BEHAVIOURAL INTENTION TO PURCHASE REMANUFACTURED AUTOMOTIVE COMPONENTS: THE MEDIATING EFFECT OF ATTITUDE

Ahmad Asyraf[A], Zukarnain Zakaria[B], Rossilah Jamil[C]

ABSTRACT

Purpose: The aim of this study is to examine the mediating factor of attitude on the consumers' intention to purchase the remanufactured automotive components in Malaysia.

Theoretical framework: The Theory of Perceived Behaviour (TPB) can be expanded, in accordance with Ajzen (1991), by adding new variables or modifying the present paths between variables. As previously mentioned, the TPB contends that attitude, subjective norms, and perceived behavioural control serve as the three pillars that support behavioural intention. However, other researchers asserted that the model's ability to predict actual behaviour may be improved by other variables that are not been included by TPB (Armitage and Conner, 1999, 2001). Therefore, the present study attempts to extend the TPB by including new variables, i.e., perception on the quality, perception about price and environmental consciousness.

Design/Methodology/Approach: The quantitative study used primary data that gathered from 561 vehicle users using purposive sampling. Data were analysed using Partial-Least Square - Structural Equation Modelling (PLS-SEM) to examine the mediating effects and the strength of the relationships among the constructs.

Findings: The results reveal that price (P) and subjective norm (SN) have significant positive relationship with attitude. Furthermore, attitude, subjective norm, price, and perceived behavioural control (PBC) exert significant positive effect on the behaviour intention (BI) to purchase remanufactured automotive components. Moreover, the findings indicate that attitude significantly mediates the relationship between price, subjective norms and behaviour intention.

Research, practical & social implications: The results of this study emphasized that remanufacturers need to implement various marketing strategies including discounts and advertisements to bring positive influence on consumers' behaviour intention to purchase remanufactured automotive components.

Originality/Value: This study extends the Theory of Planned Behaviour (TPB) by incorporating price, quality and environmental consciousness perceptions. The expanded theoretical framework improved the predictive ability of the TPB.

Doi: https://doi.org/10.26668/businessreview/2023.v8i8.1673

[A] Master in Business Administration. Universiti Teknologi Malaysia. Malaysia. E-mail: aasyraf33@live.utm.my
Orcid: https://orcid.org/0000-0001-8875-8286
[B] Doctor of Philosophy in Economics. International Medical University. Malaysia.
E-mail: zukarnainzakaria@imu.edu.my Orcid: https://orcid.org/0000-0003-1448-4483
[C] Doctor of Philosophy, PhD in Development Policy and Management. Universiti Teknologi Malaysia. Malaysia.
E-mail: rosillah@utm.my Orcid: https://orcid.org/0000-0002-0137-0172

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INTENÇÃO COMPORTAMENTAL DE COMPRAR COMPONENTES AUTOMOTIVOS REMANUFATURADOS: O EFEITO MEDIADOR DA ATITUDE

RESUMO

Objetivo: O objetivo deste estudo é examinar o fator mediador de atitude sobre a intenção dos consumidores de comprar os componentes automotivos remanufaturados na Malásia.

Estrutura teórica: A Teoria do Comportamento Percebido (TCP) pode ser expandida, de acordo com Ajzen (1991), adicionando novas variáveis ou modificando os caminhos atuais entre as variáveis. Como mencionado anteriormente, o TCP sustenta que a atitude, as normas subjetivas e o controle comportamental percebido servem como os três pilares que sustentam a intenção comportamental. No entanto, outros pesquisadores afirmaram que a capacidade do modelo de prever o comportamento real pode ser melhorada por outras variáveis que não foram incluídas pela TCP (Armitage and Conner, 1999, 2001). Portanto, o presente estudo tenta ampliar o TCP incluindo novas variáveis, ou seja, percepção da qualidade, percepção sobre preço e consciência ambiental.

Projeto/Metodologia/Abordagem: O estudo quantitativo utilizou dados primários coletados de 561 usuários de veículos usando amostragem intencional. Os dados foram analisados usando Partial-Least Square - Structural Equation Modeling (PLS-SEM) para examinar os efeitos mediadores e a força das relações entre os construtos.

Constatações: Os resultados revelam que o preço (P) e a norma subjetiva (NS) têm relação positiva significativa com a atitude. Além disso, a atitude, a norma subjetiva, o preço e o controle comportamental percebido (CCP) exercem um efeito positivo significativo sobre a intenção de comportamento (BI) de comprar componentes automotivos remanufaturados. Além disso, os resultados indicam que a atitude media significativamente a relação entre preço, normas subjetivas e intenção de comportamento.

Investigação, implicações práticas e sociais: Os resultados deste estudo enfatizaram que os refabricantes precisam implementar várias estratégias de marketing, incluindo descontos e anúncios, para influenciar positivamente a intenção do consumidor de comprar componentes automotivos remanufaturados.

Originalidade/valor: Este estudo estende a Teoria do Comportamento Planejado (TCP) incorporando percepções de preço, qualidade e consciência ambiental. A estrutura teórica expandida melhorou a capacidade preditiva do TPB.

Palavras-chave: Teoria do Comportamento Percebido, Preço, Qualidade, Consciência Ambiental, Componentes Automotivos Remanufaturados.

INTENCIÓN DE COMPORTAMIENTO PARA COMPRAR COMPONENTES AUTOMOTRICES REFABRICADOS: EL EFECTO MEDIADOR DE LA ACTITUD

RESUMEN

Objetivo: El objetivo de este estudio es examinar el factor de mediación de la actitud sobre la intención de los consumidores de comprar los componentes de automoción remanufacturados en Malasia.

Marco teórico: La Teoría de la Conducta Percibida (TCP) puede ampliarse, de acuerdo con Ajzen (1991), añadiendo nuevas variables o modificando las trayectorias actuales entre variables. Como se mencionó anteriormente, la TCP sostiene que la actitud, las normas subjetivas y el control del comportamiento percibido sirven como los tres pilares que apoyan la intención conductual. Sin embargo, otros investigadores afirmaron que la capacidad del modelo para predecir el comportamiento real puede ser mejorada por otras variables que no han sido incluidas por TCP (Armitage y Conner, 1999, 2001). Por lo tanto, el presente estudio intenta extender la BPT mediante la inclusión de nuevas variables, es decir, la percepción sobre la calidad, la percepción sobre el precio y la conciencia ambiental.

