

MINISTRY OF EDUCATION AND TRAINING
NATIONAL ECONOMICS UNIVERSITY

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**CONSUMER BEHAVIORAL INTENTION
IN THE CIRCULAR ECONOMY: A STUDY
OF SMARTPHONES IN VIETNAM**

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CHAPTER 1:

INTRODUCTION TO THE RESEARCH

1. Rationale for the research

Electronic waste is increasing rapidly worldwide and in Vietnam, largely due to rising electronic consumption, short product lifecycles, technological obsolescence, and consumers' tendency to replace rather than repair devices. Smartphones are a major contributor because they are widely used and frequently replaced (Company, January 2026; Choudhary et al., 2025; Gadipelli, 2025; Quinto et al., 2025; Vietnam Electronic Waste Market Report and Forecast 2025-2034, Jul 29, 2025).

The circular economy provides a relevant framework for reducing smartphone-related e-waste by extending product lifespans and improving resource efficiency. In Vietnam, electronics are considered an important sector for circular transformation, and the 10R framework supports strategies such as reduce, reuse, repair, refurbish, and remanufacture (UNDP, December 17, 2025; Malooly and Daphne, November 9, 2023).

Refurbished smartphones are a practical circular-economy solution because they restore used devices for resale, reduce e-waste, and lower demand for new raw materials (Prabhu N and Majhi, 2023; Oraee et al., 2024). However, consumer acceptance remains uncertain due to concerns about reliability, prior use, warranty, and seller credibility (Agostini et al., 2021; Sharifi and Shokouhyar, 2021; Alyahya et al., 2023).

This study examines how environmental awareness, environmental concern, social influence, and consumer preference affect purchase intention toward refurbished smartphones in Vietnam. It also tests the moderating roles of trust in the refurbished product and trust in the retailer, while controlling for gender, demographic characteristics, and education level (Mayer, Davis and Schoorman, 1995; McKnight, Choudhury and Kacmar, 2002; Pavlou, 2003; Rahimah et al., 2018; Sun, Li and Wang, 2022; Lavuri et al., 2023).

1.2. Research objectives

The study focuses on the following objectives:

- To identify the key factors that contribute to consumers' awareness and perceptions of refurbished smartphones in Vietnam.
- To examine how environmental considerations and social influences affect consumers' purchase intention toward refurbished smartphones.
- To explore the role of trust, particularly trust in sellers and trust in product quality, in influencing purchase intention.
- To analyze how consumer preferences are formed and how they contribute to purchase intention toward refurbished smartphones.
- To examine whether consumers' purchase intention toward refurbished smartphones in Vietnam differs across gender groups, location groups, and completed education levels.
- To examine whether the structural relationships among environmental awareness, environmental concern, social influence, consumer preference, and purchase intention toward refurbished smartphones differ between male and female consumers in Vietnam.

Based on these findings, the thesis aims to propose managerial implications to enhance the adoption of refurbished smartphones and promote sustainable consumption in Vietnam.

1.3. Research questions

Based on the above objectives, the study addresses the following research questions:

- How do environmental awareness, environmental concern, and social influence shape consumer preference toward refurbished smartphones in Vietnam?
- To what extent do environmental awareness, environmental concern, and social influence contribute to the development of purchase intention through consumer preference?
- How do trust in refurbished smartphone retailers and trust in refurbished smartphones moderate the relationships between environmental awareness (EA), environmental concern, social influence, and consumer preference?
- How is consumer preference formed, and how does it influence purchase intention toward refurbished smartphones?
- How do consumers evaluate refurbished smartphones under conditions of uncertainty and information asymmetry, particularly regarding product quality and retailer reliability?
- Does consumers' purchase intention toward refurbished smartphones in Vietnam differ significantly across gender groups, location groups, and completed education levels?
- Do the structural relationships among environmental awareness, environmental concern, social influence, consumer preference, and purchase intention toward refurbished smartphones differ between male and female consumers in Vietnam?

1.4. Research scope

1.4.1. Content scope

The research examines consumer intention to purchase refurbished smartphones within the broader context of Vietnam's circular economy development. In particular, the study investigates:

- the direct effects of psychoenvironmental dimensions, namely environmental awareness and environmental concern, together with social influences, on the formation of consumer preferences and purchase intentions regarding refurbished smartphones;
- the moderating function of trust constructs, specifically trust in the seller and trust in the refurbished product, in shaping the relationships between psychoenvironmental conditions, social influences, and consumer behavioral responses;
- the mediating role of consumer preference as an underlying mechanism through which psychoenvironmental and social influences are translated into purchase intentions;
- consumer evaluations of perceived value and product quality under conditions characterized by information asymmetry associated with refurbishment processes;
- variations across consumer segments, with particular attention to gender based differences in the development of preferences and intentions to purchase refurbished smartphones.

1.4.2. Spatial and temporal scope

The study is situated within the Vietnamese market. This context represents an emerging economy shaped by collectivist cultural orientations that may influence environmentally responsible consumption behavior. The research was conducted over 2 months. Primary data collection took place between May and July 2025, capturing consumer perceptions and behavioral intentions towards refurbished smartphones within the contemporary market environment.

1.5. Research method

This study adopts a quantitative approach, using a structured survey, to examine consumer purchase intention for refurbished smartphones. Data were collected from Vietnamese consumers via a questionnaire based on established scales, measured on a five-point Likert scale, and responses were screened to ensure data quality. For analysis, SPSS was employed to conduct reliability testing, confirmatory factor analysis, and regression analysis. Mediation and moderation analyses were

subsequently applied to evaluate the roles of consumer preference and trust, thereby ensuring a rigorous examination of the relationships within the research model.

1.6. Structure of the dissertation

The thesis is structured into five chapters with the following specific content:

- Chapter 1: Introduction to the research
- Chapter 2: Theoretical foundations and literature review
- Chapter 3: Research methods
- Chapter 4: Results of research
- Chapter 5: Discussion and Implications

CHAPTER 2:

THEORETICAL FOUNDATIONS AND LITERATURE REVIEW

2.1. Literature review

This study examines circular consumption intention and consumer behavior toward refurbished smartphones as a specific context of e-waste, providing a focused setting for analysis (Borthakur & Govind, 2017; Forti et al., 2020). A systematic literature review is conducted using the TCCM framework to identify key theories, contexts, variables, and methods, while PRISMA guidelines ensure a transparent selection process of 50 peer-reviewed studies (Snyder, 2019; Paul & Criado, 2020; Page et al., 2021).

2.1.1. Theoretical perspectives on consumer behavioral intention in the circular economy

Research on refurbished products and sustainable consumption draws on diverse theoretical frameworks to explain consumer behavior, particularly through constructs such as intention, trust, and perceived risk. These studies also situate refurbished consumption within broader frameworks such as the circular economy and technology acceptance, highlighting the complexity of decision-making in this context.

Table 2.1: Principal theoretical frameworks in the examination of customer behavior with circular economy items

Theory Group (primary stream)	Theoretical focus	References (No.)
Theory of Planned Behavior (TPB)	This study path emphasizes the analysis of behavioral intentions, with purchase intention recognized as the predominant variable, while elucidating the process of intention creation grounded in the theoretical framework of attitudes, subjective norms, and perceived behavioral control. Consequently, numerous studies have augmented the Theory of Planned Behavior by incorporating concepts pertinent to circular or sustainable consumption, alongside factors such as perceived risk, beliefs, social influence, and environmental concerns, to more comprehensively capture the nuances of refurbished and sustainable consumption.	(Khor and Hazen, 2017), (Güngördü Bebağ and Bebağ, 2025), (Sharifi and Shokouhyar, 2021), (Zhang and Luo, 2021), (Singhal, Tripathy and Jens, 2019), (Abbasi et al., 2022), (Wang et al., 2018), (Bandara and Ariyaratne, 2024), (Parajuly et al., 2020), (Harms and Linton, 2016), (Keong, Kumar and Abbasi, 2020), (Phantratanamongkol et al., 2018), (Ibrahim et al., 2025), (Bandara and Ariyaratne, 2024), (Ballerini et al., 2025), (Fu et al., 2024)
Signaling-trust-perceived risk (information asymmetry) stream	Research adopting this methodology arises from the issue of information asymmetry between vendors and consumers, hence highlighting the significance of product quality indicators. These indicators may encompass warranty policies, certifications, supplier repute, or associated policy commitments. These qualities are believed to enhance trust, diminish perceived risk, and thus affect consumer intentions, decisions, or willingness to pay.	(Mugge, Jockin and Bocken, 2017), (Michaud and Llerena, 2011), (Abbey et al., 2015b), (Barkhi et al., 2024), (Khan, Tabish and Yu, 2025), (Agostini et al., 2021), (Van Weelden, Mugge and Bakker, 2016), (Navari and Shokouhyar, 2021), (Hazen et al., 2017), (Wang, 2021), (Mahmood and Heydari, 2021), (Sharifi & Shokouhyar, 2021), (Wang and Hazen, 2016), (Clemm et al., 2025), (Harms and Linton, 2016)
Circular economy / circular business models stream	This study is grounded in the circular economy framework, in which customer approval is seen as essential to the proper functioning and advancement of circular business models. This group's efforts primarily focus on implementing circular practices, prolonging product lifecycles, and transitioning consumer behavior from conventional ownership models to service access within a circular ecosystem.	(Elzinga et al., 2020), (Kerber, Fettermann and Bouzon, 2024), (Chun et al., 2022), (Baczys et al., 2024), (Kerber, Fettermann and Bouzon, 2024), (Koide et al., 2025)

