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Consumption Goals of Attributes Associated with a Product: A Study of Smart Running Shoes for a Group of Consumers in Nottingham, UK

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Abstract

Wearable products with high tech content for any sport activity or exercise could perform to fulfil unmet needs or goals. The research investigated consumption goals and product evaluation with the Goal-Based Model for a study of smart running shoes. Online research was carried out to obtain the attributes of smart running shoes. Face-to-face interviews with voluntary participants were performed to explore desired goals corresponding to each attribute of the product. New participants filled in a survey questionnaire in order to measure their own subjective evaluation of the product as per their own goals. All participants were staying in Nottingham, UK during the survey. Eight different consumption goals were obtained in accordance with the attributes of smart running shoes. Product evaluation was calculated using the probability and importance of goals expected from the consumption of the product.

Key words: *consumption goals, running shoes, goal-based model, attribute, evaluation.*

Introduction

With advances in technology, especially electronics, the integration of minimised sensors, electronic circuits and power supplies with textile products has been facilitated. The interaction of electronic devices with textiles means new products developed for users [1]. The combination of textiles and electronics has led to the development of wearable textile systems. Today, terms such as "smart textile" and "wearable computer" are widely used in everyday contexts. These terms refer to textiles that can detect and respond to stimuli from the environment and adapt to them [2]. The wearable tech industry has attempted to bring solutions to many needs that have not been met effectively so far. In recent years, all sorts of innovative, high-tech products facilitating people's lives have been developed by a large number of firms. Wearable technology is commonly separated into four main categories: (1) sport and wellness, (2) information and entertainment, (3) healthcare and medical, and (4) industrial and military. The owner of the highest market share globally (61%) belongs to wearable technology products located in the area of sport and wellness [3]. This industry has a profitable future by creating opportunities for market growth.

To emphasize "why" and "how" products are important in individuals' life, it's necessary to understand the consequences of product attributes, named product goals or consumption goals – i.e. what goals people may pursue in a particular product during sport or exercise? Also, the question we look for answer here is how they evaluate this product in accordance with the desired goals?

Goal-Based Model is considered to explore product evaluation and choice to the prospective users. The model as it stands is much better suited than the multi-attributes model to predict the intent of performing behaviour (i.e. purchasing) or consuming the products. Van Osselaer and Janiszewski (2012) stated that a goal-based model assumes the product evaluations and choices are motivated by consumers' expectations about the benefits of consuming a product [4]. As different from the approach of multi-attributes model, the model proposes that "consumers value products for the benefits they afford, not the attributes they contain (e.g. consumers value the alertness afforded by the caffeine in coffee, not the caffeine per se)". According to the model, the evaluation of a product (vi) is a multiplicative function of the probability (pij) and importance of goal (gi) expected from the consumption of the product.

Literature review

What people want to have when they make purchases varies according to different demands and needs. In order to understand the reasons why a certain product is considered for purchase, prior studies have focused on product attributes before goal-based reasons. From the

perespective of the multi-attribute utility model, consumer choice and product evaluation are determined by the utility of attributes the product contains [4-6]. Later, research investigating the motivation of people to consume or choose a product showed the importance of goals achieved by going beyond product attributes [7]. Another researcher Chernev (2004) considered product evaluation as a function of the compatibility of consumers' goals with the attributes describing choice alternatives [8]. As such, consumers could be liable to buy when their goals are compatible with the product attributes.

"Consumer goals are generally defined as intentions to achieve desired ends by means of consumption of goods or services" [9]. Consumption goals refer to the benefits products afford, not the attributes they contain. According to the goal-based view, the benefits do not have the stable importance-weights in consumer choice. And the value of a product vaires by the weighted importance of the benefits [10], which may depend on the brand or be independent of it. Individuals prioritise in order to meet their needs, and if it is to buy a product of a particular brand, then it is called a product-specific goal. On the other hand, it is called a generic goal if they desire to buy any product as a way to fulfil their needs [11]. Therefore, it is necessary to be able

to distinguish between the benefits of a product and the brand.