Diseño/metodología/enfoque: En el estudio cuantitativo se utilizaron datos primarios obtenidos de 561 usuarios de vehículos mediante muestreo intencional. Los datos se analizaron mediante el Modelo de Ecuaciones Estructurales Parcial-Mínimo Cuadrado (PLS-SEM) para examinar los efectos mediadores y la fuerza de las relaciones entre los constructos.

Hallazgos: Los resultados revelan que el precio (P) y la norma subjetiva (NS) tienen una relación positiva significativa con la actitud. Además, la actitud, la norma subjetiva, el precio y el control conductual percibido (CBP) ejercen un efecto positivo significativo sobre la intención de comportamiento (IC) para comprar componentes automotrices remanufacturados. Además, los hallazgos indican que la actitud media significativamente la relación entre precio, normas subjetivas e intención de comportamiento.

Investigación, implicaciones prácticas y sociales: Los resultados de este estudio enfatizaron que los refabricantes necesitan implementar diversas estrategias de marketing, incluyendo descuentos y publicidad para traer influencia positiva en el comportamiento de los consumidores y la intención de comprar componentes automotrices remanufacturados.

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Originalidad/valor: Este estudio amplía la Teoría del Comportamiento Planificado (TCP) incorporando percepciones de precio, calidad y conciencia ambiental. El marco teórico ampliado mejoró la capacidad predictiva de la BPT.

Palabras clave: Teoría del Comportamiento Percibido, Precio, Calidad, Conciencia Ambiental, Componentes Automotrices Remanufacturados.

INTRODUCTION

Globally, remanufacturing industry has evolved rapidly with the increase in the environmental concerns among manufactures and consumers especially in the developed countries. Rapid technological developments have encouraged industrial firms to adopt new methods and implement technological changes aimed at maintaining their market position and growing (Ahmad and Sulaiman, 2023). Unlike normal manufacturing, remanufacturing focusing on the product recovery. This is because a shorter product life cycle negatively affects the sustainable development due to product disposal issues. Gan *et al.* (2015) argued that shorter product life cycle and the disposal of the products do contribute to the environmental pollution. This situation has encouraged industrial manufacturers and consumers to opt for remanufacturing products.

Remanufacturing industry not only benefiting the environment, but also could contribute to the country's national income and employment opportunities (Mitra, 2015). Sustainable business practices are crucial for long-term success as consumers demand socially and environmentally responsible products and services (Alkhodary, 2023).

In addition, remanufactured products are also characterized by high quality and performance that equivalent to the new products, while the costs of remanufacturing are significantly lower (Wang *et al.*, 2013). Compared to the manufacturing of the Original Equipment Manufacturer (OEM), an average, remanufacturing can reduce the operational costs by 20-50% (Anthony and Cheung, 2007). Remanufacturing industry also offers an astounding untapped global market and high potential future growth especially in the automotive sector (Zahren, 2012).

Automotive product contains various high value and durable components that can be re-used. Therefore, automotive components have high potential for remanufacturing (Steinhiper and Nagel, 2017). Remanufacturing of automotive parts enables the used parts to reach the performance of new original manufactured parts, hence extends the parts' life. For the manufacturing companies, remanufactured automotive parts can be a resource-saving and cost-cutting strategy.

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However, most of the previous studies on remanufactured automotive parts emphasized on the operational challenges and opportunities of OEMs (Sakao and Sundin, 2019). Previous studies were also focusing on the small and medium-sized independent remanufacturers (Golinska-Dawson, Kosacka and Nowak, 2015). Only few studies have focused on consumer perceptions towards remanufactured automotive parts, particularly in the context of developing countries. Therefore, this study intends to fill the gap by emphasizing the importance of perception quality, price, and environmental consciousness of towards consumers' intention to purchase the remanufactured components.

Automotive parts account roughly about two-thirds of global remanufacturing operations (USICT, 2012). However, many consumers do not perceive the advantages of using remanufacturing parts, hence unreceptive toward the products. Most consumers feel uncertain about remanufactured products because they do not know how the products were used before and the steps taken to remanufacture the products (Hatcher, Ijomah and Windmill, 2014). Therefore, enhancing consumers' perception on the quality, price and their environmental consciousness on remanufacturing parts could be the effective way to deal with the above uncertainty issues.

In line with the above discussion, the objective of this paper is to examine the important of consumers' perceptions in influencing their purchase intention towards remanufactured automotive parts. In this paper, on top of the core constructs suggested by the Theory of Planned Behaviour; namely attitude, subjective norms, perceived behavioural control, and behaviour intention, three additional constructs were included in the framework of the study. The constructs are quality perception, price perception, and environmental consciousness. This study also explores the mediating role of attitude in the relationship between the perception on the quality, the perception on price, consumers' environmental consciousness, and the purchase intention towards remanufactured automotive parts.

LITERATURE REVIEW

Remanufacturing has been identified as one of the strategies that could contribute to the sustainability goal. In general, remanufacturing is an industrial process through which used or end-of-life item is restored to the quality and functionality similar to new product and normally will be given the same warranty period just like a new product (Singhal, Jena and Tripathy, 2019). In essence, remanufacturing may be characterized as the return of a used product to the production line where it will be dismantled, cleaned, reconditioned, inspected, and reassembled

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to ensure the product has the same quality as a new product (Barquet *et al*., 2013). Each stage is vital to the remanufacturing process, and it requires close supervision to ensure each procedure is carried out effectively.

Remanufacturing preserves the environment by lowering energy and material usage, and economically, produces the products at a lower cost (Mukherjee and Mondal, 2009). Raz, Ovchinnikov, and Blass (2017) stated that remanufacturing always gives advantages to the society. The benefits of remanufacturing include a cheaper pricing product, saving of material and energy resources, and the creation of new employment as remanufacturing is typically a labour-intensive process (Matsumoto *et al*., 2016). Additionally, remanufacturing helps waste minimization and increased environmental consciousness among customers (McConocha and Speh, 1991).

Despite enormous breadth of remanufacturing operations across a globe, research on consumers' perceptions towards remanufactured goods is still insufficient (Abbey *et al*., 2015; Gaur *et al*., 2015). Researchers have discovered that consumers' perceptions on remanufactured items may affect their behaviour, subsequently their purchase decisions. Perception is the way humans may comprehend their environment. Peoples' attitudes and preferences towards an object are strongly impacted by the way they perceived things (Matsumoto, Chinen and Endo, 2018).