Technology Acceptance Model (TAM)	This group examines refurbished things, especially technology items, through the lens of technology acceptance models. The analysis emphasizes not only customer acceptance of the product but also elucidates the mechanisms that shape acceptance behavior, integrating elements such as perceived risk and beliefs to more precisely represent the environment of refurbished products.	(Walther et al., 2024), (Walther et al., 2022), (Walther, Magnier and Mugge, 2023), (Mugge et al., 2018)
Norm-Based Theories	Value-Belief-Norm (VBN) Theory explains behavior as the outcome of a psychological chain that begins with individual values. These values shape beliefs about environmental consequences, which in turn influence a sense of moral obligation. When individuals feel personally responsible, they are more likely to engage in pro-social or environmentally responsible actions, such as choosing sustainable products. Norm Activation Model (NAM) focuses more narrowly on how personal norms are triggered. It suggests that behavior arises when individuals become aware of the negative consequences of their actions and accept responsibility for them. This process activates an internal sense of duty, which then guides behavior in a more ethical or socially responsible direction.	(Abbey et al., 2015a), (Gaur et al., 2015), (Hazen, Mollenkopf and Wang, 2017), (Lee and Kwak, 2020), (Hazen et al., 2012), (Zhang, Wang and Gao, 2025), (Dong et al., 2025), (Abdulla et al., 2024), (Anurad and Spers, 2022)

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2.1.2. Research contexts in circular economy consumer behavioral intention in the circular economy

Research on refurbished products varies across product types, channels, and regions, with smartphones often highlighted due to trust and risk concerns. These differences suggest that consumer behavior is context-dependent and remains unevenly explored across markets.

Table 2.2: Contextual dimensions of consumer research on circular e-waste products

Context dimension	Context group	Brief description	References (No.)
Product domain	Refurbished smartphones	Core research context. Smartphones are highly personalized technology products, and quality risk and consumer trust play central roles in shaping acceptance and purchase outcomes.	(Mugge, Jockin and Bocken, 2017), (Güngördü Bebağ and Bebağ, 2025), (Sharifi and Shokouhyar, 2021), (Kerber, Fettermann and Bouzon, 2024), (Agostini et al., 2021), (Singhal, Tripathy and Jens, 2019), (Chun et al., 2022), (Bandara and Ariyaratne, 2024), (Van Weelden, Mugge and Bakker, 2016), (Mugge et al., 2018), (Navari and Shokouhyar, 2021), (Phantratanamongkol et al., 2018), (Kerber, Fettermann and Bouzon, 2024), (Ibrahim et al., 2025), (Bandara and Ariyaratne, 2024)
	Other electronic products	Electronic products beyond smartphones, commonly used to test risk-trust-value mechanisms in refurbished or remanufactured settings.	(Gaur et al., 2015), (Khor and Hazen, 2017), (Hazen, Mollenkopf and Wang, 2017), (Walther et al., 2024), (Barkhi et al., 2024), (Walther, Magnier and Mugge, 2023), (Lee and Kwak, 2020), (Hazen et al., 2012), (Baczys et al., 2024), (Parajuly et al., 2020), (Dong et al., 2025), (Hazen et al., 2017), (Keong, Kumar and Abbasi, 2020), (Clemm et al., 2025)
	Remanufactured/circular products (general)	Refurbished and circular products in general, with a strong emphasis on consumer acceptance and willingness to pay.	(Michaud and Llerena, 2011), (Abbey et al., 2015b), (Walther et al., 2022), (Khan, Tabish and Yu, 2025), (Zhang and Luo, 2021), (Abbasi et al., 2022), (Wang et al., 2018), (Zhang, Wang and Gao, 2025), (Mahmood and Heydari, 2021), (Harms and Linton, 2016), (Abdulla et al., 2024), (Wang and Hazen, 2016), (Anurad and Spers, 2022), (Harms and Linton, 2016), (Koide et al., 2025), (Ballerini et al., 2025), (Fu et al., 2024)
Market/channel	Online platforms/e-commerce	Digital market environments are characterized by high information asymmetry and a firm's reliance on quality and trust-related signals.	(Elzinga et al., 2020), (Mugge, Jockin and Bocken, 2017), (Hazen, Mollenkopf and Wang, 2017), (Sharifi and Shokouhyar, 2021), (Walther et al., 2024), (Barkhi et al., 2024), (Walther et al., 2022), (Walther, Magnier and Mugge, 2022), (Khan, Tabish and Yu, 2025), (Singhal, Tripathy and Jens, 2019), (Chun et al., 2022), (Mugge et al., 2018), (Zhang, Wang and Gao, 2025), (Wang, 2021), (Abdulla et al., 2024), (Phantratanamongkol et al., 2018), (Ibrahim et al., 2025), (Clemm et al., 2025), (Anurad and Spers, 2022), (Bandara and Ariyaratne, 2024), (Koide et al., 2025)
	Circular systems / closed-loop settings	System-level contexts that link demand-side consumer acceptance with supply-side circular design and operational decisions.	(Güngördü Bebağ and Bebağ, 2025), (Agostini et al., 2021), (Abbasi et al., 2022), (Wang et al., 2018), (Bandara and Ariyaratne, 2024), (Lee and Kwak, 2020), (Hazen et al., 2012), (Baczys et al., 2024), (Parajuly et al., 2020), (Hazen et al., 2017), (Harms and Linton, 2016), (Sharifi and Shokouhyar, 2021), (Keong, Kumar and Abbasi, 2020), (Fu et al., 2024)
Geographic scope	Europe / North America	Western contexts, primarily European countries and the United States.	(Elzinga et al., 2020), (Mugge, Jockin and Bocken, 2017), (Abbey et al., 2015a), (Gaur et al., 2015), (Hazen, Mollenkopf and Wang, 2017), (Walther et al.,

		2022), (Hazen <i>et al.</i> , 2012), (Mugge <i>et al.</i> , 2018), (Zhang, Wang and Gao, 2025), (Parajuly <i>et al.</i> , 2020), (Hazen <i>et al.</i> , 2017), (Harms and Lanton, 2016), (Phantratanamongkol <i>et al.</i> , 2018), (Harms and Lanton, 2016), (Ballerini <i>et al.</i> , 2025)
Asia	Asian contexts, including China, Malaysia, Japan, Korea, Taiwan, and India.	(Khor and Hazen, 2017), (Zhang and Luo, 2021), (Chun <i>et al.</i> , 2022), (Abbasi <i>et al.</i> , 2022), (Wang <i>et al.</i> , 2018), (Lee and Kwak, 2020), (Hazen <i>et al.</i> , 2017), (Wang, 2021), (Keong, Kumar and Abbasi, 2020), (Phantratanamongkol <i>et al.</i> , 2018), (Wang and Hazen, 2016), (Clemm <i>et al.</i> , 2025)
Others	Studies in which the geographic context is not explicitly specified.	(Michaud and Llerena, 2011), (Abbey <i>et al.</i> , 2015b), (Güngördü Bebağ and Bebağ, 2025), (Sharifi and Shokouhyar, 2021), (Walker <i>et al.</i> , 2024), (Burkhi <i>et al.</i> , 2024), (Walker, Mugnier and Mugge, 2022), (Khan, Tabish and Yu, 2025), (Kerber, Fettermann and Bouzon, 2024), (Agostini <i>et al.</i> , 2021), (Bandara and Ariyaratne, 2024), (Van Weelden, Mugge and Bakker, 2016), (Bączek <i>et al.</i> , 2024), (Nasiri and Shokouhyar, 2021), (Dong <i>et al.</i> , 2025), (Mahmoodi and Heydari, 2021), (Sharifi and Shokouhyar, 2021), (Abdulla <i>et al.</i> , 2024), (Kerber, Fettermann and Bouzon, 2024), (Ibrahim <i>et al.</i> , 2025), (Anaral and Spers, 2022), (Bandara and Ariyaratne, 2024), (Kosde <i>et al.</i> , 2025), (Fu <i>et al.</i> , 2024)

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2.1.3. Key characteristics of circular economy consumer behavioral intention in the circular economy

Contemporary studies on refurbished products employ a wide range of variables, focusing on outcomes such as purchase intention and willingness to pay while examining underlying psychological mechanisms, including perceived risk and trust. These studies also emphasize mediating and moderating factors, indicating that consumer behavior is highly context-dependent and varies across market conditions and consumer segments.