Expectation-value theory, founded by M. Fishbein in 1970s, holds that people are goal-oriented beings. Their behaviour in response to their expectation (belief) and evaluation is performed to reach an end or goal. According to the approach, behaviour, behaviour intentions, or attitudes are seen as functions of "(1) expectancy – the perceived probability that an object possesses a particular attribute or that a behaviour will have a particular consequence; and (2) evaluation – the degree of effect, positive or negative, toward an attribute or behavioural outcome" [12-14].

Consumers are more interested in what product attributes will work for them (called goals) than in the attributes themselves. Thus, for high tech products, in how they facilitate people's lives, it is important to position them by going beyond their attributes. The emerging trend of more physical activities reminds us of the fact that people probably seek out and pursue higher expectations in their lives. The increasing interest in sports activities could be due to some requirements such as socialising, recreation, aesthetics, health, and so forth. According to the results of this study, smart running shoes in relation to goals consumers intend to

reach are summarised in the following way: exercise healthy and effectively without loss of time, workout data security and accessibility, and socialising. In addition, product evaluation of smart running shoes was found to be extremely high, as reported by consumers based on the Expectation-value model.

■ Methodology

Sport and exercise are the mostly preferred leisure markets in the UK [15]. Smart running shoes were investigated for use during many sports or exercise. The product is introduced to the market as providing computerised shoe adjustments according to the wearer's movements. A software application continuously monitors the shoe's health and alerts you when problems occur. It actively monitors power usage, air comfort system performance, and motion analysis [16].

First, the product attributes of smart running shoes introduced to the participants were as a result of online research. 7 different attributes describing this product were used, including normal and smartness functions. Second, the laddering method, known as the research interview technique, was used to uncover the underlying goals of purchase or use of the product. Accordingly, through face-to-face interviewing conducted to explore

Table 1. Sample profile.

Sex	Age		Marital status		Place of birth	Native language
69.4% female (50)	18 (2)	19 (13)	Never married (62)	Married/ Partnered (5)	UK (47)	English (17)
27.8% male (20)	20 (17)	21-22 (9)	Separated/ Divorced (1)	Widowed (1)	Other (21)	Other (0)
2.8% NA (2)	23-24 (5)	25-36 (9) / NA (17)	NA (3)		NA (4)	NA (38)
Home Location	**Transport type used***		**Exercise participation**		**Reason for purchasing sport footwear etc.****	**Purchased sport items*****
Metropolitan (city/suburbs) (52)	Car (driver) (26)	Car (passenger) (13)	Every day (5)	5-6 days a week (9)	For sports use (51)	Any purchase of sport goods (16)
Regional/rural community (10)	Taxi (12)	Public transport (34)	2-4 days a week (30)	Once a week (9)	For non-sports use (18)	Clothing & footwear (56)
NA (10)	Other (Walk) (2)	NA (10)	2-3 times a month (6)	Once a month or less (10)	Don't know/can't remember (6)	Equipment & accessories (18)
			Never (1)	NA (2)	NA (4)	None of these (6) / NA (3)

NA not available
* *Transport type used: Same person can use more than one transport type (multiple choice question).*
** *Reason for purchasing sport footwear etc.: Why have you bought sports clothing, footwear, equipment or accessories in the past 12 months for either yourself or someone else? (multiple choice question – 7 persons selected both the first and second options).*
*** *Purchased sport items: For your exercise have you bought the following in the past 12 months? (multiple choice question).*

Table 2. *Product attributes, consumption goals and evaluation of smart running shoes.* **Note:** ** the smartness function of running shoes*

