KNOWLEDGE INFLUENCE ON PURCHASE INTENTION TOWARDS REMANUFACTURED MOBILE PHONES

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ABSTRACT

Consumers' knowledge exerts a great impact on their willingness to make purchase decisions. The present research studied the impact of knowledge on perceived risk, perceived value, and intentions to purchase refurbished mobile phones. Data were collected from randomly selected mobile phone users aged 18 to 50 years old and above. A closed-ended questionnaire was used to collect the data. SPSS and AMOS were utilized for data analysis. The findings indicate a positive influence of previous experience, subjective knowledge, and perceived value on purchase intention. Perceived risk has a negative effect on purchase intentions. Quality knowledge and price knowledge have negative impacts on perceived risk and positive impacts on perceived value. Perceived value is positively influenced by three dimensions of objective knowledge. The theory-based model of this research can be used in future studies on consumer behavior in remanufacturing or closed-loop supply chains. This research provides new findings regarding the influence of knowledge on purchase intention towards remanufactured products.

Keywords: Learning Theory; Objective knowledge; Perceived risk; Perceived value; Previous experience; Prospect theory; Purchase Intention; Remanufacturing; Subjective knowledge

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Introduction

Production consumes energy and various resources, and non-circular production practices lead to resource depletion and environmental damage. Resource depletion occurs due to the excessive

use of natural resources, while environmental damage arises from waste production and resource degradation. The situation worsens as products are extensively used and disposed of. However, products can be remanufactured or refurbished for reuse, offering a cost-effective solution that requires fewer efforts and reduces energy and resource consumption. Remanufacturing lowers prices and attracts customers while saving energy, preserving natural resources, and reducing greenhouse gas emissions. Remanufacturing has several benefits, including extending the product's life, making used products usable, and enhancing their value for users. These environment-specific advantages also attract people to buy refurbished products. However, customers play a vital role in realizing the benefits of remanufacturing by not discarding used products and instead purchasing refurbished ones. Consumer acceptance is crucial for sustainable consumption, and it is influenced by customers' perceptions. When customers are aware of the values and risks associated with remanufactured products, they are more likely to express an intention to purchase them.

Remanufactured products are a significant component of the circular economy and have been the subject of research by scholars. Despite the positive impacts of the circular economy, customers often perceive the quality of refurbished goods as low. Other attributes associated with refurbished items also discourage customers from purchasing them. Understanding customers' intentions to purchase remanufactured products becomes important as the coexistence of new and refurbished products becomes more prevalent. Electrical and electronic equipment (EEE) present a diverse and unpredictable waste stream, making the remanufacturing issue in this sector particularly noteworthy.

Uncertainty and unpredictability of EEE waste are compounded by the extensive use of these short-lived products. Electrical and electronic equipment (EEE) have a shorter usage life, especially high-technology products like smartphones, which has a significant impact on the environment (Rau et al., 2019; Zhou & Gupta, 2020). Remanufactured mobile phones, being consumer electronics, are the focus of this study, aligning with the call for research in the remanufacturing market (Hazen et al., 2017).

The study specifically focuses on smartphones due to their rapid advancement and widespread use. The environment suffers adverse consequences when a large quantity of smartphones is discarded within a short time frame. The researchers found that most users keep their smartphones for 2 to 3 years before replacing them for better performance and upgraded features. The increasing use of smartphones for study purposes has also driven up the demand for these devices. Mobile phone users strive to keep up with new apps, resulting in software upgrades and new phone purchases. According to Statista Research

Department (2021), an average of 16,000 new apps are released each month. Moreover, Gu (2021) reports that the number of mobile phone users reached 3.6 billion in 2020 and is expected to reach 4.5 billion in 2024.

The extensive use and short lifespan of mobile/smartphones have captured the attention of researchers. Understanding the determinants of purchase intention for mobile phones is valuable in terms of remanufacturing and addressing the perceptions of a wide range of mobile phone users. This study aims to provide an analytical framework for mobile phone owners and remanufacturers to enhance the quality of the remanufacturing process. The research question guiding this study is, "What are the variables perceived by consumers that lead to purchase intention for remanufactured mobile phones?" The study investigates the influence of perceived risk and perceived value on purchase intention, as well as how consumers' knowledge affects their perceptions of risk and value. Furthermore, the impact of consumers' previous actual experience on their intention to purchase refurbished mobile phones is examined.

The remaining sections of the paper are divided as follows: Section 2 covers the literature review and presents the research model, highlighting the determinants of intention to purchase remanufactured smartphones. Section 3 provides an overview of the methodology, including information on the sample, measures, data collection, and analysis. Section 4 presents the results, while the last section consists of a general discussion and implications derived from the findings.

Literature Review

Theoretical Background, Hypotheses and Model Development

This research is grounded in prospect theory, which proposes that the consumer decision-making process consists of two stages: the "editing" stage and the "evaluation" stage (Puto, 1987). In the editing stage, decision-makers simplify the problem by initially analyzing the given prospects. The evaluation stage involves assigning values to all prospects and selecting the outcome with the highest value. Prospect theory helps facilitate consumer decision-making. A rational decision-maker tends to choose an outcome with uncertainty rather than one that is merely probable (Tarnanidis et al., 2015), and the framing of the problem can reverse a choice (Puto, 1987). The present study suggests that additional knowledge about prospects of remanufactured mobile phones can reframe participants' prospects and influence their decision-making process. Prospect theory is valuable in this research as it helps understand consumers' selection of outcomes involving risks. Consumers face post-purchase undesirable outcomes and uncertainties (Taylor, 1974), and they are less likely to purchase when the perceived risk is higher (Roselius,

1971). Doubts about the quality of remanufactured products reduce consumers' willingness to pay (Hazen et al., 2012).