Table 2. 1: Key variables and constructs in consumer research on circular products

Characteristic group	Key variables/constructs	Role in the research model	References (No.)
Outcome variables	Purchase intention	Core dependent variable reflecting consumers' propensity to accept and purchase refurbished products.	(Khor and Hazen, 2017), (Güngördü Bebağ and Bebağ, 2025), (Sharifi and Shokouhyar, 2021), (Zhang and Luo, 2021), (Chun <i>et al.</i> , 2022), (Abbasi <i>et al.</i> , 2022), (Wang <i>et al.</i> , 2018), (Bandara and Ariyaratne, 2024), (Zhang, Wang and Gao, 2025), (Wang, 2021), (Harms and Lanton, 2016), (Keong, Kumar and Abbasi, 2020), (Kerber, Fettermann and Bouzon, 2024), (Bandara and Ariyaratne, 2024), (Ballerini <i>et al.</i> , 2025), (Fu <i>et al.</i> , 2024)
	Consumer choice	Behavioral or choice-based outcome examined in experimental or simulated decision contexts.	(Elzinga <i>et al.</i> , 2020), (Michaud and Llerena, 2011), (Abbey <i>et al.</i> , 2015b), (Abbey <i>et al.</i> , 2015a), (Van Weelden, Mugge and Bakker, 2016), (Parajuly <i>et al.</i> , 2020), (Dong <i>et al.</i> , 2025), (Mahmoodi and Heydari, 2021), (Sharifi and Shokouhyar, 2021), (Phantratanamongkol <i>et al.</i> , 2018), (Ibrahim <i>et al.</i> , 2025)
	Willingness to pay	Economic outcome variable capturing consumers' willingness to pay for refurbished products.	(Michaud and Llerena, 2011), (Burkhi <i>et al.</i> , 2024), (Khan, Tabish and Yu, 2025), (Van Weelden, Mugge and Bakker, 2016), (Dong <i>et al.</i> , 2025), (Mahmoodi and Heydari, 2021), (Sharifi and Shokouhyar, 2021), (Phantratanamongkol <i>et al.</i> , 2018), (Ibrahim <i>et al.</i> , 2025), (Harms and Lanton, 2016), (Fu <i>et al.</i> , 2024)
Value-based drivers	Perceived value	Primary motivational driver, typically exerting direct or indirect effects on intention and willingness to pay.	(Mugge, Jockin and Becken, 2017), (Gaur <i>et al.</i> , 2015), (Burkhi <i>et al.</i> , 2024), (Agostini <i>et al.</i> , 2021), (Zhang and Luo, 2021), (Van Weelden, Mugge and Bakker, 2016), (Hazen <i>et al.</i> , 2012), (Dong <i>et al.</i> , 2025), (Mahmoodi and Heydari, 2021), (Sharifi and Shokouhyar, 2021), (Ballerini <i>et al.</i> , 2025)
	Economic benefit/price advantage	Perceived economic gains are often evaluated relative to new products.	(Michaud and Llerena, 2011), (Gaur <i>et al.</i> , 2015), (Khan, Tabish and Yu, 2025), (Hazen <i>et al.</i> , 2012), (Dong <i>et al.</i> , 2025), (Mahmoodi and Heydari, 2021), (Sharifi and Shokouhyar, 2021), (Phantratanamongkol <i>et al.</i> , 2018), (Ibrahim <i>et al.</i> , 2025)
	Environmental value/sustainability value	Environment-related value perceptions linked to circular and sustainable consumption.	(Elzinga <i>et al.</i> , 2020), (Sharifi and Shokouhyar, 2021), (Zhang and Luo, 2021), (Wang <i>et al.</i> , 2018), (Van Weelden, Mugge and Bakker, 2016), (Kerber, Fettermann and Bouzon, 2024), (Ballerini <i>et al.</i> , 2025)
Core mechanisms	Perceived risk (quality, performance, privacy)	Inhibiting mechanism that exerts direct adverse or moderating effects within the model.	(Mugge, Jockin and Becken, 2017), (Burkhi <i>et al.</i> , 2024), (Khan, Tabish and Yu, 2025), (Kerber, Fettermann and Bouzon, 2024), (Agostini <i>et al.</i> , 2021), (Nasiri and Shokouhyar, 2021), (Hazen <i>et al.</i> , 2017), (Abdulla <i>et al.</i> , 2024), (Wang and Hazen, 2016), (Anaral and Spers, 2022), (Fu <i>et al.</i> , 2024)
	Trust (seller, platform, product)	Central mediating mechanism that reduces perceived risk and enhances intention and willingness to pay.	(Hazen, Möllerkopf and Wang, 2017), (Walker <i>et al.</i> , 2024), (Singhal, Tripathy and Jena, 2019), (Abbasi <i>et al.</i> , 2022), (Bandara and Ariyaratne, 2024), (Lee and Kwak, 2020), (Bączek <i>et al.</i> , 2024), (Mugge <i>et al.</i> , 2018), (Harms and Lanton, 2016), (Kerber, Fettermann and Bouzon, 2024), (Bandara and Ariyaratne, 2024)

Signaling variables	Warranty/certification	Quality-related signals that mitigate information asymmetry in refurbished product markets.	(Mugge, Jockin and Becken, 2017), (Van Weelden, Mugge and Bakker, 2016), (Lee and Kwak, 2020), (Mahmoodi and Heydari, 2021), (Harms and Lanton, 2016)
	Seller reputation/platform credibility	Trust-related signals that are particularly salient in online and platform-based contexts.	(Hazen, Möllerkopf and Wang, 2017), (Singhal, Tripathy and Jena, 2019), (Abbasi <i>et al.</i> , 2022), (Bączek <i>et al.</i> , 2024), (Mugge <i>et al.</i> , 2018), (Hazen <i>et al.</i> , 2017), (Harms and Lanton, 2016), (Wang and Hazen, 2016)
Behavioral and psychological factors	Attitude	Core TPB component with a direct influence on behavioral intention.	(Khor and Hazen, 2017), (Güngördü Bebağ and Bebağ, 2025), (Chun <i>et al.</i> , 2022), (Zhang, Wang and Gao, 2025), (Wang, 2021), (Keong, Kumar and Abbasi, 2020), (Ballerini <i>et al.</i> , 2025)
	Social norms / social influence	Normative pressure often operates as a moderating or contextual factor.	(Khor and Hazen, 2017), (Sharifi and Shokouhyar, 2021), (Chun <i>et al.</i> , 2022), (Wang <i>et al.</i> , 2018), (Zhang, Wang and Gao, 2025), (Keong, Kumar and Abbasi, 2020), (Clemm <i>et al.</i> , 2025)
	Environmental concern	A boundary condition that strengthens the effect of environmental value on outcome variables.	(Zhang and Luo, 2021), (Wang <i>et al.</i> , 2018), (Keong, Kumar and Abbasi, 2020), (Ballerini <i>et al.</i> , 2025), (Fu <i>et al.</i> , 2024)
Moderators/boundary conditions	Consumer experience	Moderates the relationships between perceived risk, trust, and behavioral intention.	(Walker, Mugnier and Mugge, 2022), (Hazen <i>et al.</i> , 2012), (Zhang, Wang and Gao, 2025), (Wang, 2021), (Harms and Lanton, 2016)
	Price sensitivity	Moderates the impact of value perceptions on willingness to pay and intention.	(Khan, Tabish and Yu, 2025), (Hazen <i>et al.</i> , 2012), (Dong <i>et al.</i> , 2025), (Mahmoodi and Heydari, 2021), (Sharifi and Shokouhyar, 2021)
	Product condition/grading	Boundary condition influencing trust formation and perceived risk.	(Kerber, Fettermann and Bouzon, 2024), (Lee and Kwak, 2020), (Nasiri and Shokouhyar, 2021), (Abdulla <i>et al.</i> , 2024), (Harms and Lanton, 2016)

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2.1.4. Research methods in circular economy consumer behavioral intention in the circular economy

Research on consumer behavior toward circular-economy products is predominantly quantitative, relying on cross-sectional surveys and online questionnaires to examine attitudes, perceived value, and purchase intentions. Common analytical approaches include regression, confirmatory factor analysis, and structural equation modeling, with some studies adopting multi-method designs to enhance reliability and theoretical insight.

Table 2. 2: Approaches to studying consumer behavior and analysis in the context of circular products

Characteristic group	Key methods/techniques	Role in the research	References (No.)
Quantitative survey methods	Cross-sectional survey	Dominant empirical approach for testing models of attitudes, perceived value, and purchase intention.	(Mugge, Jockin and Becken, 2017), (Gaur <i>et al.</i> , 2015), (Khor and Hazen, 2017), (Güngördü Bebağ and Bebağ, 2025), (Sharifi and Shokouhyar, 2021), (Burkhi <i>et al.</i> , 2024), (Agostini <i>et al.</i> , 2021), (Zhang and Luo, 2021), (Chun <i>et al.</i> , 2022), (Abbasi <i>et al.</i> , 2022), (Wang <i>et al.</i> , 2018), (Bandara and Ariyaratne, 2024), (Hazen <i>et al.</i> , 2012), (Zhang, Wang and Gao, 2025), (Wang, 2021), (Harms and Lanton, 2016), (Keong, Kumar and Abbasi, 2020), (Kerber, Fettermann and Bouzon, 2024), (Bandara and Ariyaratne, 2024), (Ballerini <i>et al.</i> , 2025), (Fu <i>et al.</i> , 2024)
	Online questionnaire	Primary data collection instrument, well-suited to the refurbished product context.	(Mugge, Jockin and Becken, 2017), (Gaur <i>et al.</i> , 2015), (Khor and Hazen, 2017), (Güngördü Bebağ and Bebağ, 2025), (Sharifi and Shokouhyar, 2021), (Burkhi <i>et al.</i> , 2024), (Khan, Tabish and Yu, 2025), (Zhang and Luo, 2021), (Chun <i>et al.</i> , 2022), (Abbasi <i>et al.</i> , 2022), (Wang <i>et al.</i> , 2018), (Bandara and Ariyaratne, 2024), (Hazen <i>et al.</i> , 2012), (Zhang, Wang and Gao, 2025), (Wang, 2021), (Harms and Lanton, 2016), (Keong, Kumar and Abbasi, 2020), (Kerber, Fettermann and Bouzon, 2024), (Bandara and Ariyaratne, 2024), (Ballerini <i>et al.</i> , 2025), (Fu <i>et al.</i> , 2024)
Experimental methods	Scenario-based experiment	Measures consumer choice, willingness to pay, and responses to signals such as price, warranty, and eco-labels.	(Elzinga <i>et al.</i> , 2020), (Michaud and Llerena, 2011), (Abbey <i>et al.</i> , 2015b), (Abbey <i>et al.</i> , 2015a), (Van Weelden, Mugge and Bakker, 2016), (Parajuly <i>et al.</i> , 2020), (Dong <i>et al.</i> , 2025), (Mahmoodi and Heydari, 2021), (Sharifi and Shokouhyar, 2021), (Phantratanamongkol <i>et al.</i> , 2018), (Ibrahim <i>et al.</i> , 2025), (Harms and Lanton, 2016)
	Between-subjects design	Enables control of independent variables and reduces cognitive and demand biases.	(Elzinga <i>et al.</i> , 2020), (Michaud and Llerena, 2011), (Abbey <i>et al.</i> , 2015b), (Abbey <i>et al.</i> , 2015a), (Van Weelden,