Product attributes	Consumption goals	Goal evaluation (Probability* Importance) = x $1 \leq x \leq 25$
A1. Smart running shoes record your movement and also your body posture when you are taking part in any sport or exercise.	G1. The product can help to protect from loss of sport or exercise data by saving it online.	11.71
	G2. It is easier to access data online.	12.44
A2. You can access or transfer data backup to your phone through apps, or wirelessly connect to your PC.	G3. You can track your progress over time, which will improve your performance.	13.43
A4*. The trainers you get in the market are not automatically adjustable. Smart running shoes can be adjusted according to the sport or exercise you are involved in.	G5. You can maintain your workout or exercise in a health way.	11.61
A5. You can share exercise data with others through wireless communication between your shoes automatically.	G6. This is an alternative way to share information with other people.	11.54
A6. During this process, you do not have to stop exercising or the workout in order to write anything down.	G7. It helps to save time for exercise or workout efficiently.	8.68
A7. When you get problems with your smart running shoes, customer support can connect with your shoes and fix them.	G8. The reason for the problem can be explained effectively just in time when the problem occurs.	10.49
Product Evaluation Score		10.91

the consequences or goals associated with the product attributes, three basic questions were asked to respondents: (1) Why is this product attribute important to you?; (2) What does it mean to you?; and (3) What is the meaning of this product having this attribute [17]? 4 voluntary comments of participants were recorded during the interview, and then examined in depth in order to define consumption goals according to each product attribute with the help of two other scholars. Accordingly, a list of goals intended to be achieved by smart running shoes was summarised.

Next, the expectancy value model was used to explore how consumers evaluate product goals, referring to the multiplicative function of the importance and probability of goals occuring [4]. 72 new participants filled in the survey questionnaire in order to measure their own subjective evaluation of the products as per their own goals. The questionnaire included the consumption goals' importance and the probability of such a goal occurring for individuals. For the first measure, as suggested by Lantos (2015), arguments representative of foregone consumption goals were used to rate the goals on a scale of 1 to 5 (in which 1 = *not at all important* and 5 = *very important*) according to the importance they attached to each attribute given when purchasing smart running shoes [18]. Secondly, respondents were asked to rate how the smart running shoes would perform based on each argument by using the scale of 1 to 5 (in which 1 = *very poor performance* and 5 = *very good performance*). The expected value of each consumption goal was calculated by multiplying its importance by its probability (or performance). All

multiplication results were aggregated by dividing the number of respondents for each consumption goal, and goal evaluation scores (x) were obtained ($1 \leq x \leq 25$, from X = 7.43 to X = 13.43). The multiplication results were summed across the 8 goals and divided by the number of consumption goals to calculate the product evaluation, as can be seen in **Table 2** (X = 10.91).

The evaluation of a product (vi) is defined as below [4].

i: refers to a product that is predicted to help or hinder the attainment of a goal.

j: refers to the goal (i.e. benefit) expected to be achieved or avoided in consuming the product.

g: refers to the perceived importance of the goal attached to each attribute given when purchasing the product.

p: refers to the probability (or performance) of the product meeting the specified goal associated with the attributes given.

$$V_i = \sum_j (g_j \times p_{ij}).$$

All participants were staying in Nottingham, UK during the survey. The sample was composed of 72 individuals (69%female, 28% male, and 2 unresponsive). They ranged in age from 18 to 36 years. The sample profile is detailed in **Table 1**.

■ Results

7 product attributes, 8 consumption goals associated with the attributes and product evaluation according to the goals for smart running shoes are shown in **Table 2**. Attributes are coded from A1 to A7,

among which only A4 refers to the smartness function of the product. For attribute A1, two goal items are described, whereas others have only one. Then a total of 8 product goals are obtained and codded from G1 to G8. Goal evaluation equals the multiplication of goal probability by goal importance. According to the respondents, the evaluation score obtained is, in order from largest to smallest, 13.43 for G3, 12.44 for G2, 11.71 for G1, 11.61 for G5, 11.54 for G6, 10.49 for G8, 8.68 for G7, and 7.43 for G4. The goal related to the smartness function is in 4th place in this order (A4; G5).

