parties, the stronger the emotions people will attach to the unit of exchange (Lawler, 2001). Thus, social exchange theory depicts that a successful/unsuccessful service encounter with a service employee will positively/negatively impact a customer's view of the entire service firm (Sierra & Mcquitty, 2005). When customer input (Parasuraman et al, 1985) and interaction (Gronroos, 1978) increase to make service exchanges successful, which means customers and service firms depend on each other for a service firm's success (Lawler, 2001; Solomon et al, 1985) though their shared responsibility may vary across service rendered. This confirms that the perception of the service providers and consumers have to align similarly for the firm to succeed in the long run. Thus, the study aims to understand the perspective of service providers and consumers on consumer readiness validated from the affect theory of social exchange.

3 Conceptual Model

These two conceptual frameworks work together to offer a readiness-focused understanding of how people adopt wearable technology, addressing key gaps in widely-used models like the Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), and Technology Acceptance Model (TAM). While these established theories have been helpful in explaining why people intend to use technology, they tend to treat adoption as a one-time decision driven mainly by cognitive reasoning. What they miss are the lived, experiential stages that come after initial interest—like actually trying the device, using it regularly, and eventually committing to it. These stages are especially important for technologies like wearables that people operate themselves and that generate substantial amounts of personal data (Rogers, 2003; Venkatesh et al., 2012). Our framework takes a different approach by viewing consumer readiness—which includes understanding one's role, having the necessary skills, and feeling both externally and internally motivated—as an evolving capability that influences not just how consumers behave but also how services should be designed.

Building on important earlier work by Parasuraman (2000) and Meuter et al. (2005), and responding to recent calls to focus on effective technology use rather than just adoption (Burton-Jones & Grange, 2013; Rai et al., 2019), we see consumer readiness as essential for meaningful engagement with self-service and wearable technologies. This is particularly true in emerging markets where people's digital skills and experience vary widely. The first model draws on service-dominant logic to emphasize that value is created together through the alignment between how ready consumers are and what service providers assume about them, rather than value being built into the technology itself (Vargo & Lusch, 2016; Ostrom et al., 2021). By combining consumer preference analysis with causal analysis from the provider's perspective, this model reveals service gaps that emerge when different stakeholders have mismatched perceptions of readiness.

The second model builds on Rogers' (2003) classic innovation diffusion theory by positioning consumer readiness as a bridging mechanism that connects innovation features and individual characteristics to the various stages people move through—from first becoming aware of the technology, to evaluating it, trying it out, using it repeatedly, and finally committing to it longterm. Recent research in digital health and how people interact with technology confirms that readiness-related factors like feeling in control, understanding what's expected of you, and trusting the technology are crucial for continued engagement and reliable data, yet these factors haven't received enough attention in traditional adoption theories (Sharon, 2020; Dwivedi et

al., 2020). Together, these frameworks reframe wearable technology adoption as an ongoing, relational process, showing that successful value creation depends not just on people having positive attitudes or good intentions, but on maintaining alignment between consumers and service providers throughout their journey within digital health ecosystems.

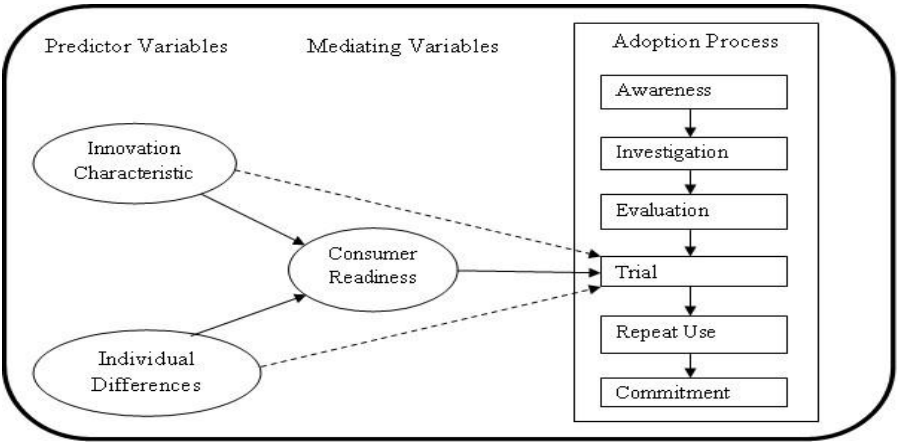

Figure 1: Consumer Readiness – its predictor and relationship to Adoption Process.
Source: Adapted for the study Meuters et al (2005) for reference to this study.