			Mugge and Bakker, 2016), (Parajuly <i>et al.</i> , 2020), (Dong <i>et al.</i> , 2025), (Mahmoodi and Heydari, 2021), (Sharifi and Shokouhyar, 2021), (Phantratanamongkol <i>et al.</i> , 2018), (Ibrahim <i>et al.</i> , 2025).
Choice-based methods	Discrete Choice Experiment (DCE)	Examines choice behavior and trade-offs among product attributes.	(Michaud and Llerena, 2011), (Van Weelden, Mugge and Bakker, 2016), (Dong <i>et al.</i> , 2025), (Mahmoodi and Heydari, 2021), (Sharifi and Shokouhyar, 2021), (Phantratanamongkol <i>et al.</i> , 2018), (Ibrahim <i>et al.</i> , 2025).
	Willingness-to-pay elicitation	Captures perceived economic value associated with refurbished products.	(Michaud and Llerena, 2011), (Barkhi <i>et al.</i> , 2024), (Khan, Tabish and Yu, 2025), (Van Weelden, Mugge and Bakker, 2016), (Dong <i>et al.</i> , 2025), (Mahmoodi and Heydari, 2021), (Sharifi and Shokouhyar, 2021), (Phantratanamongkol <i>et al.</i> , 2018), (Ibrahim <i>et al.</i> , 2025), (Harms and Linton, 2016), (Fu <i>et al.</i> , 2024).
Statistical and analytical techniques	Regression analysis	Tests direct relationships among key variables.	(Michaud and Llerena, 2011), (Gaur <i>et al.</i> , 2015), (Barkhi <i>et al.</i> , 2024), (Khan, Tabish and Yu, 2025), (Agostini <i>et al.</i> , 2021), (Hazen <i>et al.</i> , 2012), (Dong <i>et al.</i> , 2025), (Mahmoodi and Heydari, 2021), (Sharifi and Shokouhyar, 2021), (Phantratanamongkol <i>et al.</i> , 2018), (Ibrahim <i>et al.</i> , 2025).
	Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM)	Examines structural relationships, including mediating and moderating effects.	(Mugge, Jochen and Hecken, 2017), (Gaur <i>et al.</i> , 2015), (Khor and Hazen, 2017), (Güngörel Bektaş and Bektaş, 2025), (Sharifi and Shokouhyar, 2021), (Zhang and Luo, 2021), (Chen <i>et al.</i> , 2022), (Abbasi <i>et al.</i> , 2022), (Wang <i>et al.</i> , 2018), (Bandara Ariyaratne, 2024), (Hazen <i>et al.</i> , 2012), (Zhang, Wang and Gao, 2025), (Wang, 2021), (Harms and Linton, 2016), (Kong, Kumar and Abbasi, 2020), (Kerber, Fettermann and Bouzon, 2024), (Bandara Ariyaratne, 2024), (Ballerini <i>et al.</i> , 2025), (Fu <i>et al.</i> , 2024).
	Mediation/moderation analysis	Investigates trust-risk-value mechanisms and boundary conditions.	(Walther, Magnier and Mugge, 2022), (Khan, Tabish and Yu, 2025), (Zhang and Luo, 2021), (Wang <i>et al.</i> , 2018), (Hazen <i>et al.</i> , 2012), (Zhang, Wang and Gao, 2025), (Dong <i>et al.</i> , 2025), (Wang, 2021), (Mahmoodi and Heydari, 2021), (Sharifi and Shokouhyar, 2021), (Harms and Linton, 2016), (Ballerini <i>et al.</i> , 2025), (Fu <i>et al.</i> , 2024).
			(Walther, Magnier and Mugge, 2022), (Khan, Tabish and Yu, 2025), (Zhang and Luo, 2021), (Wang <i>et al.</i> , 2018), (Hazen <i>et al.</i> , 2012), (Zhang, Wang and Gao, 2025), (Dong <i>et al.</i> , 2025), (Wang, 2021), (Mahmoodi and Heydari, 2021), (Sharifi and Shokouhyar, 2021), (Harms and Linton, 2016), (Ballerini <i>et al.</i> , 2025), (Fu <i>et al.</i> , 2024).
Multi-method designs	Multi-study design	Enhances robustness and generalizability of findings across methods and samples.	(Van Weelden, Mugge and Bakker, 2016), (Dong <i>et al.</i> , 2025), (Mahmoodi and Heydari, 2021), (Sharifi and Shokouhyar, 2021), (Phantratanamongkol <i>et al.</i> , 2018), (Ibrahim <i>et al.</i> , 2025).
Review and conceptual methods	Systematic/narrative review	Synthesizes theoretical perspectives, empirical patterns, and research gaps.	(Hazen, Melkenhoff and Wang, 2017), (Walther <i>et al.</i> , 2024), (Kerber, Fettermann and Bouzon, 2024), (Singhal, Tripathy and Jena, 2019), (Lee and Kwak, 2020), (Baczyk <i>et al.</i> , 2024), (Mugge <i>et al.</i> , 2018), (Nasiri and Shokouhyar, 2021), (Hazen <i>et al.</i> , 2017), (Abdulla <i>et al.</i> , 2024), (Wang and Hazen, 2016), (Amari and Speer, 2022).

Source: Authors' own work

2.1.5. Research gaps

The circular economy and 10R framework support waste reduction through smarter resource use and product life extension, with refurbishment helping extend smartphone lifespans, reduce virgin material demand, save energy, and lower emissions (Potting *et al.*, 2017; Morseletto, 2020; MacArthur, 2013; Prabhu N and Majhi, 2023; Orace *et al.*, 2024). However, adoption of refurbished smartphones remains uncertain due to concerns about transparency, quality, reliability, warranty, and seller credibility (Chen and Chen, 2019; Sharifi and Shokouhyar, 2021; Alyahya *et al.*, 2023; Zheng, Wang and Park, 2024). Thus, this study examines the effects of environmental awareness, environmental concern, social influence, and consumer preference on purchase intention in Vietnam, while testing the moderating roles of trust in the refurbished product and retailer, and controlling for gender and demographic characteristics (Parajuly *et al.*, 2020; Bigliardi, Filippelli and Quinto, 2022; Mayer, Davis and Schoorman, 1995; Pavlou, 2003; Sun, Li and Wang, 2022; Lavuri *et al.*, 2023).

2.2. Theoretical foundations

2.2.1. Circular economy

The passage conceptualizes the circular economy as a systemic framework for redesigning production and consumption to prevent waste, reduce environmental impact, and retain resource value across economic cycles (Potting *et al.*, 2017; Reike *et al.*, 2018). Within this framework, the 10R hierarchy prioritizes upstream strategies such as rethink and reduce, followed by lifespan-extending practices including reuse, repair, and refurbishment, while recognizing recycling as a necessary but downstream approach (Malooly & Daphne, November 9, 2023).

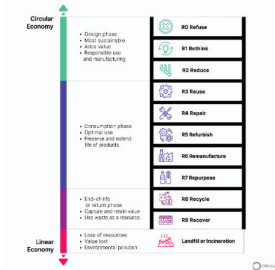


Figure 2.1: The 10R Hierarchy of Circular Economy Strategies and Resource Value Retention

Source: (Malooly & Daphne, November 9, 2023)

2.2.2. Consumer roles in the circular economy

The 10R model shows that circular economy strategies involve both technical product decisions and coordinated value flows among consumers, producers, and market actors across the product lifecycle (Malooly & Daphne, November 9, 2023; Reike *et al.*, 2018). In refurbishment, consumers initiate the loop by returning used products, producers or specialized firms restore functionality, and retailers or distribution platforms reintroduce the products to the market, thereby creating a closed and cyclical value system rather than a linear one (Malooly & Daphne, November 9, 2023; Reike *et al.*, 2018). The effectiveness of this cycle depends on consumer participation and trust, since consumers provide both the supply of used devices and the demand for refurbished products, while producers and market actors support value retention and circulation within the circular economy (Reike *et al.*, 2018).

2.2.3. Consumers' purchase intention

Purchase intention (PI) is conceptualized as a cognitive state reflecting an individual's readiness to act, serving as a key link between evaluation and behavior within the Theory of Planned Behavior (Ajzen, 1991; Abbasi *et al.*, 2022). It represents a transitional stage where internal assessments, influenced by both psychological and contextual factors, begin to translate into purchasing decisions. In digital contexts, purchase intention is increasingly shaped by trust, social interactions, and environmental considerations. Online environments and social cues influence decision-making through emotional engagement and perceived authenticity, while sustainability factors further enhance consumers' willingness to purchase (Saima & Khan, 2020; Wang *et al.*, 2022; Fu *et al.*, 2025).