■ Discussion

The study aimed to explore the underlying reasons for the consumption of a product for its usage during sports activities or exercise. For this purpose, smart running shoes were examined because they are very likely to be worn in many sports or exercise, such as walking, running, tracking, fitness training, basketball, and so forth. Described by standard attributes as well as the smartness function, running shoes were studied to disclose the consumption goals that people can feel motivated to achieve and their product evaluation.

8 separate consumption goals were determined in accordance with the attributes of smart running shoes. As seen in the following table, consumption goals of more than one can be attached to the same attribute. Five standard attributes are described when one special attribute is related to the smartness function of the product. In turn, product attributes are about exercise data recording (A1), the ways of accessing and transferring the

data (A2), an alternative way of communication with other people (A3), the smartness function (A4), an alternative information sharing platform (A5), the ablility to do non-stop sport or exercise (A6), and remote customer service support (A7). The smartness function refers to the product's ability to be adjust itself according to the user's movements. When the 1st attribute is considered, data accessibility and protection are goals desired to be achieved from the use or consumption of smart running shoes (G1, G2). For the 2nd attribute, the goal is that product users can attain exercise data whenever they want (i.e. for tracking their performance) (G3). According to the 3rd attribute, the intended goal shows that users can view the product as a socialisation tool to help them be a member of a social group (G4). A product with a smartness function (the 4th attribute) can carry out the users' goal of doing sport or exercise in a healthier way, different from standard running shoes (G5). As for the 5th attribute, the consumption goal is to provide people with another way of sharing necessary information. The goal attached to the 6th attribute is that while users are not only doing exercise or sport but also communicating with other people (i.e. friends, coach), the product enables them to use their time effectively. Finally, the 7th attribute is related to the consumption goal of desiring to do non-stop exercise or sport without wasting time solving a problem occurring in the product. Smart running shoes in relation to goals consumers intend to reach are summarised in the following way: exercise healthily and effectively without loss of time, workout data security and accessibility, and socialising. Consumption goals compatible with the smartness function of running shoes tend to be overweighted overvalued in the product evaluation (G5). Generally, each consumption goal has nearly the same weight in consumer evaluation, except for two (G4, G7).

■ Conclusions

The emerging trend of more physical activities reminds us of a fact that people probably seek out and pursue higher expectations in their lives (various goals, needs, desire etc.). The increasing interest in sports activities could be due to some requirements, such as socialising, recreation, aesthetics, health, and so forth. As such, wearable smart products in any sports activity or exercise could

perform to fulfil consumers' unmet needs or goals. For high tech products to facilitate people's lives it is important to position them by going beyond their attributes. These products are gaining more meaning not only for prospective users but also scholars and product managers in terms of their ability to meet consumption goals desired by consumers. Innovative high-tech products such as smart running shoes deserve much more attention to comprehend the goals of consuming a product as per attributes.

This research was carried out with some limitations. First, the sample consisted of 72 people, and to increase the representative power of Nottingham's population, it is recommended to reach the elderly and children as well. Second, according to Serweta et al. (2019), as in sports, the characteristics and purposes of use expected by different shoe users in military and protective areas can be investigated. Next, if different product groups have been researched, there may not be products with the same features, and the same purchasing targets may not be pursued at the same time. Consumers can evaluate products with different characteristics in line with different consumption purposes. Hence, product-specific and consumption goals that are common, in other words, shared between different product groups, may be the subject of future studies.

There may be other usage-related features that have not been addressed in this study, but which may have a decisive effect on consumers' product preferences. For instance, consumers can accept wearable textiles if they do not require any special care other than regular washing operations, preferably without removing all the electronics on them [2]. In addition, better hygiene characteristics can be expected in a shoe, such as the ability to reduce the likelihood of pathogenic microbes, fungi, and resulting odours [19]. Consumption goals associated with other high-importance product characteristics, such as easy washing and no smell, are also recommended to be examined in future studies.

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