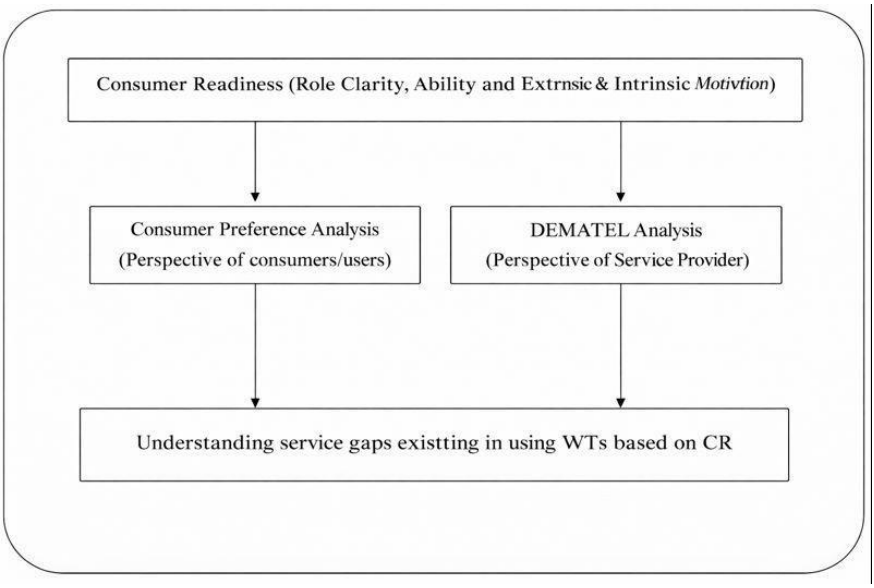

Figure 2: Flow Chart of this study
Source: Developed by author for this study.

4 An empirical analysis of Consumer Readiness (CR)

There are four major factors that determine the readiness of a consumer, while adopting a wearable technology. It is necessary to understand the perspective of a consumer based on his readiness to use a technology as well as to cross verify from providers about their perspective to identify the barriers to such adoption. Thus, these gaps will be the base to enhance the use of WTs in emerging markets. In order to bring rigor in enhancing the factors of consumer readiness, this study includes two phases: Phase 1 aims at identifying key factors of consumer readiness through consumer preference analysis and in phase 2 the DEMATEL analysis was conducted for consumer readiness instrument to establish a cause and effect relationship among the perspectives.

4.1 Questionnaire and Sampling

The purpose of this study is to identify the perspective of consumers based on the factors of consumer readiness (i.e role clarity, ability, internal and external motivation). Consumer preferences on readiness factors are found based on a questionnaire survey taken from 300 respondents out of which 275 were received back, wherein 5 were excluded because of missing data, thus a total of 270 completely responded questionnaires were included for this phase of the study. A questionnaire containing 12 items representing 3 items each on role clarity, ability, internal and external motivation respectively. The coding was done using the method as explained in the study by Kim et al (2012) (refer to Table 3). The responses were sought on a 7 point Likert scale wherein 1 refers to “Strongly Disagree”, 2 refers to “Disagree”, 3 refers to “Somewhat Disagree, 4 refers to “Neutral”, 5 refers to “Somewhat Agree”, 6 refers to “Agree” and 7 refers to “Strongly Agree”. Purposive sampling was used to select the respondents in and around Delhi NCR. The demographic profile of the respondents for the survey can be referred from Table 1. The Cronbach’s alpha for the 12 items is 0.829, shows strong internal consistency among the scale and also confirms reliability. The Kaiser-Maeyer-Olkin (KMO) value of the instrument shows adequate index between 0-1 with value 0.786, which is a moderate value indicating that the study represents a moderate relation among the items, which is far better than the recommended value 0.6.