Prospect theory is relevant to decision-making under uncertainty, establishing a relationship between decision-makers' risk propensity and gains and losses. According to McDermott (2001), individuals tend to be risk-averse in a domain of gains but more risk-tolerant (or even risk-seeking) in a domain of losses (Wang & Hazen, 2015). This study considers perceived risk and value as predictors of purchase intention. Perceived value strongly influences consumer satisfaction and purchase intention, as consumers tend to choose options with higher perceived value (Dodds & Monroe, 1985; Zeithaml, 1988). It is argued that the benefits (quality, price, environment) of remanufactured mobile phones enhance their perceived value and, ultimately, consumers' purchase intention.

Consumers' knowledge about a product is a decisive predictor that influences their attitudes (Park et al., 1994). Knowledge can be categorized as past experience, subjective knowledge, and objective knowledge (Park & Lessig, 1981; Alba & Hutchinson, 1987; Xiao et al., 2014). Objective knowledge refers to consumers' real or actual knowledge, while subjective knowledge pertains to their beliefs about the product (Park et al., 1994). This study considers quality knowledge, price knowledge, and environmental knowledge as dimensions of objective knowledge. These variables influence perceived risk and perceived value. Past experience and subjective knowledge are directly related to purchase intention. These relationships are depicted in Figure 1 (hypothesized model).

Hypotheses and Model Development

Previous Experience

Consumers' decisions are influenced by their previous experiences as these experiences have an impact on their decision-making process. When consumers derive satisfaction or pleasure from using a product, it encourages them to make future purchases. In the present research, respondents who had satisfactory experiences with refurbished mobile phones indicated their intention to purchase such phones in the future, which aligns with findings in brand loyalty research (Aaker, 1996).

Numerous studies have shown that past experience has a significant impact on consumers' intentions. Past experience influences consumer intentions (Han et al., 2011; Wang et al., 2011; Lian, 2017). Balau (2018) also highlights that past experience is a predictor of intention and behavior. These relationships can be explained by the "Consumer Learning Theory."

Consumer learning refers to "the process by which individuals acquire the purchase and consumption knowledge and experience they apply to future related behavior" (Schiffman et al., 2008, p. 185). The authors propose two learning approaches: the behavioral approach, in which people learn from events or occurrences in their environment, and the cognitive approach, in which they learn from their previous experiences.

In this research, it is posited that consumers learn from their previous experiences of using remanufactured mobile phones, and these experiences influence their intentions to purchase such phones in the future. Based on the above discussion, the following hypothesis is established:

H1: Previous experience regarding remanufactured mobile phones positively influences intention to purchase remanufactured mobile phones.

Subjective Knowledge

Consumers who possess product knowledge have a better understanding of the benefits associated with the product, which influences their purchasing decisions. They actively search for information based on their existing knowledge and use it to make confident purchases (Punj & Staelin, 1983; Moorman et al., 2004). Consumers with product knowledge demonstrate a higher level of involvement in seeking information specific to their product category (Park & Lessig, 1981; Brucks, 1985).

Product knowledge is a strong predictor of customer behavior (Brucks, 1985; Park et al., 1994; Oh & Abraham, 2016). Subjective knowledge, which refers to personal opinions, traits, viewpoints, and beliefs, is one aspect of product knowledge (Veale, 2008). It significantly influences customer behavior (Park et al., 1994; Carlson et al., 2008; Vigar-Ellis et al., 2015). Building upon these studies, the present research establishes the following hypothesis:

H2: Subjective knowledge regarding remanufactured mobile phones positively influences intention to purchase remanufactured mobile phones.

Objective Knowledge

Numerous studies have emphasized the relationship between knowledge and decision-making processes (Alba & Hutchinson, 2000; Hadar et al., 2013; Lee, 2016; Lee & Koo, 2012). Understanding plays a significant role in product adoption, and it is heavily influenced by knowledge (Moreu et al., 2001). Consumer knowledge refers to the information stored within an individual's memory (Engel, Blackwell, & Miniard, 1990). Objective knowledge, as defined by Veale and Quester (2007), refers to current and accurate information stored in individuals' long-term memory.

In the context of this research, it is suggested that consumers utilize their objective knowledge of remanufactured mobile phones to assess the perceived risk and value associated with such products. This study examines the relationship between objective knowledge (specifically, quality knowledge, price knowledge, and environment knowledge) and the perceptions of risk and value, as these dimensions have been prominent in previous research within this field (Michaud & Llerena, 2011; Hazen et al., 2012).

Quality Knowledge

The quality of remanufactured goods can elicit ambiguous feelings among consumers (Hazen et al., 2011, 2012). Ambiguity arises when consumers lack information and are unable to fully understand the situation or predict future outcomes (McLain, 2009). According to ambiguity aversion theory, individuals generally prefer known risks over ambiguous risks when making decisions (Ellsberg, 1961). In the context of remanufactured mobile phones, consumers may prefer known risks because they are aware of the potential impact of those risks, whereas the level of risk associated with ambiguous situations is uncertain.

Remanufacturing processes for mobile phones can be perceived as ambiguous by consumers because they lack knowledge about the age of the mobile phone, the specific remanufacturing procedures employed, and the replacement or repair of parts and components, among other factors.

The present research argues that consumers' objective knowledge of remanufactured mobile phones can alleviate perceptions of risk and ambiguity. When consumers possess knowledge about the remanufacturing process, they can better understand the quality of remanufactured products (Hauser & Lund, 2003). Consequently, it is proposed that a higher level of quality

knowledge among consumers increases the perceived value of remanufactured mobile phones and reduces the perceived level of risk associated with them.

H3: Level of quality knowledge is negatively related with perceived risk about remanufactured mobile phones.

H4: Level of quality knowledge is positively related with perceived value about remanufactured mobile phones.