2.2.4. Refurbished smartphone

Refurbished smartphones are positioned within the 10R framework as a value retention strategy (Refurbish – R5), involving inspection, repair, and component replacement to restore functionality and extend product lifespan (Reike et al., 2018; Alyahya et al., 2023). This process preserves both functional and economic value while improving reliability compared to direct reuse. Unlike reuse, which involves minimal intervention and depends on the product's existing condition, refurbishment enhances and standardizes performance, thereby reducing perceived risk and increasing consumer acceptance in circular economy practices (Prabhu & Majhi, 2023; Mugge et al., 2017).

2.3. Research model and hypotheses

2.3.1. Theoretical framework

Frameworks such as VBN, NAM, and TPB explain sustainable behavior through values, norms, and cognition, but are limited in refurbished product contexts due to uncertainty and information asymmetry (Ajzen, 1991; Stern, 2000). While VBN and NAM focus on internal motivations, they overlook trust and perceived risk, and TPB becomes less effective when trust outweighs social influence (Wang et al., 2018). This study extends TPB by introducing consumer preferences and dual trust (product and retailer) as moderating mechanisms to better explain purchase intention under uncertainty (Morgan & Hunt, 1994).

2.3.2. Research hypotheses

2.3.2.1. Environmental Awareness and Concern

Environmental awareness is the cognitive recognition of the environmental impacts of smartphone production, use, disposal, and replacement, while environmental concern reflects consumers' affective and evaluative response to these issues (Renn, 2011; Hannibal, Liu and Vedlitz, 2016; Dunlap and Jones, 2002). Prior studies show that both awareness and concern support sustainable consumption, green product choices, and intentions to purchase refurbished electronics (Wang et al., 2016; Gandhi, 2021; Herziger and Shmueli, 2024; Wallner et al., 2024). Based on the VBN and NAM frameworks, this study expects environmental awareness and environmental concern to shape consumer preference toward refurbished smartphones by helping consumers recognize and value the environmental benefits of product life extension (Stern, 2000; Lee, Kim and Roh, 2023; Majeed, Kim and Kim, 2023).

H1: Environmental awareness is positively associated with consumer preference in the context of refurbished smartphones.

H2: Environmental concern is positively associated with consumer preference in the context of refurbished smartphones.

2.3.2.2. Social Influence and Consumer Preference

Social influence affects consumer decisions through normative pressure and informational support, especially in uncertain contexts (Ajzen, 1991; Cruwys et al., 2015). In refurbished smartphone consumption, peer behavior and shared experiences reduce perceived risk and guide evaluation, leading to stronger preferences.

H3: Social influence is positively associated with consumer preference in the context of refurbished smartphones.

2.3.2.3. Consumer Preference on Purchase Intention

Consumer preference refers to consumers' comparative priority for refurbished smartphones over other smartphone options after evaluating functional, economic, and environmental attributes (Tversky, Slovic and Kahneman, 1990; Hsee, 1996; Huber, Ariely and Fischer, 2002). Unlike attitude, preference reflects product-level choice priority rather than a general

evaluation of buying behavior (Ajzen, 1991; Ajzen, 2006). In this study, preference is expected to strengthen purchase intention because it indicates that consumers regard refurbished smartphones as a viable and desirable alternative based on usability, reliability, affordability, and sustainability (Mehraj and Qureshi, 2022; Srivastava, Gupta and Rana, 2023; Alam et al., 2025a).

H4: Consumer preference has a positive influence on consumers' purchase intention toward refurbished smartphones.

2.3.2.4. Retailer Trust as a Moderating Factor

Environmental knowledge helps consumers understand the environmental problems, causes, consequences, and sustainable value of refurbishment, which may support more favorable preferences for refurbished smartphones (Zsóka et al., 2013; Joshi and Rahman, 2015; Yue et al., 2020). However, refurbished smartphones involve uncertainty about quality, prior use, performance, warranty, and reliability, making retailer trust important in reducing perceived risk and assuring consumers about inspection, disclosure, warranty, and after-sales support (Abbey et al., 2015b; Wang et al., 2018b; Morgan and Hunt, 1994; Gefen, Karahanna and Straub, 2003). Therefore, retailer trust is expected to strengthen the effects of environmental knowledge, environmental concern, and social influence on consumer preference by making refurbished smartphones appear both sustainable and practically reliable (Ajzen, 1991; Ismagilova et al., 2020; Bigliardi, Filippelli and Quinto, 2022).

H5a: Trust in the refurbished smartphone retailer positively moderates the effect of environmental awareness on consumer preference for refurbished smartphones.

H5b: Trust in the refurbished smartphone retailer positively moderates the effect of environmental concern on consumer preference for refurbished smartphones.

H5c: Trust in the refurbished smartphone retailer positively moderates the effect of social influence on consumer preference for refurbished smartphones.

2.3.2.5. Product Trust as a Moderating Factor

Trust in refurbished smartphone quality helps consumers connect environmental motivations with functional product evaluation. When consumers perceive refurbished devices as reliable and durable, they are more likely to view them as practical and credible alternatives, which reduces perceived risk and strengthens preference formation (McQueen et al., 2022; Herziger & Shmueli, 2024; Senali et al., 2024). Therefore, product trust can reinforce the effects of environmental awareness, environmental concern, and social influence on consumer preference toward refurbished smartphones (Wang et al., 2013; Senali et al., 2024).

H6a: Trust in the refurbished smartphone positively moderates the effect of environmental awareness on consumer preference.

H6b: Trust in the refurbished smartphone itself positively moderates the effect of environmental concern on consumer preference.

H6c: Trust in the refurbished smartphone itself positively moderates the effect of environmental concern on consumer preference.

2.3.2.6. Control variables and demographic differences in purchase intention

Rather than treating gender, location, and completed education level as main explanatory constructs, this study uses them as control variables because prior findings on demographic effects in green and sustainable purchase intention remain mixed and context dependent (Chekima et al., 2016; Rahimah et al., 2018; Sreen, Purbey and Sadarangani, 2018; Sun, Li and Wang, 2022; Meet, Kundu and Ahluwalia, 2024). In the Vietnamese context, consumer background conditions may still shape sustainable purchase intention, as income has been found to be positively associated with green apparel purchase intention among young Vietnamese consumers (Nguyen, Nguyen and Nguyen, 2019). Location may also reflect differences in market access, retail infrastructure, delivery services,

and exposure to refurbished or second-hand electronics, while education may influence consumers' ability to evaluate product information, warranty conditions, environmental claims, perceived value, and product risk (Mugge, Jockin and Bocken, 2017; Shao, Derudder and Witlox, 2022; Nasiri and Shokouhyar, 2021). Therefore, this study examines whether purchase intention toward refurbished smartphones differs significantly across selected demographic groups.

H7: Consumers' purchase intention toward refurbished smartphones in Vietnam differs significantly across gender groups.

H8: Consumers' purchase intention toward refurbished smartphones in Vietnam differs significantly across location groups.

H9: Consumers' purchase intention toward refurbished smartphones in Vietnam differs significantly across completed education levels.

2.3.2.7. Gender-based multi-group differences

Although gender is treated as a control variable, prior studies suggest that it may also explain differences in how consumers form green and sustainable purchase intentions. Gender differences have been observed in the roles of social influence, green attitudes, and other socio-demographic factors in shaping sustainable consumption decisions (Islam, Thomas and Albishri, 2024; Olfat, 2025; Meet, Kundu and Ahluwalia, 2024). In the context of refurbished smartphones, such differences may also relate to how consumers evaluate perceived value, risk, product information, and satisfaction (Nasiri and Shokouhyar, 2021). Therefore, this study further examines whether the structural relationships among environmental awareness, environmental concern, social influence, consumer preference, and purchase intention differ between male and female consumers.

H10: The structural relationships among environmental awareness, environmental concern, social influence, consumer preference, and purchase intention toward refurbished smartphones differ significantly between male and female consumers in Vietnam.

2.3.3. Research model

This study proposes an integrated research model to explain consumer preference and purchase intention toward refurbished smartphones in Vietnam by combining environmental, social, and trust-related perspectives in a circular-economy and high-risk consumption context. Environmental awareness, environmental concern, and social influence are positioned as antecedents of consumer preference, while consumer preference directly predicts purchase intention. Retailer trust and product trust serve as moderators that reduce uncertainty and strengthen confidence, while gender and demographic characteristics are included as control variables in the model.

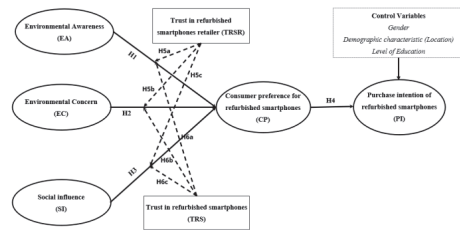


Figure 2.2: Proposed research model

Source: Authors' own work

CHAPTER 3: RESEARCH METHODS

3.1. Research context

The circular economy in Vietnam is still developing but has become increasingly important due to rising resource use and e-waste from short product lifecycles (UNDP, 2025; Nguyen et al., 2025). While circular practices offer environmental and economic benefits, Vietnam continues to rely on linear systems, creating pressure for more sustainable solutions (Khatun et al., 2025). In this context, the refurbished smartphone market is growing due to affordability and improved retail support, while environmental awareness increasingly shapes consumer attitudes. However, adoption remains dependent on trust and perceived risk, highlighting the link between circular economy development, e-waste challenges, and consumer behavior (Shariff & Shokouhyar, 2021).