The measurement scale demonstrates satisfactory reliability, with a Cronbach’s alpha coefficient of 0.829, indicating strong internal consistency among the 12 items. In addition, the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy is 0.786, reflecting sufficient

shared variance among the items, which exceeds the recommended minimum threshold of 0.60, the data are deemed appropriate for subsequent multivariate analyses.

Table 1: Demographic Variables – Age, Gender & Occupation.

Demographics	Categories	Frequency	Percentage (%)
Age	21-30 yrs	140	51.85
	31-40 yrs	82	30.37
	Above 41yrs	48	17.77
Gender	Male	162	60.0
	Female	108	40.0
Occupation	Post Graduate Students	200	72.7
	Salaried	70	25.5

Source: Developed by author for this study.

4.2 Phase 1: Consumer Preference Analysis

Based on the Table 2, it is depicted that the values (mean) of consumer readiness scale are in the range of 5.60-4.58. Respondents have expressed that they prefer wearable technologies to be within the scope of their ability with mean value 5.60 and they express a feeling of independence to be the least preferred perspective with mean value 4.59. The mean values of consumer preference, from Table 2 is considered to remain in the strong range of more than 4 thus, it is reasonable to consider all the items of consumer readiness scale to be strongly preferred by respondents on wearable technologies. Based on the preferential values, it is then prioritized the items of consumer readiness in the order of maximum and minimum consumer preferential values for preferring wearable technologies.

As shown in Table 2, the mean scores for consumer preference are consistently above 4, reflecting a strong overall inclination toward wearable technologies. This indicates that respondents generally exhibit a high level of readiness across all items of the consumer readiness scale. Based on these preference scores, the items are then ordered from highest to lowest to highlight the aspects of consumer readiness that are most and least strongly endorsed.

Table 2: Consumer readiness perspectives and consumer preference (mean).

Items	Perspectives	Consumer Preference (Mean)
f1	Understandable Instructions	4.8864

f2	Expected of consumer	4.7927
f3	Clear Process of using	4.8436
f4	Capability to Use	5.1745
f5	Confident to use	5.3709
f6	Within Scope of Consumer Ability	***5.6036 (highest)***
f7	Convenience in using WTs	5.3055
f8	Able to Use Fast	5.2226
f9	Access Anytime	5.2945
f10	Feel of accomplishment	4.9927
f11	Feel of enjoyment	5.0145
f12	Feel of Independence	***4.5855 (low)***

Source: Developed by author for this study.

4.3 Phase 2: Measuring the relationship among the Consumer Readiness Scale

In this phase DEMATEL analysis is performed for consumer readiness to establish a cause and effect relationship among the items based on the study (Tseng et al., 2007). The Founder/CEO, product development head, product managers and employees performing a vital role in the application development for the Service provider company of mobile health application were the respondents for DEMATEL analysis. A total of 11 respondents were approached for response out of which 9 responded back. Thus, 9 respondents data matrix is included in the study. For the easy understanding of respondents and to fit in the matrix questionnaire, consumer readiness items were coded in a specific form (refer Table 1). DEMATEL method establish a causal relationship with in the factors and sub-factors (Wu, 2008). There are 4 major steps involved in DEMATEL Analysis and finally causal relationship with a graph representing the threshold factor and a causal diagram.

Table 3: Consumer Readiness Instrument – Coded form

Consumer Readiness Instrument	**Coded Form**
RC1: Usually there are understandable information available, regarding WTs	Understandable Instructions
RC2: I know what is expected of me if I use wearable technologies	Expected of consumer
RC3: The steps in the process of using WTs are clear to me.	Clear Process of using
AB1: I believe I am fully capable of using WTs	Capability to Use
AB2: I am confident in my ability to use WTs.	Confident to use
AB3: Using WTs is well within the scope of my abilities.	Within Scope of Consumer Ability
EM1: With my lifestyle, a device that could analyse my physical fitness is desirable.	Convenience in using WTs

EM2: With my lifestyle, a device that could easily store and analyse my everyday activity is desirable.,	Able to Use Fast
EM3: With my lifestyle, a device that could be portable and innovative is desirable.	Access Anytime
IM1: When I think of using WTs for my physical fitness, a personal feeling of worthwhile accomplishment is desirable.	Feel of accomplishment
IM2: When I think of using WTs, a personal feeling of enjoyment (e.g., cool and fun) is desirable.	Feel of enjoyment
IM3: When I think of using WTs, a feeling of independence is desirable.	Feel of Independence

Source: Developed by author for this study.