Price Knowledge

Prospect theory suggests that decision-maker reverse the choice by changing framing of problem to manipulate the reference point (Puto, 1987). Previous research points out that initial purchase price and subsequent costs define financial risk (Grewal et al., 1994). It is probable that higher price paying consumers are more prone to financial risk than consumers who pay lower price. It can be suggested that knowledge level of price changes the perceptions of consumers. It leads to following hypothesis:

H5: Knowledge level of price of remanufactured mobile phones is negatively related with their perceived risk.

During the market survey, the researcher of this study found that prices of remanufactured mobile phones are 15% to 35% less than new mobile phones. According to Wang et al. (2013), such products are priced 30-40% less than fresh or new products. Comparatively, remanufacturing the same product requires 80% of the work efforts and 40-60% of the costs as compared to producing a new product (Dowlatshahi, 2000). These price differences significantly influence value and risk perceptions. It is suggested that knowledge of low price results in a higher perceived value of remanufactured mobile phones.

Perceived value is highly influenced by price (Zeithaml, 1988; Chang & Wildt, 1994). Wang and Hazen (2016) stated that the advantage of a low price enhances value perceptions and reduces risk perceptions. Price is also a significant determinant of customers' loyalty (Tahir, 2022). Therefore, price becomes a major reason for buying remanufactured products (Michaud & Llerena, 2011; Wang et al., 2013; Xu et al., 2017; McKie et al., 2018; Vafadarnikjoo et al., 2018).

Prospect theory states that people evaluate losses or gains by comparing them against a reference point. According to Kahneman and Tversky (1979, p. 273), "the carriers of value or utility are changes of wealth, rather than final asset positions that include current wealth." Prospect theory involves an editing phase and an evaluation phase. During the first phase, the decision-maker sets a benchmark to evaluate gains/losses, assigns probabilities to outcomes, and distinguishes between risky and riskless prospects. In the evaluation stage, the decision-maker chooses the prospect with the highest value. In this way, consumers perceive remanufactured mobile phones with low prices as having great value. Based on the above discussion, the following hypothesis is suggested:

H6: Knowledge level of price of remanufactured mobile phones is positively related with their perceived value.

Environmental Knowledge

Topics such as environmental degradation, pollution, and greenhouse gases are receiving increasing attention. This is evident from contemporary media broadcasts, seminars, and conferences on such issues. Organizations are striving to augment their environment protection efforts through their corporate social responsibility (CSR) policies. Consumers can play a vital role in environmental sustainability. This study posits that environmental knowledge regarding remanufactured mobile phones enhances the perceived value of such devices. The use of remanufactured mobile phones reduces electronic waste, promotes green products, and preserves the environment. These factors increase the perceived value of remanufactured mobile phones.

Previous studies also highlight the role of companies in enhancing supply chain sustainability (Presley & Sarkis, 2007) and information dissemination to change behavior (Abrahamse et al., 2005; Kløckner, 2015). Such efforts are meant to induce people to participate in alleviating environmental problems (Abrahamse & Matthies, 2012). Environmental knowledge includes subjective (Ellen et al., 1991; Mohr et al., 1998) and objective (Abrahamse et al., 2005; Kaiser & Führer, 2003) knowledge of the environment.

Objective knowledge prevails as knowledge of environmental problems, awareness of alternatives, and knowledge of gains from particular behaviors (Frick et al., 2004; Kaiser & Führer, 2003). Studies show that environmental knowledge is a significant determinant of intention (Bamberg & Möser, 2007; Kaiser et al., 1999) and objective environmental knowledge

enhances pro-environmental behavior (Diaz et al., 2015; Geiger et al., 2014). This environmental knowledge regarding remanufactured products refers to consumers' understanding of savings in terms of energy and resources achieved through the recovery of such products (Michaud & Llerena, 2011). Remanufactured products have green value (Hazen et al., 2012a), and this enhances perceived value (Chen & Chang, 2012). Research highlights the influence of environmental benefits on purchase intention (Follows & Jobber, 2000). Hence, the following hypothesis is established:

H7: Environment knowledge regarding the remanufactured mobile phones is positively related to perceived value of remanufactured mobile phones.

Perceived Risk and Purchase Intention

This study posits the decisive impact of perceived risk on purchase intention. Purchase intentions are influenced by uncertainties regarding the quality of remanufactured products and the components that have been replaced. Generally, consumers do not know how and by whom products have been remanufactured, leading to a lack of information that stimulates dilemma and ambivalence among consumers. As a result, there is a high degree of perceived risk associated with remanufactured mobile phones.

Bauer introduced perceived risk for the first time in 1960, with its two dimensions being "uncertainty" and "adverse consequences". Perceived risk is an expectation of loss (Schierz et al., 2010) and refers to consumers' expectations regarding unfavorable and uncertain consequences of purchasing a product (Ko et al., 2004; Laroche et al., 2005). Consumers' risk perceptions significantly influence their evaluations and purchasing behavior (Ko et al., 2004).

Perceived risk has a negative influence on consumers' purchasing behavior due to the associated uncertainties of purchase outcomes (Peter & Ryan, 1976; Wang & Hazen, 2016). The scarcity and asymmetry of information contribute to perceived risk (Hamzaoui-Essoussi & Linton, 2014). Therefore, consumers have doubts and uncertainty regarding the performance, safety, and usefulness of the products (Sweeney et al., 1999). Consumers perceive risk as a sacrifice they perceive when evaluating the price paid and the possibility of loss (Ravald & Grönroos, 1996; Snoj et al., 2004). Prospect theory suggests that consumers show a negative attitude and low intention towards remanufactured products if they find them risky, and vice versa. Based on empirical findings and prospect theory, it is suggested that perceived risk has a negative impact

on purchase intention towards remanufactured mobile phones. Hence, the hypothesis is established:

H8: Perceived risk associated with remanufactured mobile phones has negative influence on purchase intention to buy such phones.