3.2. Research process

This study develops a model to examine consumer intention toward refurbished smartphones in Vietnam within the circular economy context. It integrates environmental factors, social influence, and trust to explain how consumers evaluate and adopt refurbished products. Empirical analysis is conducted to test these relationships and assess their role in promoting sustainable consumption.

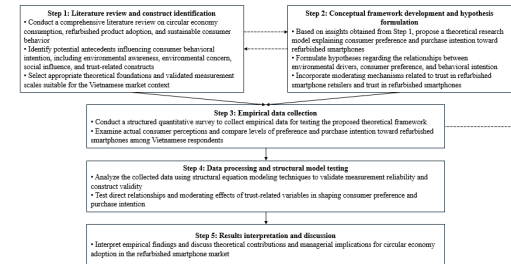


Figure 3.1: The Research Process of the Study

Source: Authors' own work

3.3. Questionnaire Development

The measurement instrument was developed through a five-step process, including translation, back-translation, expert review, pilot testing, and preliminary analysis, to ensure conceptual accuracy and linguistic clarity for Vietnamese respondents. This approach enhanced the reliability and validity of the questionnaire by aligning theoretical constructs with local context and respondent understanding.

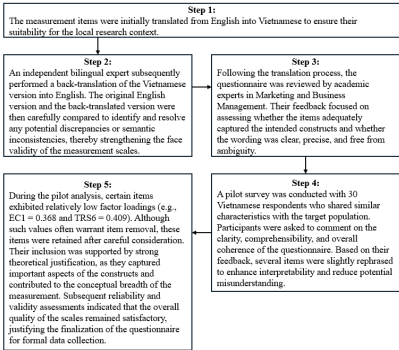


Figure 3. 2: Measurement Development and Validation Process

Source: Authors' own work

3.4. Measurement scales

This study employs a five-point Likert scale and adapts measurement items from previously validated studies to ensure reliability, validity, and comparability in assessing consumer perceptions. The scales were carefully modified and pre-tested to reflect the context of refurbished smartphones in Vietnam, thereby enhancing clarity, content validity, and contextual relevance.

Table 3. 1: Measurement items

Constructs	Items	Source
Environmental awareness	I consider the potential environmental impact of my actions when making my decisions.	(Shah <i>et al.</i> , 2021)
	I would like to describe myself as environmentally responsible.	
	I am worried about wasting and destroying the Earth's resources.	
	Even if I feel inconvenient, I would like to take more environmentally friendly actions.	
Environmental concern	I am very concerned about the environment.	(Paul, Modi and Patel, 2016)
	I would be willing to reduce my consumption to help protect the environment.	
	Major political change is necessary to protect the natural environment.	
	Major social changes are necessary to protect the natural environment.	
Social influence	Anti-pollution laws should be enforced more strongly.	(Li, 2013)
	It is important what my friends or colleagues think about me purchasing a refurbished smartphone.	
	I often identify with people by choosing to purchase a refurbished smartphone.	
	I like to know that purchasing a refurbished smartphone makes a good impression on my friends or colleagues.	
	I purchase a refurbished smartphone based on the expectations of my friends and colleagues.	

	I feel a sense of belonging with my friends and colleagues by purchasing a refurbished smartphone.	
	When I purchase a refurbished smartphone, I often consult other people for useful information to help choose the alternative that best fits my needs.	
	When I purchase a refurbished smartphone, I often ask my friends for useful information to solve problems.	
	When I purchase a refurbished smartphone, I frequently gather information from friends or colleagues.	
Consumer preference	I like using refurbished smartphones.	(Lu and Lin, 2002)
	I am favorable toward using refurbished smartphones.	
	It is beneficial to use refurbished smartphones.	
	It is wise to use refurbished smartphones.	
	Overall, my attitude toward using refurbished smartphones is positive.	
Trust in refurbished smartphones	I trust that refurbished smartphones are high-quality.	(Duong <i>et al.</i> , 2024)
	Refurbished smartphones are reliable.	
	I trust that refurbished smartphones are safe.	
	I trust that refurbished smartphones are fully traceable back to their origin.	
	I trust that refurbished smartphones are truthful.	
Trust in refurbished smartphones retailer	I trust that refurbished smartphones still retain the core quality and value of the original product.	
	I trust in refurbished smartphone retailers.	
	I rely on refurbished smartphone retailers.	
	These are honest refurbished smartphone retailers.	
	The refurbished smartphone retailer is very concerned about my welfare.	
Purchase intention	I plan to purchase a refurbished smartphone in my next smartphone purchase.	(Pichankhukarn and Vassanadumrongdee, 2020)
	I plan to recommend my peers to purchase refurbished smartphones in their next smartphone purchase.	
	I plan to ask for a refurbished smartphone in my next smartphone purchase.	

3.5. Data Collection and Sample

The study focuses on major urban areas in Vietnam, including Hanoi, Ho Chi Minh City, and Da Nang, where smartphone markets have reached a stage of saturation and consumer behavior is increasingly driven by replacement and upgrade decisions rather than first-time purchases. In this context, refurbished smartphones become more relevant as consumers evaluate alternatives based on value, functionality, and sustainability. Urban populations in these cities are more exposed to technology and market information, making them suitable for examining constructs such as environmental awareness, trust, and social influence, thereby enabling more reliable and informed responses. The final dataset includes 824 valid responses, thereby enhancing statistical reliability. A simple random sampling approach is applied, targeting Vietnamese smartphone users aged 16 and above, with data collected through both online and offline channels between May and July 2025. Screening procedures are implemented to ensure respondent relevance, thereby improving data quality, representativeness, and the robustness of the empirical findings.

CHAPTER 4:
RESULTS OF RESEARCH

4.1. Research sample

The sample of 824 respondents shows balanced representation across key demographics, with a slight male majority and a concentration in the 18–25 age group, complemented by other age segments. Occupational and educational distributions indicate a mix of students and working individuals, with a relatively high level of educational attainment, supporting informed responses. The sample is primarily drawn from major urban areas, enhancing relevance to urban consumer behavior while limiting generalizability to non-urban populations.

Table 4. 1: Demographic Characteristics of Respondents

Criteria		Frequency	Percentage
Gender	Male	503	61
	Female	321	39
Age	Below 18 years old	101	12.3
	From 18 to 25 years old	326	39.6
	From 26 to 35 years old	146	17.7
	Above 35 years old	251	30.5
Occupation	Employed	336	40.8
	Other	185	22.5
	Students	303	36.8
Education level	High school	151	18.3
	Associate degree	52	6.3
	Bachelor's degree	359	43.6
	Graduate studies	135	16.4
	Other	127	15.4
Place	Hanoi	344	41.7
	Du Nang	215	26.1
	Ho Chi Minh City	265	32.2

Source: Authors' own work

The descriptive statistics indicate that respondents generally reported moderate to high agreement across variables, with particularly strong perceptions of environmental awareness, social influence, and trust, while environmental concern and consumption preference remained more moderate. In contrast, risk-reduction trust items received the lowest evaluations, though overall variability and distribution suggest the data are suitable for further reliability and validity analysis.

Table 4. 2: Descriptive statistics of measurement items

Descriptive Statistics							
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
EA1	824	1	5	3.92	.796	-1.264	.085
EA2	824	1	5	3.92	.820	-.798	.085
EA3	824	1	5	3.92	.841	-.858	.085

EA4	824	1	5	4.03	.865	-1.017	.085
EC1	824	1	5	3.90	.733	-.570	.085
EC2	824	1	5	3.39	.941	-.228	.085
EC3	824	1	5	3.33	1.018	-.147	.085
EC4	824	1	5	3.28	.975	-.091	.085
EC5	824	1	5	3.74	.826	-.479	.085
SH1	824	1	5	3.90	.715	-.637	.085
SH2	824	1	5	4.16	.748	-.862	.085
SH3	824	1	5	3.87	.755	-.365	.085
SH4	824	1	5	3.84	.739	-.338	.085
SH5	824	1	5	3.97	.735	-.494	.085
SH6	824	1	5	4.02	.758	-.706	.085
SH7	824	1	5	4.02	.759	-.547	.085
SH8	824	1	5	4.00	.754	-.665	.085
CP1	824	1	5	3.72	.808	-.548	.085
CP2	824	1	5	3.69	.837	-.549	.085
CP3	824	1	5	3.56	.856	-.356	.085
CP4	824	1	5	3.23	.981	-.181	.085
CP5	824	1	5	3.36	.929	-.382	.085
PI1	824	1	5	3.94	.788	-.849	.085
PI2	824	1	5	3.74	.835	-.382	.085
PI3	824	1	5	3.69	.821	-.419	.085
TRS1	824	1	5	3.62	.883	-.311	.085
TRS2	824	1	5	3.61	.831	-.427	.085
TRS3	824	1	5	3.75	.862	-.543	.085
TRS4	824	1	5	3.70	.821	-.429	.085
TRS5	824	1	5	3.79	.822	-.839	.085
TRS6	824	1	5	4.12	.722	-.986	.085
TRSR1	824	1	5	3.40	.949	-.241	.085
TRSR2	824	1	5	3.16	.978	.003	.085
TRSR3	824	1	5	2.88	1.125	.100	.085
TRSR4	824	1	5	3.03	1.087	-.021	.085
Valid N (listwise)	824						

Source: Authors' own work

4.2. Data analysis and assessment of measurement validity

The CFA results indicate that the measurement model demonstrates an acceptable overall fit, with reliability and validity criteria (Cronbach's Alpha, CR, and AVE) meeting recommended thresholds. Although two items showed low factor loadings, they were retained due to their conceptual importance and minimal impact on overall scale quality.