4.5 DEMATEL ANALYSIS

The procedure for DEMATEL analysis is discussed below based on the studies of (Tseng et al., 2007 & Wu, 2008).

Step 1: In this step average matrix $A = \square a_{ij} \square$ is computed. The response received from each responded in the matrix based on the score ranging from 0,1,2 and 3 representing "no influence", "low influence", "medium influence" and "high influence" respectively. The notion Xij indicates the degree of the respondent's belief on the factor i affecting factor j. For all i=j the diagonal elements are considered to be zero. For each response, a nxn non negative matrix is established in the form of X^k=[Xij^k], where k refers to the number or respondents with 1≤k≤H, and n is referred to as number of factors in the matrix. Thus X^1, X^2, X^3, . . ., X^H are the matrices based on the respondents H. Thus, an average matrix A = [aij] can be derived as (refer Table 4)

Table 4: Calculating the Average Matrix

	f1	**f2**	**f3**	**f4**	**f5**	**f6**	**f7**	**f8**	**f9**	**f10**	**f11**	**f12**
f1	0.000	1.714	2.429	2.286	2.286	2.000	2.143	2.143	1.571	1.571	1.714	1.571
f2	2.000	0.000	2.571	2.143	2.000	2.143	2.571	2.000	2.000	1.857	1.714	1.571
f3	2.286	2.429	0.000	2.571	2.286	2.000	2.571	2.286	1.714	1.571	2.000	1.571
f4	1.857	1.714	2.000	0.000	2.143	2.286	2.286	2.286	1.571	2.000	2.000	1.857
f5	1.571	2.000	1.714	2.429	0.000	2.000	2.000	2.429	1.857	1.571	2.143	1.714
f6	1.286	2.000	1.714	2.000	2.286	0.000	2.2857	2.143	1.857	2.143	2.143	2.000
f7	1.714	2.000	1.857	2.143	2.429	2.571	0.000	2.429	2.571	1.429	2.000	2.000
f8	1.286	2.000	2.000	1.857	2.286	2.000	2.2857	0.000	1.857	1.571	2.286	1.714
f9	0.714	1.857	2.000	1.714	2.143	2.429	2.2857	2.143	0.000	1.857	2.286	2.143
f10	1.000	1.571	1.143	1.571	1.714	1.857	1.4286	1.857	1.714	0.000	2.143	2.143
f11	0.857	1.429	1.143	1.286	1.571	1.429	1.000	1.714	1.143	1.429	0.000	1.571
f12	0.571	1.143	1.286	1.143	1.714	1.571	1.286	1.714	1.857	2.000	2.143	0.000

Step 2: In this step normalized initial direct-relation matrix [D] is calculated by D=A*S, where S=1/max (formula). Each element in the below matrix D considered to fall between 0 and 1. (refer to Table 5)

Table 5: Calculation of D =A*S

	f1	f2	f3	f4	f5	f6	f7	f8	f9	f10	f11	f12
f1	0.000	0.074	0.104	0.098	0.098	0.086	0.092	0.092	0.067	0.067	0.074	0.067
f2	0.086	0.000	0.110	0.092	0.086	0.092	0.110	0.086	0.086	0.080	0.074	0.067
f3	0.098	0.104	0.000	0.110	0.098	0.086	0.110	0.098	0.074	0.067	0.086	0.067
f4	0.080	0.074	0.086	0.000	0.092	0.098	0.098	0.098	0.067	0.086	0.086	0.080
f5	0.067	0.086	0.074	0.104	0.000	0.086	0.086	0.104	0.080	0.067	0.092	0.074
f6	0.055	0.086	0.074	0.086	0.098	0.000	0.098	0.092	0.080	0.092	0.092	0.086
f7	0.074	0.086	0.080	0.092	0.104	0.110	0.000	0.104	0.110	0.061	0.086	0.086
f8	0.055	0.086	0.086	0.080	0.098	0.086	0.098	0.000	0.080	0.067	0.098	0.074
f9	0.031	0.080	0.086	0.074	0.092	0.104	0.098	0.092	0.000	0.080	0.098	0.092
f10	0.043	0.067	0.049	0.067	0.074	0.080	0.061	0.080	0.074	0.000	0.092	0.092
f11	0.037	0.061	0.049	0.055	0.067	0.061	0.043	0.074	0.049	0.061	0.000	0.067
f12	0.025	0.049	0.055	0.049	0.074	0.067	0.055	0.074	0.080	0.086	0.092	0.000