Perceived Value and Purchase Intention

Perceived value exerts influence on purchase intention (Chen & Chang 2012; Ponte et al., 2015). Perceived value is the outcome of evaluations and preferences from customers regarding the purchase and consumption of products. Woodruff (1997, p. 142) defined perceived value as "a customer's perceived preference for and evaluation of product attributes, attribute performance, and consequences arising from use that facilitates (or blocks) achieving the customer's goals and purposes in use situations." Wang and Hazen (2016, p. 14) defined it as "the consumer's overall assessment of the utility of a product (or service) based on perceptions of what is received and what is given."

Perceived value and the price paid or sacrifices made by consumers are interrelated. According to Lovelock (2000), it is a trade-off between sacrifice and benefits perceived by consumers. Previous studies indicate that perceived value is a significant determinant of satisfaction and intentions (Dodds et al., 1991; Wang & Hazen, 2016; Agostini et al., 2021). Prospect theory is relevant in studies on remanufactured products, as it suggests positive impacts of perceived value on purchase intentions (Wang & Hazen, 2016; Agostini et al., 2021). In connection with remanufactured mobile phones, if consumers perceive the value of such phones as high, they show a positive attitude and purchase intention towards remanufactured mobile phones (Chang & Wildt, 1994; Hamzaoui-Essoussi & Linton, 2014; Wang & Hazen, 2016).

H9: Perceived value positively influences purchase intentions towards remanufactured mobile phones.

Control variables

Purchasing behavior is linked to demographics as these factors have an impact on purchase intention. The present study includes the age, education, and gender of respondents as control variables to investigate if they have effects on purchase intention towards remanufactured mobile

phones. Previous studies have also included these demographic factors in consumer-related studies.

Age has been examined in studies on consumer behavior (Hawkins et al., 2007), and it has been found to influence buying intentions (Mo & Wong, 2012). This study posits that education plays a role in acquiring information regarding remanufactured mobile phones. Educated consumers tend to engage in prolonged information search (Beatty & Smith, 1987). Gender also contributes to the evaluation judgments of consumers due to the distinctive attributes associated with men and women (Meyers-Levy, 1989; Holbrook, 1986). Gender has been found to influence purchase intention (Akhter, 2003; Ahasanul et al., 2006).

Hypothesized Model

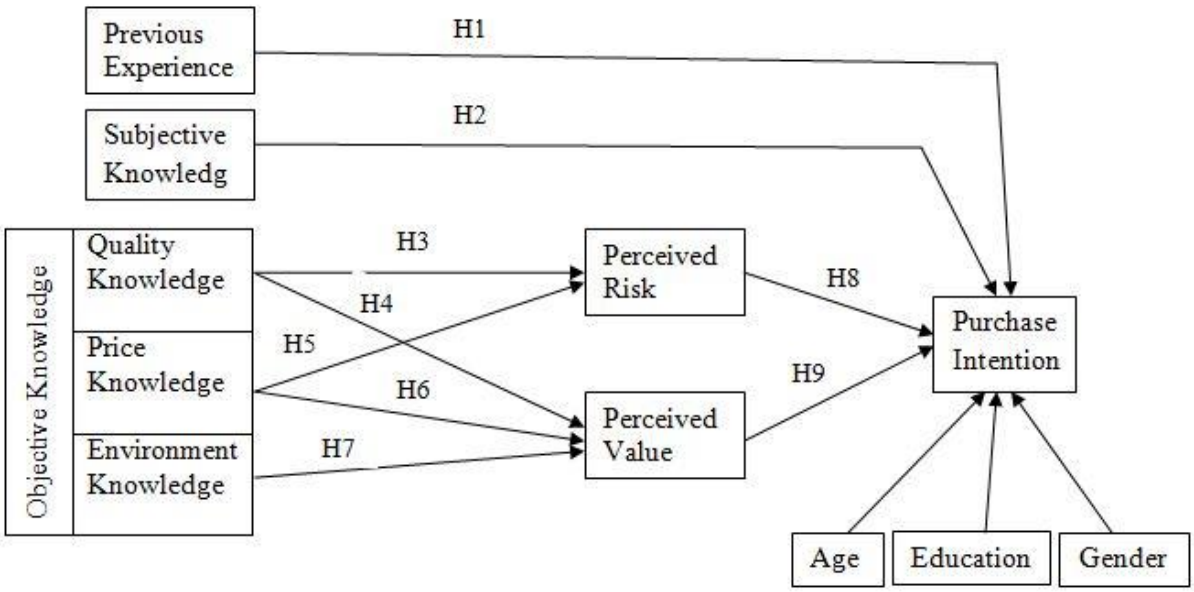

Fig. 1. Hypothesized Model

Methodology

Data Collection

Data were collected from mobile phone users, who served as the target population, using a questionnaire. The questionnaire consisted of eight sections with closed-ended questions. A five-point Likert scale (1= Strongly Disagree, 2= Disagree, 3= Neutral-Neither agree nor disagree, 4= Agree, and 5= Strongly Agree) was employed. Respondents were instructed to select only one option from each question. A total of 413 questionnaires were distributed among randomly

selected respondents. The response rate was 95%, resulting in 394 completed questionnaires collected. The first 50 returned questionnaires were utilized for a pilot study. The pilot study findings indicated satisfactory reliability values, ranging between 0.867 and 0.985. Based on these findings, the remaining questionnaires were distributed for data collection.

Research Instrument

This study used questionnaire to collect data. The questionnaire was prepared by using scales from previous studies that have been validated and used by other researchers in their work.

Data Analysis

The data analysis was conducted using SPSS software (Version 19) and AMOS software (Version 21). SPSS was utilized for initial data screening, demographic analysis, and reliability testing. On the other hand, AMOS was employed to assess the validity of the measurement model and test the hypotheses using structural equation modeling (SEM) technique. The choice of SEM was motivated by its advantages, including, "the estimation of multiple interrelated dependence relationships, and the ability to represent unobserved concepts in these relationships, while accounting for measurement error in the estimation process" (Terblanche & Boshoff, 2008, p. 107). This technique has also been employed in previous studies investigating consumer purchasing behavior towards remanufactured products (Wang & Hazen, 2016; Hazen et al., 2017; Agostini et al., 2021).