The Theory of Planned Behaviour (TPB) has extensively used for predicting and explaining human behaviour. TPB stated that human action is guided by three beliefs: behavioural beliefs, normative beliefs, and control beliefs. A behavioural belief refers to the individual's belief about the results of a behaviour which creates the individual's attitude toward the behaviour. Normative belief, is defined as an individual's perception of how a behaviour will be judged by significant others, also known as subjective norm. Control belief refers to an individual's perceptions of the control he or she has over the behaviour, which is connected to perceived behavioural control (Ajzen, 1991).

TPB shows that behavioural intention can be predicted by attitudes, the subjective norm, and perceived behavioural control. In brief, the more favourable a person's attitude and perceived behavioural control about a behaviour and the more favourable the subjective norm, the stronger the person's intention will perform the behaviour. The stronger the person's intention, the more likely he or she will perform the behaviour (Ajzen, 1991).

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In summary, TPB postulates that individual's intentions and his or her subsequent behaviours are determined by three factors: attitudes toward the behaviour, subjective norms, and perceived behavioural control (see Figure 1).

Figure 1 - Theory of Planned Behaviour Framework
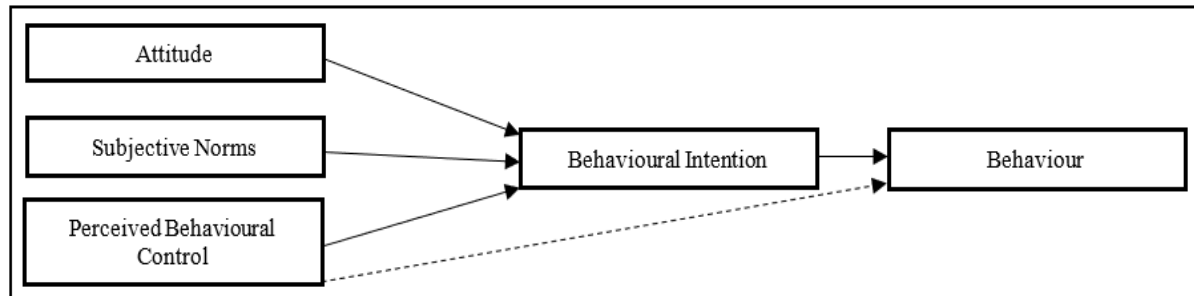
Source: Prepared by the authors (2023)

Ajzen (1991) describes behavioural intention as the individual's motivation whether to perform a behaviour or not. The most accurate prediction of behaviour comes from behavioural intention (Ajzen and Fishbein, 1980). Perloff (2003) later defined behavioural intention as the intention to undertake a specific behaviour and a plan to carry out the behaviour. Scholars frequently focusing on behavioural intentions rather than the actual behaviour because behavioural intentions considerably an accurate predictor for people's actual behaviour. Additionally, behaviour intentions, behaviour and actions are all classified as "conative" (Ray, 1973). As a result, it is reasonable to refer to behavioural intentions rather than behaviour in the present study.

In this study, the behaviour intention is the decision whether to purchase the remanufactured automotive components or not. According to Wang *et al*. (2013), purchase intention can be used as a predictor for consumers' purchase behaviour. Jimenez-Parra *et al*. (2014) demonstrated that purchase intention for remanufactured laptops is influenced by purchasing attitude, subjective norms, incentives, and elements from the marketing mix strategy. Wang *et al.* (2013) emphasized that purchasing attitude, perceived behavioural control, perceived risk, perceived reward, and product knowledge influence the purchase intention for remanufactured automotive components.

Attitude is described as a predisposition to respond consistently in positive or negative manner to a particular item (Fishbein and Ajzen, 1975). Generally, attitude has been seen as a latent variable that influence behaviour. The phrase "attitude towards an activity" refers to the degree to which individuals have a positive or negative judgement when they engage in a certain behaviour (Ajzen, 1991; Han *et al*., 2009; Tonglet *et al*., 2004). The greater an individual's

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preference on another person's behaviour, the greater the possibility that he or she will exhibit the same behaviour.

Attitude is a psychological tendency that exhibited in the appraisal of distinct things with various degrees of favour or disfavour (Eagly and Chaiken, 1993). These psychological preferences are present in every human in the form of assessment, which comprises of all forms and categories of evaluation, whether overt or covert, or cognitive, emotional or conative in origin. Shook and Bratianu (2010) stressed that attitude is developed based on the thoughts about probable outcomes. The more favourable the results, the stronger the intention to engage in the activity.

Weigel *et al.* (2014) observed that attitude has consistently been a key predictor of intention across a range of situations and activities. Maichum *et al.* (2016) verified that attitude had a strong favourable influence on purchase intention for green items. Wang *et al.* (2020) evaluated customers' perceptions regarding remanufactured products purchase intentions in China and found that consumers had both experiential and instrumental attitudes towards remanufactured items. Kumar (2017), Ma *et al.* (2017) and Zhu *et al.* (2020) also obtained similar findings. Wang *et al.* (2013) revealed that attitude has a favourable and substantial influence on the purchase intention of remanufactured automobile components. Meanwhile, Jimenez-Parra *et al.* (2014) discovered that purchasing attitude strongly influence the purchase intention of refurbished laptop.

Therefore, this study anticipates that, consumer's attitude towards remanufactured automotive components is greatly affect their purchase intention on remanufactured automotive parts.

H1:   Attitude has a significant positive influence on consumers' intention to purchase remanufactured automotive parts.

Ajzen (1991) defined subjective norms as the perceived social pressure to perform or not perform a behaviour. According to Verma and Chandra (2017), subjective norms are also described as the perspectives of those who are influential in an individual's life and have the power to affect his or her decision-making (e.g., family, relatives, colleagues, associates, or business partners, friends).

Previous studies have established a significant relationship between subjective norms and behavioural intention. For example, subjective norms have been proven positively influence the behavioural intention of environmental impact assessment participation (Persada, 2016), and green skincare purchasing behaviour (Puspita, 2017). Research also revealed that

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subjective norms influence purchasing decisions for remanufactured products (Jimenez-Parra *et al.*, 2014; Khor and Hazen, 2017). Maichum *et al.* (2016) discovered that subjective norms significantly influence the purchase intention of environmentally friendly products in the Thai context.

Jimenez-Parra *et al.* (2014) emphasized that subjective norms is important determinant for the purchase intention of remanufactured laptop. Past research has also established a positive relationship between subjective norms and consumer decision-making (Khan *et al.*, 2019; Soliman, 2019), particularly when it comes to consumer's intentions towards remanufactured components (Kumar, 2017; Ma *et al.*, 2017; Pisitsankkhakarn and Vassanadumrongdee, 2020; Wang *et al.*, 2020; Zhu *et al.*, 2020).