Step 3: In this step, total relation matrix [T] is calculated by [T]= D(I-D)^-1, where I is identity matrix. R and C are defined as nx1 and 1xn vectors representing the sum of the rows and sum of the columns of total relation matrix T, respectively (refer to Table 6) ***Table 6: Calculation of T=D*(I-D)^-1***

	f1	f2	f3	f4	f5	f6	f7	f8	f9	f10	f11	f12
f1	0.454	0.653	0.673	0.706	0.753	0.727	0.728	0.756	0.643	0.621	0.726	0.645
f2	0.556	0.615	0.708	0.733	0.776	0.766	0.777	0.785	0.689	0.660	0.760	0.676
f3	0.580	0.726	0.626	0.766	0.806	0.779	0.795	0.815	0.695	0.666	0.789	0.692
f4	0.533	0.661	0.665	0.625	0.757	0.746	0.741	0.771	0.652	0.645	0.747	0.665
f5	0.511	0.657	0.642	0.704	0.657	0.721	0.716	0.760	0.648	0.616	0.736	0.646
f6	0.506	0.665	0.648	0.696	0.754	0.650	0.734	0.758	0.656	0.645	0.745	0.664
f7	0.550	0.702	0.691	0.741	0.802	0.791	0.686	0.811	0.719	0.654	0.781	0.701
f8	0.495	0.650	0.644	0.676	0.737	0.712	0.718	0.657	0.641	0.609	0.733	0.638
f9	0.478	0.652	0.650	0.677	0.740	0.736	0.725	0.749	0.575	0.627	0.742	0.662
f10	0.416	0.549	0.527	0.574	0.620	0.613	0.592	0.633	0.551	0.466	0.634	0.571
f11	0.345	0.457	0.442	0.473	0.516	0.500	0.481	0.528	0.444	0.440	0.451	0.462
f12	0.365	0.489	0.488	0.512	0.569	0.553	0.537	0.576	0.513	0.502	0.584	0.442

Step 4: Ri is the sum of all the values in the ith row in matrix T, then Ri summaries both direct and indirect effects given by the factor i to other corresponding factors. Cj denoted the sum of jth column form matrix T, and then Cj represents both direct and indirect effects of jth factor by its other corresponding factors. When i=j, the sum (Ri+Cj) shows the total effects given and

received by factor i, that is, Ri+Cj indicates the degree of importance of the factor i in the overall system. Whereas, the difference Ri-Cj indicates the net effect that factor I contributes to the system and If Ri-Cj is positive then factor i the net cause and if negative, then factor i is the net receiver. (refer to Table 7)

Table 7: Calculating the Sum and difference of cumulative Rows and Columns

Perspectives	Rij+Cij	Rij-Cij
f1	13.87419	2.29866
f2	15.97608	1.023021
f3	16.13899	1.330746
f4	16.0922	0.325108
f5	16.50289	**-0.47456**
f6	16.41497	**-0.17296**
f7	16.85945	0.400189
f8	16.50972	**-0.68974**
f9	15.43727	0.587225
f10	13.89575	**-0.40673**
f11	13.96766	**-2.88848**
f12	13.59494	**-1.33247**

Step 5: The threshold value is calculated based on the average of elements form table 3, matrix T. The average value of tij (α) = 0.64328, which includes too many factors and a complex relationship graph, thus forming of causal relationship at α=0.64328 is not viable. So in order to reduce the complexity of causal relationship and clarity to the study, the threshold value is raised to α=0.73, at this value the relationships come out clear and viable. Thus, the tij values considered are α≥0.73, which are highlighted in Table 8.