Results

Demographic Details

Demographic characteristics include age, education, and gender of respondents. Majority of the respondents 93 (23.6 %) fall under 26 – 33 years age group. Most of the respondents 114 (28.9 %) earned either master degrees or above whereas 112 (28.5%) held intermediate (12 years education). Respondents include 239 (60.7%) males and 155 (39.3%) females. These participants' descriptive statistics are presented in Table 1.

Table 1: Demographic Summary of Respondents

Items	Classification	Frequency	Percentage (%)
Age	18 - 25	69	17.5
	26 - 33	93	23.6
	34 - 41	84	21.3
	42 - 49	88	22.4
	50 and above	60	15.2
	Total	394	100
Education	Matriculation	67	17.0
	Intermediate	112	28.5
	Bachelors	101	25.6
	Masters and above	114	28.9
	Total	394	100
Gender	Female	155	39.3
	Male	239	60.7
	Total	394	100

Measurement Model

Reliability of the construct was measured with Cronbach's alpha and the values range from 0.864 to 0.930. Cronbach's alpha values are considered satisfactory if these are greater than 0.70 and values of Average Variance Extracted (AVE) greater than 0.50 are acceptable (Hair et al., 2010). AVE and factor loadings were calculated to estimate convergent validity of scale items with values above 0.50 criteria (Fornell & Larcker, 1981). Composite reliability (CR) values range between 0.794 and 0.923 and these are greater than the 0.70 criteria (Hair et al., 2012). These findings are shown in Table 2. The researcher of the present study tested discriminant validity by comparing AVE with inter-construct correlations. It is, "*the correlations between the items in any two constructs" (*Wang & Hazen, 2016 p.5). Square root of AVE was greater than all correlations between constructs indicate discriminant validity (Fornell & Larcker, 1981; Hair et al., 1998; Park et al., 2014). These findings are shown in Table 3.

Table 2: Convergent Validity and Reliability

Construct	Items	Factor Loadings	Average Variance Extracted (AVE)	Cronbach's Alpha	Composite Reliability (CR)
Past Experience	PE_1	0.838	0.627	0.878	0.857
	PE _2	0.819			
	PE _3	0.727			
	PE _4	0.875			
	PE _5	0.771			
Subjective Knowledge	SK_1	0.825	0.834	0.916	0.895
	SK _2	0.735			
	SK _3	0.794			
	SK _4	0.826			
	SK _5	0.833			
Quality Knowledge	QK_1	0.761	0.689	0.930	0.923
	QK _2	0.794			
	QK _3	0.782			
	QK _4	0.845			
	QK _5	0.842			
Price Knowledge	PK_1	0.763	0.727	0.917	0.901
	PK _2	0.831			
	PK _3	0.795			
	PK _4	0.771			
Environment Knowledge	EK_1	0.813	0.794	0.906	0.835
	EK _2	0.826			
	EK _3	0.784			
	EK _4	0.847			
	EK _5	0.801			
Perceived Risk	PR_1	0.853	0.825	0.842	0.814
	PR _2	0.822			
	PR _3	0.741			
	PR _4	0.781			
	PR _5	0.872			
	PR _6	0.932			
Perceived Value	PV_1	0.873	0.715	0.871	0.794
	PV _2	0.769			
	PV _3	0.872			
	PV _4	0.795			
	PV _5	0.774			
Purchase Intention	PI_1	0.831	0.821	0.864	0.813
	PI_2	0.798			
	PI_3	0.827			
	PI_4	0.814			
	PI_5	0.813			

Table 3: Discriminant Validity Analysis

Construct	M	SD	PE	SK	QK	PK	EK	PR	PV	PI
Past Experience (PE)	3.12	1.049	**0.891**							
Subjective Knowledge (SK)	3.17	1.188	0.627**	**0.826**						
Quality Knowledge (QK)	3.09	1.182	0.705**	0.795**	**0.989**					
Price Knowledge (PK)	3.11	1.191	0.627	0.695**	0.650**	**0.835**				
Environment Knowledge (EK)	3.16	1.126	0.710**	0.609**	0.773**	0.630**	**0.841**			
Perceived Risk (PR)	2.89	0.916	0.203**	-0.439**	0.360**	-0.414**	-0.307**	**0.925**		
Perceived Value (PV)	3.12	1.080	0.659**	0.624**	0.579**	0.605**	0.725**	-0.282**	**0.897**	
Purchase Intention (PI)	3.11	1.053	0.654**	0.740**	0.756**	0.783**	0.714**	-0.342**	0.661**	**0.803**

**. Correlation is significant at the 0.01 level (2-tailed).

a. Listwise N=394

Structural Model Analysis

AMOS 21 was used to conduct Confirmatory Factor Analysis (CFA) by applying Chi-square test for goodness-of-fit. The goodness of fit indices from structural model analysis are as follows: chi-square value was 1815 with 838 degrees of freedom, ratio of chi-square to degrees of freedom ($\chi 2/df$) was 2.17 (< 5.0) and meets the set criteria (Bagozzi et al., 1991, Lee & Tsai, 2005). Other indices include: CFI = 0.927, AGFI: 0.903, NFI: 0.913, GFI = 0.937, IFI = 0.901, RMSEA = 0.065, TLI= 0.927. These values indicate good fit because they meet the acceptable criteria (Kline, 2011; Wu & Chang, 2005).