In this study, the subjective norms are the social pressures felt by consumers to purchase remanufactured automotive components. Social pressure is expected positively influence consumers' intention to purchase remanufactured automotive components. The hypotheses of this study are:

H2: *Subjective norms has a significant positive influence on attitude.*

H3: *Subjective norms has a significant positive influence on consumers' intention to purchase remanufactured automotive parts.*

Perceived behavioural control refers to an individual's perception of how easy or difficult it is to do a certain behaviour (Ajzen and Fishbein, 2005). Perceived behavioural control is a different compared to the Rotter's locus of control (1966). The locus of control is associated with one's beliefs, which are consistent in all circumstances. In contrast, perceived behavioural control may vary according to circumstances and the types of activities to be performed. The locus of control refers to one's idea that success in achieving something is depending on one's own effort (Rotter, 1966). However, if this belief is associated with specific accomplishments, it is referred to as perceived behavioural control.

Perceived behaviour control has been found positively influence the behavioural intention of environmental impact assessment participation (Persada, 2016) and green skincare purchasing behaviour (Puspita, 2017). In addition, past studies have also revealed that perceived behavioural control has a positive and significant effect on consumers' intention to perform a behaviour (Abbasi *et al.*, 2020; Iranmanesh *et al.*, 2019). Wang *et al.* (2013) revealed that purchase intention of remanufactured automotive parts is influenced by perceived behavioural control.

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In this study, perceived behavioural control is measuring consumer's ability to control the purchase of remanufactured automotive parts. What consumers perceive about their ability to purchase remanufactured automotive components is expected to influence their intention to purchase those items. In the other words, if consumers perceive that they have good control when purchasing remanufactured automotive components, they will purchase the remanufactured parts.

Therefore, this study proposed that perceived behavioural control positively influences the purchase intention of remanufactured automotive components. Thus, this study intends to test the following hypotheses.

H4: *Perceived behavioural control has a significant influence on attitude.*

H5: *Perceived behavioural control has a significant positive influence on consumers' intention to purchase remanufactured automotive parts.*

Extension of the Theory of Planned Behaviour

According to Ajzen (1991), the TPB can be extended by incorporating new variables or changing the current paths among variables. As already stated, the TPB suggests that behavioural intention is a function of three pillars: attitude, subjective norms and perceived behavioural control. However, some researchers argued that there are other variables not included in the TPB, which are vital to improve the model's in predicting the actual behaviour (Armitage and Conner, 1999, 2001). Therefore, the present study attempts to extend the TPB by including new variables, i.e., perception on the quality, perception about price and environmental consciousness.

Perception on product quality relates to a consumer's expectations on a remanufactured product's "overall perfection or superiority" (Zeithaml, 1987). Ostlin *et al.* (2008) discovered that consumers' perception on the quality of remanufactured components is negatively proportional to the cost of core collection. As a result, when customers sell a returned core at a lesser price, they typically consider the remanufactured core to be of inferior quality. Additionally, Abbey *et al.* (2017) found that perceived quality has a favourable influence on willingness to pay for remanufactured items.

Guide and Jayaraman, (2000), Geyer and Jackson, (2004), and van Nunen and Zuidwijk, (2004) stated that customers regard the quality of the used items as ambiguous. Hazen *et al.* (2012) found that the quality level of remanufactured products relates to the ambiguity of customers' perceptions. Therefore, the degree of uncertainty and associated risks can be

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reduced by educating the consumers on the quality of the remanufactured products. Some customers perceived remanufactured components as second-hand components or outmoded, unreliable components. While others had inadequate information and comprehension of the quality of remanufactured components.

Choudhary and Singh (2014) stated that customers with a better knowledge towards remanufactured components tend to have a good perception on the quality of remanufactured components, hence more ready to purchase them. Thus, it can be stated that by educating the customers on the quality of remanufactured goods would enhance the consumers' confidence level and their perspective towards the remanufactured components and their purchase intention. Therefore, this study argued that perception on quality influence consumers' behaviour intention to purchase remanufactured automotive components.

H6:   Perception on quality has a significant positive influence on attitude.

H7:   Perception on quality has a significant positive influence on consumers' intention to purchase remanufactured automotive parts.

Remanufactured, reconditioned, and reused components are often cost lower than OEM. This is a main reason for customers to buy remanufactured components (Watson, 2008). In the other words, the market of remanufacturing components depends on its lower price advantages against the OEM components. Debo *et al.* (2003) stated that customers normally perceived the value of remanufactured components is lower than the OEM components. Therefore, Granstorm (2006), in his study found that most of consumers prefer to purchase OEM components.

The understanding of customers on the pricing of remanufactured items is that it should be cheaper than the price of the OEM. Zeithaml (1988) revealed that lower price was the main factor to purchase refurbished components. In reality, the price of remanufacturing components is 30-45% cheaper compared to the price of manufacturing product but needs up to 20% additional working process as compared to produced components (Wang and Hazen, 2016). Abbey, Blackburn and Guide (2015) proposed that price reductions might boost the desirability of remanufactured items.

Various research (for instance, Abbey *et al.*, 2015; Jiménez-Parra *et al.*, 2014; Wang *et al.*, 2018) found that price reductions positively affect the perceived value and customer purchase intention towards remanufacturing components. This is because customers are expecting for some price benefits when they purchase the remanufactured good. The cheaper price of remanufactured items stimulates their purchase (Yilmaz and Belbag, 2016). Therefore,

this paper argued that consumers' perception about the price affect their behaviour intention to purchase remanufactured automotive components.

> H8:   *Perception of price has a significant influence on attitude.*

> H9:   *Price perception has a significant positive influence on consumers' intention to purchase remanufactured automotive parts.*

In general, environmental consciousness, refers to consumers' cognitions, perceptions, concerns, and sensitivity towards environmental challenges, as well as their attempts to strengthen human relationships (Chen and Hung, 2016). Environmental consciousness drives remanufacturing processes because remanufacturing is more ecologically beneficial since it utilizes less energy and less raw material.

Consumers who are environmentally conscious generally concern about environmental issues. Therefore, they have a strong feeling of duty to embrace environmentally friendly products and services (Bittar, 2018). According to Watson (2008), customers frequently voice out and support any concerns relating to environmental consciousness. However, when it comes to buying reused or remanufactured components, the environmental conscience of customers is less significant.