Table 8: Calculating threshold value (α) and to selecting tij for causal relationship.

	f1	f2	f3	f4	f5	f6	f7	f8	f9	f10	f11	f12
f1	0.454	0.653	0.673	0.706	0.753	0.727	0.728	0.756	0.643	0.621		0.645
f2	0.556	0.615	0.708	0.733	0.776	0.766	0.777	0.785	0.689	0.726	0.760	0.676
f3	0.580	0.726	0.626	0.766	0.806	0.779	0.795	0.815	0.695	0.660	0.789	0.692
f4	0.533	0.661	0.665	0.625	0.757	0.746	0.741	0.771	0.652	0.666	0.747	0.665
f5	0.511	0.657	0.642	0.704	0.657	0.721	0.716	0.760	0.648	0.645	0.736	0.646
f6	0.506	0.665	0.648	0.696	0.754	0.650	0.734	0.758	0.656	0.616	0.745	0.664
f7	0.550	0.702	0.691	0.741	0.802	0.791	0.686	0.811	0.719	0.645	0.781	0.701
f8	0.495	0.650	0.644	0.676	0.737	0.712	0.718	0.657	0.641	0.654	0.733	0.638
f9	0.478	0.652	0.650	0.677	0.740	0.736	0.725	0.749	0.575	0.609	0.742	0.662
										0.627		
f10	0.416	0.549	0.527	0.574	0.620	0.613	0.592	0.633	0.551	0.466	0.634	0.571
f11	0.345	0.457	0.442	0.473	0.516	0.500	0.481	0.528	0.444	0.440	0.451	0.462
f12	0.365	0.489	0.488	0.512	0.569	0.553	0.537	0.576	0.513	0.502	0.584	0.442

Step 6: Constructing causal relationship diagram. The values of tij which are greater than or equal to 0.73 and highlighted in the table, are considered for developing causal interaction between perspectives e.g. t15 value is 0.75284 which is greater than the threshold value 0.73, thus t15 value is included for causal relation wherein, arrow in the cause and effect diagram was drawn from f1 to f5 (refer Figure 3)

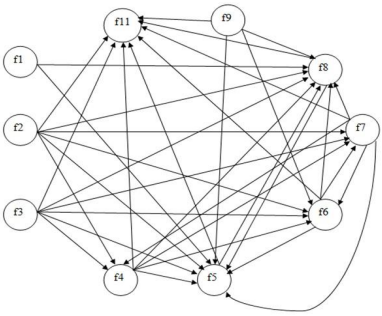

Figure 3: The causal diagram of total relation (α ≥ 0.73)

5 Discussion

From Table 7, it is evident that providers/developers of wearable technologies consider consumer convenience in using the WTs (*f7*) is the most powerful item in the entire consumer readiness scale with an impact value of 16.859 and it plays a major role because the values of both Ri+Cij and Rij-Cij are significant. On the contrary, the feeling of independence *(f12)* is the least important item focused by providers while developing WTs, with impact value 13.59494. From table 7, it is evident that items understandable instructions (*f1*)", "expected of consumer (*f2*)" and "clear processing (*f3*)", "capability to use WTs (*f4*)", "convenience in using the WTs (*f7*) and "access anytime (*f9*)" are the items causing the effect on "confidence to use (*f5*)", "Within the scope of consumer ability(*f6*)", "able to use (*f8*)", "feel of accomplishment (*f10*)", "feel of enjoyment (*f11*)" and "feel of independence(*f12*)". This shows that providers majorly focus on enhancing the clarity on the consumer's role to know and to produce services, accessing WTs. The providers also focus on the extrinsic motivation that consumers can get out of using WTs and very less on ability aspect a need for a consumer to interact with WTs. Based on the cause and effect diagram (refer figure 2), it is evident that "understandable instructions(*f1*)", "expected of consumer(*f2*)", "clear processing(*f3*)" and "access anytime (*f9*)" are the most prominent factors that cause all other factors in the entire consumer readiness system, though "capability to use WTs (*f4*)", "convenience in using the WTs (*f7*)", "Access WTs anytime (*f9*)" cause other factors but they are moderately significant (refer figure 2). This explains that there exists a gap in the preference of consumer and the providers in wearable