Relationships between variables were measured in terms of β values. Overall influence of predictors on dependent variables was ascertained with R^2. In first step, direct influences of previous experience, subjective knowledge, quality knowledge, price knowledge, and environment knowledge were assessed. Previous experience and subjective knowledge significantly influence purchase intention with values of ($\beta = 0.206$, $p < 0.01$), and ($\beta = 0.427$, $p < 0.01$) respectively. These findings support hypothesis 1 and 2. Quality knowledge, price knowledge, and environment knowledge also significantly influence purchase intention with values of ($\beta = 0.217$, $p < 0.01$), and ($\beta = 0.274$, $p < 0.01$), and ($\beta = 0.414$, $p < 0.01$) respectively.

Intention to buy remanufactured phones is predicted by perceived risk and perceived value. The findings support Hypotheses 8 and 9. Perceived risk has negative influence on purchase intention ($\beta = -0.214$, $p < 0.01$) and perceived value has positive impact on this intention ($\beta = 0.253$, $p < 0.01$). From demographic variables, only gender correlates with purchase intention ($\beta = -0.158$) which implies that females are more likely to purchase remanufactured mobile phones. Model suggests 39% overall variance in purchase intention ($R^2 = 0.390$).

Knowledge of quality has negative influence on perceived risk ($\beta = -0.205$, $p < 0.01$). Price knowledge also has negative influence on perceived risk ($\beta = -0.309$, $p < 0.01$). Quality knowledge and price knowledge explain 69% variance in perceived risk ($R^2 = 0.690$). These findings support hypotheses 3 and 5.

Quality knowledge, price knowledge, and environment knowledge significantly influence perceived value with values of ($\beta = 0.431$, $p < 0.01$), ($\beta = 0.308$, $p < 0.01$), and ($\beta = 0.670$, $p < 0.01$) respectively. There is the strongest influence of environment knowledge on perceived value. There is 55% variance in perceived value due to these three variables ($R^2 = 0.550$). These results support hypotheses 4, 6, and 7.

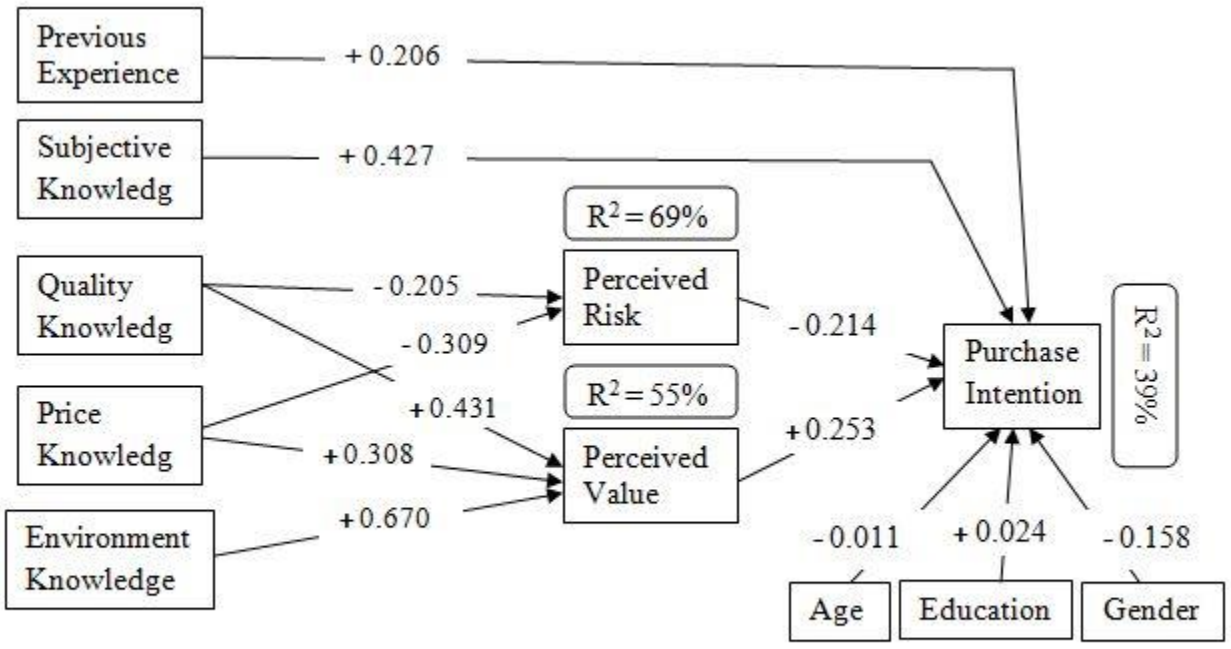

Fig. 2. Structural Model Results

Discussion and implications

Discussion

This research paper aimed to develop and test a model that investigates the impact of knowledge forms (previous experience and subjective knowledge), perceived risk, and perceived value on purchase intention. The model specifically examined how objective knowledge related to remanufactured mobile phones (quality, price, and environment) influences the risk and value perceived by consumers. The findings of this research provide several insightful conclusions.

The confirmation of all hypotheses validates the model's validity, indicating that the hypothesized relationships were significant, with the exception of two demographic variables (age and education). The results highlight the influence of perceived risk and value on consumers' intentions to purchase remanufactured mobile phones, underscoring the role of consumers' assessments of value and risk in their economic and purchasing decisions. These findings align with previous studies conducted by Mitchell and Boustani (1994) and Agostini et al. (2021), which concluded that consumers assess values and risks and make trade-offs between them, consistent with prospect theory.

Among the three knowledge considerations, environment knowledge exhibited the strongest impact on perceived value (+ 0.670), suggesting that it is a decisive determinant affecting purchase intention. Environmentally conscious and well-informed consumers perceive the value of remanufactured products, such as mobile phones, in this study. This finding supports the arguments put forth by previous researchers such as Michaud and Llerena (2011) and Hazen et al. (2012a). However, Atasu et al. (2008b) suggested that the number of environmentally conscious consumers may be relatively small. Previous studies have presented diverse findings on this matter, with studies by de Brito and Dekker (2003) and Michaud and Llerena (2011) demonstrating strong relationships, while others suggest insignificant relationships (Atasu et al., 2008a; Belz & Schmidt-Riediger, 2010).