Past studies revealed that customers tend to think the value of remanufactured components as less than OEM components unless the consumers are told about the environmental advantages of remanufacturing (Michaud and Llerena, 2006). This indicates that environmental consciousness has an influence on customers' inclinations to buy the items or services (Mishal *et al.* 2017). For example, Yue *et al*. (2020) observed that environmental concern influences green consumption intention. Chen and Hung (2016) demonstrated that consumers who have a greater level of environmental consciousness are more inclined to purchase green things. Wang, Pham and Dang (2020a) discovered that customers' environmental consciousness impacts customers' inclination to purchase organic food. Research by Kautish and Sharma (2021) also suggested that environmental consciousness has a major impact on behaviour intentions.

In summary, it can be argued that environmental consciousness might impact the perception and purchasing intention towards remanufactured items. Therefore, this study asserted that environmental consciousness is strongly affect consumers' behaviour intention to purchase remanufactured automotive components.

> H10:   *Environmental consciousness has a significant positive influence on attitude.*

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H11: Environmental conscientiousness has a significant positive influence on consumers' intention to purchase remanufactured automotive parts.

This paper also evaluates the mediating effect of attitude on the relationship between quality perception, price perception, environmental consciousness, subjective norms, perceived behavioural control and behaviour intention. For example, attitude played a full mediation role on the purchase intention of "Halal" brands in India (Garg and Joshi, 2018). Meanwhile, Zainal, Harun, and Lily (2017) revealed that attitude partially mediate the trust in electronic word-of-mouth sources and the desire to follow electronic word-of-mouth among Malaysian tourists.

Attitude toward money has successfully moderated the effects of financial literacy and perceived financial confidence on students' financial behaviour (Susilowati *et al*., 2017). Meanwhile, Chin, Isa and Alodin (2019) discovered that attitude towards brand considerably influenced the link between endorser credibility and brand credibility in altering customer's buying intention. Additionally, attitude towards advertisement was found partially mediate the association between celebrity's trustworthiness and buying intention of footwear items (Ong, 2015). Attitude was also found to have a full mediation impact on the association between environmental knowledge and green purchasing intention (Indriani, Rahayu and Hadiwidjoyo, 2019). Lim *et al*. (2017), in their study also discovered that the consumer attitude strongly mediated the relationship between source credibility, source attractiveness, product match-up and buy intention.

Based on the studies above, attitude is expecting to have a substantial mediating influence towards purchasing intention. Therefore, it is appropriate to incorporate attitude as a mediating variable in the framework. This study anticipates that attitude would mediates the relationship between quality perception, price perception, environmental consciousness, subjective norms, perceived behavioural control and behaviour intention of customers to purchase remanufactured automotive components. Based on this discussion, it is suggested that:

H12: Attitude significantly mediates the relationship between perception of quality and behaviour intention to purchase remanufactured automotive components.

H13: Attitude significantly mediates the relationship between perception of price and behaviour intention to purchase remanufactured automotive components.

H14: Attitude significantly mediates the relationship between environmental consciousness and behaviour intention to purchase remanufactured automotive components.

H15: Attitude significantly mediates the relationship between subjective norms and behaviour intention to purchase remanufactured automotive components.

H16: Attitude significantly mediates the relationship between perceived behaviour control and behaviour intention to purchase remanufactured automotive components.

Theoretical Framework

Based on the discussion in the literature section above, the conceptual framework the describing the relationships between the variables studied are as shown in Figure 1.

Figure 2 - Theory of Planned Behaviour Framework
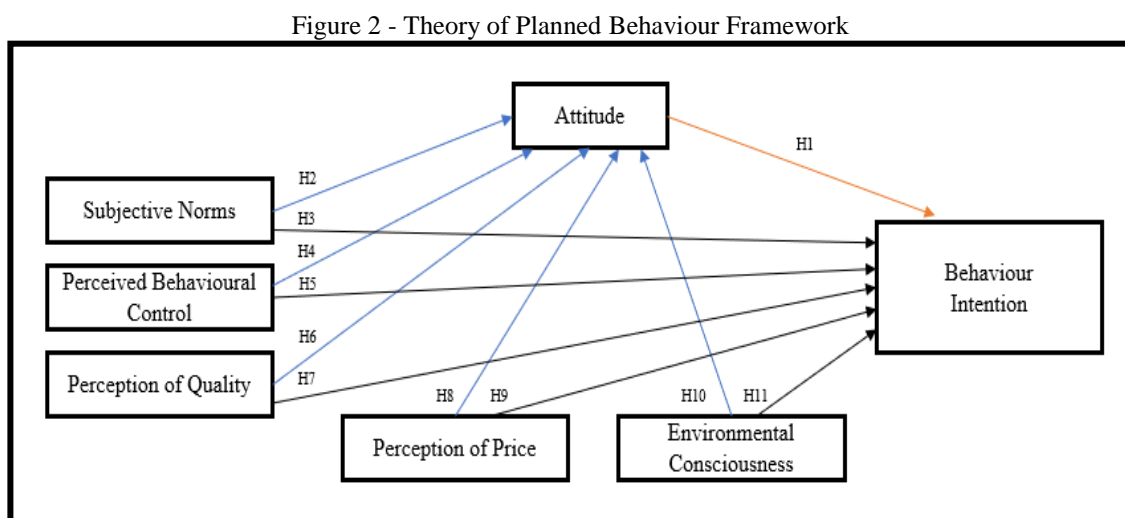
Source: Prepared by the authors (2023)

DATA AND METHODOLOGY

This quantitative study used primary data that collected using questionnaire consisting of 35 items. The items were measured using a five-point Likert scales (1 = strongly disagree to 5 = strongly agree). The population of this study were vehicles owners in three major states in Malaysia: Johor, Selangor and Kuala Lumpur. The three states were chosen due to the high number of vehicle users. The non-probability sampling method was used to draw the required sample. The sample size was determined based on Hair *et al*.'s (2014) rule of thumb, i.e., one to five ratio. Based on the required sample size, a total of 597 questionnaires were distributed, and out of this a total of 566 were returned. However, five questionnaires were discarded from further analysis due to serious missing values issue. Thus, in the final analysis, a total of 561 questionnaires have been used, representing a response rate of 94%.