Table 4. 3: Summary of the measurement model and convergent validity

Construct	Standardized factor loading	Cronbach Alpha
<i>Environmental awareness (EA)</i>		<i>.828</i>
EA1: I consider the potential environmental impact of my actions when making my decisions.	.699	
EA2: I would like to describe myself as environmentally responsible.	.649	
EA3: I am worried about wasting and destroying the Earth's resources.	.626	
EA4: Even if I feel inconvenient, I would like to take more environmentally friendly actions.	.645	
<i>Environmental concern (EC)</i>		<i>.810</i>
EC1: I am very concerned about the environment.	.368	
EC2: I would be willing to reduce my consumption to help protect the environment.	.690	
EC3: Major political change is necessary to protect the natural environment.	.738	
EC4: Major social changes are necessary to protect the natural environment.	.695	
EC5: Anti-pollution laws should be enforced more strongly.	.500	
<i>Social influence (SI)</i>		<i>.884</i>
SI1: It is important what my friends or colleagues think about me purchasing a refurbished smartphone.	.630	
SI2: I often identify with people by choosing to purchase a refurbished smartphone.	.685	
SI3: I like to know that purchasing a refurbished smartphone makes a good impression on my friends or colleagues.	.646	
SI4: I purchase a refurbished smartphone based on the expectations of my friends and colleagues.	.633	
SI5: I feel a sense of belonging with my friends and colleagues by purchasing a refurbished smartphone.	.664	
SI6: When I purchase a refurbished smartphone, I often consult other people for useful information to help choose the alternative that best fits my needs.	.661	
SI7: When I purchase a refurbished smartphone, I often ask my friends for useful information to solve problems.	.659	
SI8: When I purchase a refurbished smartphone, I frequently gather information from friends or colleagues.	.633	
<i>Consumer preference (CP)</i>		<i>.884</i>
CP1: I like using refurbished smartphones.	.668	
CP2: I am favorable toward using refurbished smartphones.	.702	
CP3: It is beneficial to use refurbished smartphones.	.764	
CP4: It is wise to use refurbished smartphones.	.732	
CP5: Overall, my attitude toward using refurbished smartphones is positive.	.744	
<i>Purchase intention (PI)</i>		<i>.807</i>
PI1: I plan to purchase a refurbished smartphone in my next smartphone purchase.	.643	
PI2: I plan to recommend my peers to purchase refurbished smartphones in their next smartphone purchase.	.673	
PI3: I plan to ask for a refurbished smartphone in my next smartphone purchase.	.649	
<i>Trust in refurbished smartphones (TRS)</i>		<i>.845</i>
TRS1: I trust that refurbished smartphones are high-quality.	.538	
TRS2: Refurbished smartphones are reliable.	.731	
TRS3: I trust that refurbished smartphones are safe.	.659	
TRS4: I trust that refurbished smartphones are fully traceable back to their origin.	.713	

TRS5: I trust that refurbished smartphones are truthful.	.712	
TRS6: I trust that refurbished smartphones still retain the core quality and value of the original product.	.409	
<i>Trust in refurbished smartphones retailer (TRSRI)</i>		<i>.864</i>
TRSRI1: I trust in refurbished smartphone retailers.	.630	
TRSRI2: I rely on refurbished smartphone retailers.	.763	
TRSRI3: These are honest refurbished smartphone retailers.	.753	
TRSRI4: The refurbished smartphone retailer is very concerned about my welfare.	.713	

Source: Authors' own work

Table 4. 4: Discriminant validity

	CR	AVE	MSV	MaxR(H)	SI	CP	EC	EA	PI
SI	0.889	0.501	0.439	0.890	0.708				
CP	0.885	0.607	0.408	0.888	0.488*	0.779			
EC	0.831	0.508	0.408	0.879	0.390*	0.639*	0.713		
EA	0.829	0.549	0.406	0.833	0.630*	0.396*	0.281*	0.741	
PI	0.808	0.584	0.439	0.809	0.663*	0.635*	0.455*	0.637*	0.764

Note(s): EA: Environmental awareness; EC: Environmental concern; SI: Social influence; CP: Consumer preference; PI: Purchase intention.

CR = Composite Reliability; AVE = Average Variance Extracted; MSV: Maximum Shared Variance; * $p < 0.05$; ** $p < 0.01$

Source: Authors' own work

4.3. Structural model and Hypothesis testing

The SEM results indicate that the proposed model achieves an acceptable overall fit, with key indices (CFI, TLI, RMSEA) meeting recommended thresholds despite a significant chi-square due to large sample size. Overall, the model demonstrates sufficient robustness and alignment with the data to support hypothesis testing. Table 4.5 shows that most hypothesized relationships are supported, with environmental awareness, environmental concern, and social influence all positively influencing consumer preference. Among these, environmental concern has the strongest effect, followed by social influence, while environmental awareness shows a smaller but significant impact, highlighting the combined role of cognitive, emotional, and social factors in shaping preferences.

Table 4. 5: Hypothesis testing results (standardization)

Structural path	Estimate	S.E	C.R	p-value	Hypotheses
EA → CP	0.143	0.055	2.596	**	H1: Accepted
EC → CP	0.503	0.037	13.558	***	H2: Accepted
SI → CP	0.333	0.073	4.579	***	H3: Accepted
CP → PI	0.267	0.036	7.439	***	H4: Accepted

Note(s): EA: Environmental awareness; EC: Environmental concern; SI: Social influence; CP: Consumer preference; PI: Purchase intention; S.E: Standard Error; CR: Critical Ratios; C.R: Composite Reliability.

n.s.: Not Significant; **p<.01; ***p<.001.

Source: Authors' own work

Figure 4.1 shows that environmental awareness, environmental concern, and social influence positively affect consumer preference, which in turn increases purchase intention, with environmental concern having the strongest impact. Environmental awareness also directly influences purchase intention, while trust variables do not show a significant moderating effect.

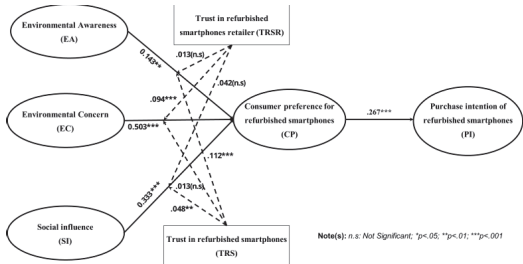


Figure 4.1: Test results of the theoretical research model (standardization)

Source: Authors' own work

4.4. Moderation test

Table 4.6 shows that moderating effects vary across trust types: product trust (TRS) significantly strengthens the effects of environmental awareness and social influence on consumer preference, whereas retailer trust (TRSR) moderates only the relationship between environmental concern and preference. Several interactions are not significant, indicating that trust does not uniformly amplify all relationships in the model. Overall, the results highlight that different forms of trust operate through distinct mechanisms to shape consumer preferences for refurbished smartphones.

Table 4.6: Moderating Effects of Trust in Refurbished Smartphones and Retailers

Structural path	β	t-value	p-values	95% C.I.	Conclusion
EA x TRSR \rightarrow CP	0.013	0.472	n.s.	(-0.042, 0.069)	H5a: Not supported
EA x TRS \rightarrow CP	0.112	6.739	***	(0.079, 0.144)	H6a: Accepted
EC x TRSR \rightarrow CP	0.094	3.791	***	(0.045, 0.142)	H5b: Accepted
EC x TRS \rightarrow CP	0.013	0.732	n.s.	(-0.022, 0.048)	H6b: Not supported
SI x TRSR \rightarrow CP	0.042	1.734	n.s.	(-0.006, 0.090)	H5c: Not supported
SI x TRS \rightarrow CP	0.048	2.928	**	(0.016, 0.080)	H6c: Accepted

Note(s): EA: Environmental awareness; EC: Environmental concern; SI: Social influence; CP: Consumer preference; TRSR: Trust in refurbished smartphones retailer; TRS: Trust in refurbished smartphones.

β : standardized path coefficient; C.I.: Confidence Interval; n.s.: Not Significant; **p<.01; ***p<.001.

Source: Authors' own work

4.5. Demographic differences in purchase intention

One-way ANOVA was used to examine whether purchase intention toward refurbished smartphones differed across gender, location, and completed education level, with purchase intention measured by the standardized regression factor score of PI. Descriptive statistics, F statistics, p-values, and robust test results were reported for 824 valid responses, and group differences were considered statistically significant when $p < 0.05$.

Table 4. 6: Descriptive statistics of purchase intention by demographic groups

Demographic variable	Group	N	Mean	SD	SE
Gender	Male	503	0.070	0.931	0.042
	Female	321	-0.110	1.091	0.061
Location	Hanoi	344	-0.078	1.098	0.059
	Da Nang	215	0.046	0.921	0.063
	Ho Chi Minh City	265	0.063	0.921	0.057
Completed education level	High school	151	0.065	0.892	0.073
	Associate degree	52	-0.039	0.860	0.119
	Bachelor's degree	359	0.011	0.986	0.052
	Master's or Doctoral degree	135	-0.105	1.161	0.100
	Other	127	0.020	1.035	0.092

Note: PI was measured using the standardized regression factor score.