Quality knowledge exerts a significant but slightly lesser impact than environment knowledge, indicating that the quality of remanufactured mobile phones enhances perceived value. Price, on the other hand, has the least effect on perceived value but remains statistically significant (+ 0.308). These findings are consistent with previous studies conducted by Michaud and Llerena (2006), Guide and Li (2010), and Mollenkopf et al. (2010), which suggest that low-price strategies are important for attracting and convincing consumers to purchase remanufactured

products. The awareness of quality and price also negatively influences the perceived risk associated with remanufactured mobile phones. These empirical findings further support the research conducted by Agostini et al. (2021) regarding the purchase of remanufactured products.

Implications

The eco-friendly approach of using remanufactured products promotes sustainable consumption by reducing the use of materials, labor, energy, and other resources. Remanufacturing contributes to protecting the environment and minimizing waste in landfills, as a significant portion of materials are reused. Consumers play a vital role in driving the demand for remanufactured products through their intentions and purchasing behavior. As a result, research on remanufactured products and consumers' intentions has gained significant attention from researchers who seek to understand the determinants that influence consumers to buy such products. Rooted in prospect theory and learning theory, the present research contributes to the existing literature by exploring the impact of different forms of knowledge on consumers' perceptions and intentions towards remanufactured products, specifically focusing on mobile phones. The study confirms the research findings of Wang and Hazen (2016) in relation to Prospect Theory and expands upon their research model by incorporating two additional variables: previous experience and subjective knowledge.

The role of previous experience and subjective knowledge is crucial in the model and has often been overlooked in previous studies on product remanufacturing. This research emphasizes the influence of consumers' decision-making processes based on their perceptions of risks and values. Previous experience represents knowledge that can be studied through the lens of learning theory, as consumers learn from their own past experiences with remanufactured mobile phones. Subjective knowledge, on the other hand, represents consumers' beliefs and thoughts about such products. Both previous experience and subjective knowledge contribute to understanding consumers' intentions towards remanufactured products.

The findings of this research have practical implications for companies and firms in the remanufacturing industry. Managers and decision-makers involved in remanufacturing can benefit from the insights by understanding consumers' trade-offs between quality, price, and environmental benefits when evaluating refurbished products. They can encourage potential consumers to purchase remanufactured phones and other products by ensuring quality at

affordable prices. Furthermore, they can play a more significant role in environmental sustainability by enhancing the understanding of environmentally conscious consumers. Companies can also raise awareness among consumers who have little or no knowledge about the environmental benefits of remanufactured products, thus promoting their businesses while reducing resource consumption. By understanding the findings of this research, remanufacturers can focus on the aspects of remanufactured products that are most important to consumers.

Governments and environmental protection agencies can utilize the research findings for educational and awareness purposes, encouraging people to contribute to environmental preservation and cost savings by purchasing remanufactured phones. The findings are also valuable in formulating industry policies. This study highlights the significant role of perceived risk and perceived value as predictors of purchase intention. The mobile industry, remanufacturers, and the government should collaborate to mitigate risks by establishing standards and systems to evaluate the remanufacturing process. Governments can establish authorities or departments to monitor remanufacturing activities and ensure the quality of replaced or used parts. These authorities or agencies can be empowered to award certifications to those involved in remanufacturing. Such collaborative efforts can assure consumers that remanufactured mobile phones possess the same quality as new ones but with lower associated risks. Another practical implication of this research is the importance of providing consumers with remanufacturing knowledge. The study revealed that not every consumer understands the term "remanufactured," and there may be skepticism surrounding such mobile phones. Companies and remanufacturers can raise awareness through marketing efforts and provide informational materials to retailers for display in shops. This can help educate consumers who are better able to understand the concept and benefits of remanufactured mobile phones.

Conclusion

The aim of this research was to investigate the influence of different dimensions of knowledge on consumers' risk and value perceptions and how these perceptions impact their intention to purchase remanufactured phones. The findings of the research support all of the proposed hypotheses. This research paper contributes to the existing literature by examining the determinants of remanufactured or refurbished phones specifically in the context of Pakistan.

From a consumer perspective, the research findings have implications for governments, environmental agencies, and other stakeholders. These entities can develop and implement

strategies to promote the adoption of refurbished products. By raising awareness and providing information about the benefits of remanufactured phones, they can encourage consumers to consider and choose these products. This can contribute to sustainable consumption practices and reduce the environmental impact associated with the production and disposal of electronic devices.

Limitations and Future Research

This research has several limitations that should be acknowledged. Firstly, the study was conducted in a limited number of cities within a single district due to the lack of funding, making it difficult to cover a wider geographical area. Future research could aim to include a broader range of locations, potentially spanning multiple districts or regions. Secondly, the study only included three demographic variables (age, education, and gender) as part of the analysis. Future research could consider incorporating additional demographic variables such as income levels, ethnicity, employment status, and house ownership to provide a more comprehensive understanding of the factors influencing consumers' perceptions and intentions.

Thirdly, this study relied on survey-based research where respondents filled out questionnaires. While this approach provides valuable insights, future research could consider conducting observations within retail shops to directly observe participants making their purchase decisions. This could provide more nuanced information about the actual behaviors and decision-making processes of consumers. Fourthly, the sample size of the study was 394 participants. Conducting further studies with larger sample sizes would enhance the generalizability and statistical power of the findings. Additionally, it would be beneficial for other researchers to investigate the validity of the results in different product contexts, as this study specifically focused on remanufactured mobile phones. Examining the applicability of the findings to other product categories would contribute to a more comprehensive understanding of consumer behavior.