devices in terms of consideration for readiness for accessing WTs which is supported by Yang et al. (2016) in his study, that perceived value is the major driver for intention to use wearable devices and this value is derived based on the perceived benefits like social image, enjoyment and usefulness. According to figure 2, "Feel of enjoyment" (*f11*) is the item that is affected by all other items in the system and this observation is also supported by Kim et al (2013) in his study, which perceived that enjoyment is also a factor that drives user intention in tour information services. Based on the phase 1 and phase 2 of this study it is evident that "ability to operate" is not to be improved by the developers to increase the effectiveness of WTs usage. This explains that, there exists a gap in consumer preferences and provider preferences while using and developing the wearable technologies respectively. From table 2, it is evident that consumers prefer "Clear Process of Using Wearable Technologies" (*f3*) to less preferred whereas the providers consider to a prominent cause in the consumer readiness items, this gap is also supported by Mishra et al. (2018), in their study stated that people from developing countries show low level of technology awareness and are less familiar with technical terms used in the technology. This confirms that the effort put in by providers is not effectively communicated among the consumers. From figure 2, "Capability to use" (*f4*) is not that a prominent focus from the providers' perspective though based on the study by Khaksar et al. (2017), it is found that dynamic capabilities are crucial for developing service innovations among care providing organizations. Thus, this study addresses the major setbacks that occur between the WTs providers and the consumer who purchases to use it, and addressing these setbacks will enhance the usage of wearable technologies. This study as well enables researchers to further work on the gaps and understand the mismatch occurring between the providers and users.

6 Implications and Future Scope

For practitioners, this study will help to priorities their focus of developing wearable technologies, so that maximum usage and adoption of fitness devices are achieved. The factors established in this study can be used for focusing on future technologies development and to formalize a strategy to capture the market space sooner and effectively. This study can be adopted by the managers to check for their perspective with the market demand. Service providers can adopt this study to evaluate their current service gaps and address those gaps ensure sustainable use of wearable fitness technologies. For Policy makers, this study will be a base work to understand and promote consumerism by addressing the gaps notified in the discussions and enable consumers to gain more benefit out of the technologies available in the market. Enables officials to point out the mismatch in the commercialization of WTs, so that

every consumer is included in the participation of technological use and bring sustainable adoption of products developed. For academicians, the framework of this study can be followed in future for understanding the service gaps existing in other wearable technologies. The influence of individual differences like age, gender, socio-economic status can be studied and elaborate the service gaps further. Researchers can consider each service gap and find the impact these gaps have on the adoption of wearable technologies. This study can be adapted to other new technologies like Internet of things (IoT), chatting AI enablers (Chatbots) and voice AI enablers (Voicebots). Other concepts of readiness like technology readiness, social readiness, motivation readiness, learning readiness and policy readiness can be studied on wearable technologies, adapting the same methodology. Overall, this study aimed at identifying the key factors of consumer readiness and the estimation of importance of these factors by consumers and providers using a proper decision dynamic tool with rigor and relevant suggestions.

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Annexure

Annexure 1: Questionnaire for CR Instrument.

1. Please read the below mentioned codes and enter your response to the respective questions/statements in the space provided.

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat agree	Agree	Strongly Agree

Statements	**Codes**
RC1: Usually there are understandable information available, regarding WTs	
RC2: I know what is expected of me if I use wearable technologies	
RC3: The steps in the process of using WTs are clear to me.	
AB1: I believe I am fully capable of using WTs	
AB2: I am confident in my ability to use WTs.	
AB3: Using WTs is well within the scope of my abilities.	
EM1: With my lifestyle, a device that could analyse my physical fitness is desirable.	
EM2: With my lifestyle, a device that could easily store and analyse my everyday activity is desirable.,	
EM3: With my lifestyle, a device that could be portable and innovative is desirable.	
IM1: When I think of using WTs for my physical fitness, a personal feeling of worthwhile accomplishment is desirable.	
IM2: When I think of using WTs, a personal feeling of enjoyment (e.g., cool and fun) is desirable.	
IM3: When I think of using WTs, a feeling of independence is desirable.	

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