This study employed the Partial Least Square – Structural Equation Modelling (PLS-SEM) in performing the data analysis. PLS-OEM offers small sample size requirements,

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simpler testing of moderating relationships and capability to generate formative indicators (Shackman, 2013). The data was analysed in two stages comprised of measurement model and structural model. The validity and reliability of the variables including convergent validity, discriminant validity and reliability are evaluated through factor loading analysis as part of the measurement model. Meanwhile, for the structural model, the tests involve are R square (R^2), effect size (f^2), predictive relevance (Q^2), goodness of fit (GoF) index as well as the importance and performance matrix (IPMA).

RESULTS AND DISCUSSION

This chapter presents the results and discussion generated from the data analysis. The analysis is categorised into two sections, which included the demographic and descriptive analysis for the first section, followed by discussion on the results obtained from PLS-SEM approach. In this section, the approach was used to analyse the measurement model including construct validity and reliability analysis. In addition, the structural model was also analysed to identify the relationships between research variables in the Theory of Perceived Behaviour as well as quality, price and environmental conscious. Finally, the results of hypotheses are presented and discussed aligned with the research objectives.

Profile of Respondents

Table 1 summarizes the respondents' demographic profile. The numbers of male and female respondents involved in this survey were well represented; male (56%) and female (44%). Most of the respondents were between 29 to 39 years old, which is about 41% of the respondents. This is followed by the respondents under 29 years old (38%). The age group of 40 to 49 years old consisted of 15%, while above 50 years old is 6%. Regarding the level of education, statistics in Table 1 showed that majority of the respondents (50%) possessed a degree, followed by post-graduate qualification (34%), and 9% were diploma holders. Meanwhile, about the respondents' household income, most of them earned below RM4000 (41%), followed by income group between RM4000 to RM9000 (40%). Only 19% of the respondents earned more than RM9000 per month.

Table 1 - Respondents' Demographic Profile

Demographic variable	Classifications	Frequency	Percentage (%)
Gender	Male	314	56
	Female	247	44
Age	Below 29 years old	213	38
	29 - 39 years old	232	41

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	40 - 49 years old	81	15
	50 years old and above	35	6
Academic qualification	PMR/SPM/STPM	36	7
	Diploma	53	9
	Degree	280	50
	Postgraduate	192	34
Monthly household income	Below RM4000	232	41
	RM4000 - RM9000	225	40
	Above RM9000	104	19

Source: Prepared by the authors (2023)

Vehicle Ownership and Preference

Table 2 presents the profile of the respondents' vehicle ownership. In term of number of vehicles owned, statistics in Table 2 showed that 55% of the respondents only have one vehicle, while 45% have more than one vehicle. Meanwhile, with regard to the respondents' preferences in purchasing a vehicle, the statistics revealed that almost 74% of the respondents preferred to purchase new vehicles, 16% preferred to purchase used or second-hand vehicles, and 10% preferred recondition vehicles.

Table 2 - Characteristics of the Respondents' Vehicle Usage

Measure	Classifications	Frequency	Percentage (%)
Number of vehicle(s) owned	One	310	55
	2 to 3	218	39
	More than 3	33	6
Preference in purchasing vehicle	New Vehicle	415	74
	Recondition Vehicle	55	10
	Used Vehicle	91	16
Vehicle ownership periods	Less than 3 years	172	31
	3 to 5 years	135	24
	6 to 9 years	163	29
	10 to 15 years	73	13
	More than 15 years	18	3
Main vehicle manufacturers	National vehicle	255	45.5
	Japanese vehicle	221	39.4
	Korean vehicle	19	3.4
	Continental vehicle	64	11.4
	Others	2	0.3
Preference in purchasing automotive parts	OEM parts	455	81
	Remanufactured parts	75	13
	Used parts	31	6

Source: Prepared by the authors (2023)

The distribution of vehicle ownership periods illustrates that about 24% of the respondents have owned their current vehicle for 3 to 5 years, and 13% for 10 to 15 years. Only 3% of the respondents have owned the vehicle for more than 15 years. Meanwhile, with respect to the main manufacturer of the vehicle, 45.5% are owned a national manufactured vehicle, and 39.4% Japanese manufacturer vehicles. This distribution is consistent with the pattern of

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vehicle sales in Malaysia, which dominated by national and Japanese manufacturers. About 11.4% respondents use vehicles from Continental manufacturers and 3.4% own a Korean manufacturers vehicle. Only 0.3% are using vehicles from other manufacturers such as Haval, Maxus, or Chery. Finally, majority of the respondents (81%) are preferred to purchase OEM parts when replacing their automotive parts. Only about 13% of the respondents preferred to purchase remanufactured parts, followed by respondents who preferred to purchase used parts (6%).

Partial Least Square (PLS-SEM) Analysis

The assessment of a model follows a two-step approach: estimates of the measurement model and the structural model (Anderson and Gerbing, 1988; Mohammad *et al*., 2018). Evaluation of the measurement model requires evaluating the validity and reliability of latent variables (LVs), whereas the assessment of the structural model is concerned with the relationships between LVs (Quoquab *et al*., 2018).

It is crucial to examine the presence of Common Method Variance (CMV) before moving forward and testing the measurement model. According to Podsakoff *et al*. (2003), the CMV demonstrates the variance that refers to measurement methods rather than the constructs of interest. To avoid this issue, several steps were taken: first, this study ensured the anonymity of respondents, emphasised that there is no right or wrong answer in the survey. Also, assured that the items that comprise the scale are simple, clear and understandable.

Second, this study utilised the Harman single factor test as suggested by Podsakoff *et al.* (2003). The basic assumption of this technique is that if CMV existed, one factor will account for majority of the variance. Exploratory factor analysis using the principal component analysis was used to conduct this test for the study constructs. The results indicate that the first factor explained less than 50 per cent of the total variance. Thus, CMV was not an issue in this study.

Next, the measurement model which represents the relationship between LVs and their associated items was assessed. In this study, the measurement model contained seven reflective constructs. These constructs include attitude, subjective norms, perceived behavioural control, perception of quality, perception of price, environmental consciousness and behaviour intention. The reliability of these constructs was measured using Cronbach's alpha and Composite Reliability (CR). In the present study, Cronbach's alpha of equal or higher than 0.6 (Hair *et al.*, 2014) was acceptable.

Subsequently, constructs with a composite reliability value of 0.6 and above were retained for analysis (Ramayah *et al*., 2018). These two tests provide some evidence regarding the internal consistency and reliability of the study. Table 3 shows that all latent variables have satisfied the criteria for these two tests.