Lastly, while this research developed and studied the model components using learning theory and prospect theory, future researchers could make amendments or augmentations to the model for further studies, incorporating additional theories or variables that may provide a more comprehensive understanding of consumer perceptions and intentions. Despite these limitations, this research has made a contribution to the field of closed-loop supply chain and remanufacturing.

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Questionnaire Remanufactured Mobile Phones

Section 1 **Previous Experience**

To what extent you think that you have experience of using Remanufactured Mobile Phones.
Please indicate each item on the following scale.

1= Strongly Disagree	2= Disagree	3= Neutral (Neither agree nor disagree)	4= Agree	5= Strongly Agree

Particulars	1	2	3	4	5
My experience with remanufactured mobile phones has been very good.					
There have been remanufactured mobile phones in my home.					
I am familiar with the performance of remanufactured mobile phones.					
I am very satisfied with remanufactured mobile phone/s.					
After experience of remanufactured mobile phones, I recommend these phones to my friends and relatives.					

Section 2 **Subjective Knowledge**

To what extent you think that you have knowledge of using Remanufactured Mobile Phones.
Please indicate each item on the following scale.

1= Strongly Disagree	2= Disagree	3= Neutral (Neither agree nor disagree)	4= Agree	5= Strongly Agree

Particulars	1	2	3	4	5

I know pretty much about remanufactured mobile phones.					
I feel very knowledgeable about remanufactured mobile phones.					
I have heard of most of the remanufactured mobile phones that are around.					
I know how to judge the quality of remanufactured mobile phones.					
I can tell if a remanufactured mobile phone is worth the price or not.					

Section 3 Quality Knowledge

To what extent you actually know about quality of Remanufactured Mobile Phones.
Please indicate each item on the following scale.

1= Strongly Disagree	2= Disagree	3= Neutral (Neither agree nor disagree)	4= Agree	5= Strongly Agree

Particulars	1	2	3	4	5
Remanufactured mobile phones have features of new phones at a cheap price.					
Performance of remanufactured mobile phone is same as the performance of new phone.					
Specifications of remanufactured mobile phones can also be upgraded like new mobile phones.					
The replaced parts of a remanufactured mobile phone have good quality.					
Remanufactured and new mobile phones have same quality and life.					

Section 4 Price Knowledge

To what extent you actually know about price of Remanufactured Mobile Phones.
Please indicate each item on the following scale.

1= Strongly Disagree	2= Disagree	3= Neutral (Neither agree nor disagree)	4= Agree	5= Strongly Agree

Particulars	1	2	3	4	5
The price of remanufactured mobile phones is very low.					
The price of remanufactured mobile phones is more affordable.					
Remanufactured mobile phones are good products for the price being charged.					
Low priced remanufactured mobile phones are good value for money.					

Section 5 Environment Knowledge

To what extent you actually know about environmental impact of using Remanufactured Mobile Phones.
Please indicate each item on the following scale.

1= Strongly Disagree	2= Disagree	3= Neutral (Neither agree nor disagree)	4= Agree	5= Strongly Agree

Particulars	1	2	3	4	5
Remanufactured mobile phones reduce electronic waste.					
There are uniqueness and pride in using remanufactured mobile phones.					
Remanufacturing does not exploit the nature excessively.					

Use of remanufactured mobile phone conserves the environment sufficiently.					
Use of such mobiles supports the promotion of green (remanufactured) products.					

Section 6 Perceived Risk

To what extent you perceive about risk associated with use of Remanufactured Mobile Phones.
Please indicate each item on the following scale.

1= Strongly Disagree	2= Disagree	3= Neutral (Neither agree nor disagree)	4= Agree	5= Strongly Agree

Particulars	1	2	3	4	5
I am afraid that the performance of remanufactured mobile phones is inferior to performance of new phones.					
I am afraid that the quality and performance of remanufactured phone would cause economic loss.					
I perceive that warranty and after-sale service of remanufactured mobile phones are not good, and I would waste time and money.					
Remanufactured mobile phones can lead to bad results.					
Getting a remanufactured phone would cause me to worry.					
Remanufactured products have uncertain outcomes.					

Section 7 Perceived Value

To what extent you perceive about value associated with use of Remanufactured Mobile Phones.
Please indicate each item on the following scale.

1= Strongly Disagree	2= Disagree	3= Neutral (Neither agree nor disagree)	4= Agree	5= Strongly Agree

Particulars	1	2	3	4	5
Buying remanufactured mobile phones can lower purchase cost compared to buying new phones.					
Compared to new mobile phones, buying remanufactured phones can lead to resource and energy savings.					
Buying remanufactured mobile phones can reduce harmful effects to the environment.					
Buying a remanufactured mobile phone is getting good value for the money I spend.					
I feel that acquiring a remanufactured mobile phone meets both my quality and price requirement.					

Section 8 Purchase Intention

To what extent you intend to purchase Remanufactured Mobile Phones.
Please indicate each item on the following scale.

1= Strongly Disagree	2= Disagree	3= Neutral (Neither agree nor disagree)	4= Agree	5= Strongly Agree

Particulars	1	2	3	4	5
I am intended to purchase remanufactured mobile phone.					

I consider remanufactured mobile phone as a choice when buying mobile phone.					
I would purchase remanufactured mobile phone in the future.					
I would encourage people close to me to purchase remanufactured mobile phones.					
When I have to choose between new and refurbished mobile phones, I normally choose the remanufactured mobiles.					

Age:

- ❑ 18-25
- ❑ 26-33
- ❑ 34-41
- ❑ 42-49
- ❑ 50 and Above

Education:

- ❑ Matriculation
- ❑ Intermediate
- ❑ Bachelors
- ❑ Masters and above

Gender:

- ❑ Female
- ❑ Male

(End of Questionnaire; Many thanks for your time and patience)