Source: Authors' own work.

Table 4.7 shows modest descriptive differences in purchase intention across demographic groups, with the clearest gap appearing between male and female respondents, as males reported slightly higher purchase intention than females. Location showed a small increase from Hanoi to Da Nang and Ho Chi Minh City, while education displayed no clear linear pattern, indicating that statistical testing was needed to determine whether these differences were meaningful.

Table 4. 8: One-way ANOVA results for demographic differences in purchase intention

Hypothesis	Grouping variable	Between-group SS	Within-group SS	df	F	p-value	Welch statistic	Welch p-value	η^2	Result
H7	Gender	6.373	816.627	1, 822	6.415	0.011	5.984	0.015	0.008	Supported
H8	Location	3.580	819.420	2, 821	1.794	0.167	1.695	0.185	0.004	Not supported
H9	Completed education level	2.312	820.688	4, 819	0.577	0.680	0.516	0.724	0.003	Not supported

Note: η^2 was calculated as between-group sum of squares divided by total sum of squares.

Source: Authors' own work

The ANOVA result showed a significant gender difference in purchase intention toward refurbished smartphones, $F(1, 822) = 6.415$, $p = 0.011$, which was also confirmed by the Welch robust test. Male respondents reported higher purchase intention than female respondents, but the small effect size, $\eta^2 = 0.008$, indicates that gender is a statistically significant yet weak demographic differentiator.

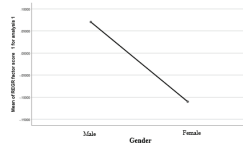


Figure 4. 2: Mean plot of purchase intention by gender

Source: Authors' own work

Figure 4.2 supports the ANOVA finding by showing that male respondents had a higher mean purchase intention score than female respondents, although the visual gap remains modest. For location, neither the ANOVA nor the Welch test was significant, indicating that the slightly higher scores in Da Nang and Ho Chi Minh City compared with Hanoi do not represent a reliable difference in purchase intention.

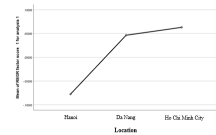


Figure 4. 3: Mean plot of purchase intention by location

Source: Authors' own work

Figure 4.3 shows a slight descriptive increase in purchase intention from Hanoi to Da Nang and Ho Chi Minh City, but the non-significant ANOVA and Welch results indicate that location does not statistically differentiate purchase intention. Similarly, completed education level showed no significant difference in purchase intention, suggesting that education does not meaningfully distinguish consumers' intention to purchase refurbished smartphones.

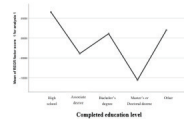


Figure 4. 4: Mean plot of purchase intention by completed education level

Source: Authors' own work

Figure 4.4 shows an unstable pattern across education groups, with no consistent upward or downward trend, supporting the conclusion that completed education level does not meaningfully differentiate purchase intention. Overall, the ANOVA results indicate that only gender showed a statistically significant but small difference, while location and education had limited explanatory value in distinguishing consumers' purchase intention toward refurbished smartphones.

4.6. Gender-based multi-group structural analysis

A gender-based multigroup analysis was conducted to examine whether structural relationships differ between male and female respondents, with the model estimated simultaneously for both groups. The results indicate an acceptable model fit ($\chi^2/df = 2.929$), suggesting that the proposed framework adequately represents the data across gender segments.

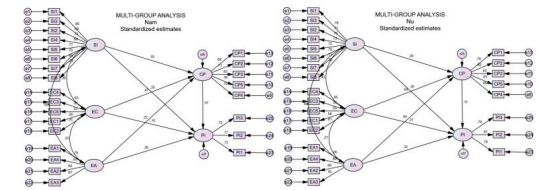


Figure 4.5: Multi-group analysis by gender of the proposed model (Male and Female)

Source: Authors' own work

Additional fit indices indicate acceptable model adequacy for cross-group comparisons, with GFI, TLI, and CFI approaching recommended thresholds, and RMSEA (0.048) indicating close model fit. Compared to the independence model, the superior fit of the proposed model confirms its ability to capture meaningful relationships among the key constructs.

Table 4. 9: Goodness-of-fit indices of the multi-group structural model by gender

Model	Chi-square	Df	P	GFI	TLI	CFI	RMSEA
Default model	1552.427	530	0.000	0.855	0.892	0.904	0.048
Saturated model	0.000	0	—	1.000	1.000	1.000	0.000
Independence model	11286.894	600	0.000	0.239	0.000	0.000	0.147

Source: Authors' own work

The multigroup analysis shows that environmental awareness influences consumer preference only among males, while environmental concern and social influence affect both genders, with stronger effects for females. Consumer preference drives purchase intention among males but not females, indicating that males follow a more direct cognitive pathway, whereas females rely more on value-driven and contextual factors.

Table 4.10: Results of structural relationship testing by gender (Male vs Female)

Relationship	Estimate (Male)	Estimate (Female)	S.E. (Male)	S.E. (Female)	C.R. (Male)	C.R. (Female)	P (Male)	P (Female)	Hypothesis
EA → CP	0.319	0.041	0.102	0.071	3.144	0.586	0.002	0.558	H1: Supported (Male only)
EC → CP	0.388	0.649	0.042	0.067	9.288	9.736	***	***	H2: Supported
SI → CP	0.280	0.318	0.101	0.108	2.756	2.934	0.006	0.003	H3: Supported
CP → PI	0.463	0.081	0.054	0.053	8.542	1.529	***	0.126	H4: Supported (Male only)

Source: Authors' own work

CHAPTER 5:
DISCUSSION AND IMPLICATIONS

5.1. Discussion of the results

The findings indicate that purchase intention toward refurbished smartphones is shaped mainly by psychological and product related factors rather than by demographic characteristics alone. Environmental concern, social influence, and consumer preference play central roles, while trust operates selectively; product trust strengthens the effects of environmental awareness and social influence, whereas retailer trust strengthens the effect of environmental concern. This suggests that consumers' adoption of refurbished smartphones depends not only on sustainability values, but also on confidence in product quality and market credibility. The demographic analysis provides a more limited explanation of purchase intention. Among gender, location, and completed education level, only gender shows a statistically significant difference, with male respondents reporting slightly higher purchase intention than female respondents; however, the effect size is small. Location and education do not significantly differentiate purchase intention, indicating that demographic segmentation has limited explanatory power compared with environmental motivation, trust, perceived risk, and product preference.

5.2. Theoretical Contributions

Theoretically, the study contributes by integrating environmental psychology and trust-based perspectives to explain sustainable consumption in a high-uncertainty circular-economy context. It shows that environmental awareness, environmental concern, and social influence do not operate independently; rather, their effects on consumer preference depend partly on appropriate trust conditions, especially trust in the product and trust in the retailer. The study also refines the role of demographic control variables by showing that their explanatory power is limited and uneven. Gender significantly differentiates purchase intention but with a small effect size, while location and completed education level do not show significant effects, suggesting that refurbished smartphone adoption is better explained by psychological and product-specific factors than by broad demographic categories.

5.3. Practical Implications

The findings suggest that promoting refurbished smartphones requires more than communicating environmental benefits. Businesses should combine environmental messaging with risk reduction, social validation, product transparency, and trust-building mechanisms such as clear product grading, warranty policies, inspection reports, return policies, and reliable after-sales support. From a practical perspective, demographic segmentation should be used cautiously. Gender may inform communication tone because male consumers showed slightly higher purchase intention, but its effect was small; meanwhile, location and education did not significantly differentiate purchase intention, suggesting that firms should prioritize product credibility, accessible information, and trust-building strategies over broad demographic targeting.

5.4. Limitations of the research

This study has several limitations related to model scope, research design, and sampling. The model did not include potentially important variables such as economic incentives, perceived risk, income, price sensitivity, technical knowledge, or individual economic conditions; the cross-sectional design also limits causal interpretation, while nonprobability sampling from mainly urban and digitally connected respondents may restrict generalizability. Future studies should extend the model by incorporating additional psychological, economic, demographic, and product-related control variables to better explain refurbished smartphone purchase intention. Longitudinal designs, more diverse sampling strategies, advanced SEM techniques, cross-cultural comparisons, and further investigation of digital platforms such as e-commerce and social media could strengthen causal evidence, model robustness, and external validity.

5.5. Conclusion

This thesis shows that purchase intention toward refurbished smartphones in Vietnam is shaped mainly by consumer preferences, which translate environmental concern, awareness, and social influence into intention. Its key novelty lies in distinguishing two forms of trust: trust in refurbished smartphones and trust in retailers, showing that each supports different parts of the decision-making process. The demographic results add that gender creates a small but significant difference in purchase intention, while location and education do not. Overall, the thesis contributes to circular economy and sustainable consumption research by showing that refurbished smartphone adoption depends not only on environmental values, but also on product credibility, retailer trust, and reduced consumer uncertainty.

**LIST OF WORKS RELATED TO THE DISSERTATION
THAT THE PHD CANDIDATE HAS PUBLISHED**

1. Nguyen, D. S., & Nguyen, D. T. (2026). 'Refurbished Smartphones in the Circular Economy: Insights from Environmental and Consumer Perspectives', *Circular Economy and Sustainability*, 6 (2), 1-22.
<https://doi.org/10.1007/s43615-026-00731-7>