The validity of the variables was assessed using convergent and discriminant validity. Convergent validity is the degree to which indicators describe a construct converging compared to other indicators (Urbach and Ahlemann, 2010). The representation can be assessed using Average Variance Extraction (AVE). Table 3 presents the results of AVE, which passed the minimum criteria. Therefore, the convergent validity of this study was established.

Table 3 - Constructs Reliability and Convergent Validity Analysis

Construct	Items	Loadings	CA	CR	AVE
Attitude	A1	0.785	0.824	0.876	0.587
	A2	0.875			
	A3	0.805			
	A4	0.889			
	A5	0.789			
Subjective Norms	SN1	0.736	0.855	0.897	0.637
	SN2	0.807			
	SN3	0.757			
	SN4	0.872			
	SN5	0.865			
Perceived Behavioural Control	PB1	0.734	0.940	0.954	0.806
	PB2	0.819			
	PB3	0.715			
	PB4	0.808			
	PB5	0.75			
Perception of Quality	Q1	0.897	0.886	0.917	0.689
	Q2	0.901			
	Q3	0.916			
	Q4	0.905			
	Q5	0.867			
Perception of Price	P1	0.615	0.910	0.933	0.736
	P2	0.798			
	P3	0.88			
	P4	0.858			
	P5	0.814			
Environmental Consciousness	EC1	0.813	0.868	0.899	0.640
	EC2	0.815			
	EC3	0.755			
	EC4	0.798			
	EC5	0.816			
Behaviour Intention	BI1	0.848	0.868	0.904	0.655
	BI2	0.873			
	BI3	0.863			
	BI4	0.873			
	BI5	0.833			

Source: Prepared by the authors (2023)

The purpose of discriminant validity is to ensure that a reflective construct has the strongest relationship with its own indicators in the PLS path model (Hair *et al.,* 2014). The present study utilized Heterotrait-Monotrait ratio of correlations (HTMT) in analysing the discriminant validity. The results of discriminant validity analysis are depicted in Table 4.

Table 4 - Discriminant Validity Analysis

	A	BI	EC	PBC	P	Q	SN
Attitude (A)							
Behaviour Intention (BI)	0.915						
Environmental Consciousness (EC)	0.422	0.389					
Perceived Behavioural Control (PBC)	0.46	0.633	0.399				
Perception of Price (P)	0.869	0.809	0.49	0.493			
Perception of Quality (Q)	0.574	0.537	0.397	0.37	0.648		
Subjective Norm (SN)	0.809	0.766	0.415	0.484	0.728	0.511	

Source: Prepared by the authors (2023)

Based on the results presented in Table 4, all values were below 0.85 and 0.90 except for P ∝ A which possessed HTMT value of 0.869 and BI ∝ A with HTMT value of 0.915. Therefore, it can be concluded that all constructs have established discriminant validity while P ∝ A and BI ∝ A possessed lack of discriminant validity.

To assess the structural model, Hair *et al*. (2014) recommended looking at the significance of the path coefficient, coefficient of determination values (R^2), effect sizes (f^2) and predictive relevance (Q^2). The R^2 represents the combined effect of exogenous LVs on the endogenous LV. Falk and Miller (1992) argued that R^2 should be higher than 0.10 to reach the minimum level of explanatory power. Similarly, Cohen (1988) contended that R^2 values of 0.26, 0.13 and 0.02 are substantial, moderate and weak, respectively. In this study, the values of R^2 of attitude and behaviour intention were 0.688 and 0.751. Respectively, indicates that substantial variance is explained in behaviour intention and attitude by its antecedents.

The result of the PLS algorithm indicates the effect size for attitude ($f^2 = 0.375$) followed by perceived behavioural control ($f^2 = 0.168$) exerts the most significant effect on consumer behaviour intention to purchase remanufactured automotive components when compared to other antecedents.

Similarly, the results of Q^2 confirmed the model's predictive relevance for attitude ($Q^2 = 0.468$) and behaviour intention ($Q^2 = 0.551$). The hypotheses developed for this study were tested using a bootstrapping procedure with a resample of 5,000 as suggested by Hair *et al*. (2014). The result presented in Table 6 reveals that attitude ($\beta = 0.544$, p = 0.000), subjective norms ($\beta = 0.123$, p = 0.000), perceived behavioural control ($\beta = 0.237$, p = 0.000), and price

(β = 0.124, p = 0.000) were positively related to behaviour intention, thus providing support for H1, H3, H5, and H9. Also, subjective norms (β = 0.371, p = 0.000) and price (β = 0.471, p = 0.000) are found to be significantly associated with attitude which provide support for H2 and H8 (Table 5).

Table 5 - Direct Relationships Analysis

Hypotheses	Path	β	SE	t-value	p-value	f²	Decision
H1	A → BI	0.544	0.037	14.58	0.000	0.375	Supported
H2	SN → A	0.371	0.031	11.964	0.000	0.243	Supported
H3	SN → BI	0.123	0.032	3.827	0.000	0.027	Supported
H4	PBC → A	0.019	0.03	0.584	0.559	0.001	Not Supported
H5	PBC → BI	0.237	0.032	7.462	0.000	0.168	Supported
H6	Q → A	0.060	0.035	1.723	0.085	0.007	Not Supported
H7	Q → BI	0.009	0.034	0.16	0.873	0	Not Supported
H8	P → A	0.477	0.036	13.252	0.000	0.337	Supported
H9	P → BI	0.124	0.035	3.618	0.000	0.022	Supported
H10	EC → A	0.028	0.029	0.91	0.363	0.002	Not Supported
H11	EC → BI	-0.018	0.026	0.709	0.478	0.001	Not Supported

Source: Prepared by the authors (2023)

To examine the mediation effect of attitude, this study bootstraps the indirect effect as suggested by Preacher and Hayes (2004, 2008). This method can produce the indirect effect of constructs' path correlation (β) against the standard error and can be used to test the mediating effect. Moreover, Hair *et al*. (2011) state that a significant mediating effect is present when the upper level (UL) and lower level (LL) value show no zero straddle in between. All coefficient values concerning the mediating effect analysis are tabulated in Table 6 (indirect effect, standard error and t-values).

The results found that Attitude partially mediates the relationship between subjective norms and behaviour intention (β = 0.202, LL = 0.1716 and UL = 0.2042) and the relationship between perception of price and behaviour intention (β = 0.260, LL = 0.219 and UL = 0.309). Therefore, H12 and H15 are supported.

Table 6 - Indirect Relationships Analysis

Hypotheses	Path	Indirect Effect	SE	t-value	LL	UL	Decision
H12	SN → A → BI	0.202	0.021	9.592	0.171	0.242	Supported
H13	PBC → A → BI	0.010	0.016	0.590	-0.017	0.035	Not Supported
H14	Q → A → BI	0.033	0.019	1.681	0.002	0.066	Not Supported
H15	P → A → BI	0.260	0.027	9.664	0.219	0.309	Supported
H16	EC → A → BI	0.015	0.016	0.907	-0.012	0.04	Not Supported

Source: Prepared by the authors (2023)

CONCLUSION

Study on consumer's behaviour intention of remanufactured automotive parts is very limited. Therefore, this study aims to explore the influence of perception of quality, perception of price, environmental consciousness, attitude, subjective norms, perceived behavioural control on behaviour intention to purchase remanufactured automotive components in Malaysia context. It also discussed the mediating role of attitude. A research model based on the TPB was developed and then extended to include perception of quality, perception of price and environmental consciousness. The results of this study provide support for some of the developed hypotheses.

The results of this research revealed that attitude, subjective norms and perceived behavioural control positively affects behaviour intention. These results are in line with Ajzen (1991), James *et al*. (2019) and Saleki, Quoquab and Mohammad (2019) who reported that attitude, subjective norms and perceived behavioural control could significantly influence individual's intention to perform a particular behaviour. The results were also supported by the recent findings (see Rezai *et al*., 2017; Yadav and Pathak, 2017; Yadav, 2016) who found that consumer's attitude, subjective norms and perceived behavioural control all had a positive influence on their purchase intention.

In this study, among the six predictors studied, attitude was the strongest predictor for behaviour intention. This result was in line with Ajzen's (2015) results that found attitude was the strongest predictor of different food consumption intentions and consistent with the result from Saleki, Quoquab and Mohammad (2019) which reported that attitude was the strongest predictor for organic food purchase intention. The findings also suggest that perception of price has a positive effect on behaviour intention to purchase remanufactured automotive components. This result is in agreement with previous studies which found that price perception was a good predictor of intention (see Abbey *et al*., 2015; Jiménez-Parra *et al*., 2014; Wang *et al*., 2018).

During the decision-making process of purchasing remanufactured automotive components vs OEM components, consumers took into consideration various factors including the possible impacts remanufactured automotive parts could have on their safety, cost and on the environment welfare. This finding suggests the importance of the role of price perception in determining a consumer's behaviour intention to purchase remanufactured automotive parts in developing countries like Malaysia.

The developing countries such as Malaysia are typically prevalent to have consumers who place a greater emphasis on price than on the environment. These situations happened due to several factors contributed to it such as willing to purchase and exposure on the eco-friendly benefits. These circumstances occurred as a result of a number of factors, including consumer willingness to spend money and the exposure towards the advantages of purchasing environmentally friendly products.

Nevertheless, due to the increased of consumers' environmental consciousness, the environmentally friendly products are now broadly considered and accepted by Malaysian consumer. This study concludes that there are two types of consumers in the Malaysian market: those who are price-conscious and those who are environmentally conscious. These consumers prefer products that are both affordable and environmentally friendly. Despite the fact that environmental consciousness factor is not statistically significant in this study, there are small consumers who prefer to purchase greener products. These small consumers should be considered by the remanufacturer and manufacturer.

The findings of the research suggest that perception of price is worth to be incorporated into the TBP model for predicting Malaysian consumers' behaviour intention to purchase remanufactured automotive components. In addition, the results of this study found support for the mediating effect of attitude in the relationship between subjective norms, perception of price with behaviour intention. This result is consistent with the study of Indriani, Rahayu and Hadiwidjoyo (2019) and Lim *et al*. (2017) which suggests that attitude plays a vital role as a mediator.

According to the findings of this research, there multiple approaches that can be conducted in order to promote the remanufacturing business in Malaysia. Malaysian government is recommended to encourage the development of trade associated to remanufactured products especially in the automotive industry. Furthermore, a comprehensive roadmap should be developed by the Malaysian government to stimulate the growth of the remanufacturing sector. The roadmap should include gathering industry data on remanufacturing, which is currently inadequate and encourages discussion between players and policymakers to further enhance the respective trade policy. In addition, the roadmap should also include infrastructure development, and incentives to encourage the establishment of remanufacturing facilities.

This research would recommend the Malaysian government to launch the Research and Development (R&D). This programme can help improve the efficiency and effectiveness of

remanufacturing process, as well as the quality of remanufactured parts. The Government should also encourage the development of R&D initiatives to support the growth of the remanufacturing businesses. Besides, the remanufacturers should also collaborate with other stakeholders such as original equipment manufacturers (OEMs), remanufacturer from different industries and government agencies during the R&D programme. With this collaboration the remanufacturer able to increase the technical knowledge as well as expanding the sustainable supply chain for remanufactured automotive parts.

The R&D programme should also provide technical assistance. These technical assistance initiatives able to provide remanufacturers with access to training, tools and resources needed to improve their operations. In many cases, these initiatives can assist businesses in establishing and growing their remanufacturing operations. Moreover, the Government should introduce a certification system for remanufacturing industry. The establishment of certification system this industry, able to ensure the quality of remanufactured parts meet the similar quality standards as the OEM parts. Remanufacturer can adapt the quality standards to create benchmarks or targets to be achieved before releasing the products to the market. Therefore, will boost the consumer perception on quality of remanufactured parts.

By raising awareness and educating consumers on the benefits of remanufactured automotive parts are also substantial in developing the remanufacturing industry. In order to promote remanufacturing, awareness campaigns should highlight the environmental benefits and the potential cost savings that can be achieved by using remanufactured parts. As shown in the research results, Malaysia consumers are yet to consider the factor of environmental benefits as the value added to purchase the remanufactured automotive parts. Therefore, the Government should promote the circular economy and recycling programmes. As a result of these approaches, Malaysia able to reduce the amount of waste effect as well as sustaining the growth of remanufacturing industry.

Finally, this research proposed the Malaysia government to establish incentives for business owners and consumers which are using the remanufactured parts. For instances, the government can provide tax relief package for the consumers and subsidies to business owners that purchase remanufactured parts. Consequently, these initiatives able to reduce the cost associated with the use of remanufactured parts, as well as encourage consumers and business owners to purchase the remanufactured parts.

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