

Impact Of Artificial Intelligence Marketing On Customer Satisfaction With Electronic Products In Hai Phong City

Do Minh Thuy¹, Pham Minh Dat^{2*}

¹Faculty of Economics and Business Administration, Haiphong University, Haiphong city, Vietnam.

Email: thuydm@dhhp.edu.vn Orcid: <https://orcid.org/0009-0000-6548-4817>

^{2*}Journal of Commercial Science, Thuongmai University, Hanoi city, Vietnam

Email: minhdat@tmu.edu.vn, Orcid: <https://orcid.org/0000-0002-7262-4299>

Citation: Pham Minh Dat, et al. (2024), Impact Of Artificial Intelligence Marketing On Customer Satisfaction With Electronic Products In Hai Phong City, *Educational Administration: Theory And Practice*, 30(4), 2356-2368

Doi: 10.53555/kuey.v30i4.1858

ARTICLE INFO

ABSTRACT

In the context of a developing economy, it is evident that the 4.0 Industrial Revolution, characterized by AI, big data, and IoT, has a substantial impact on the global economy and the operational strategies of economic stakeholders. Furthermore, there exists intense competition among businesses, all striving to secure a significant market share. As a result, it is imperative to adapt to the prevailing trend, which emphasizes the essential integration of AI, specifically Artificial Intelligence Marketing (AIM), to enhance customer satisfaction. AIM, in particular, plays a crucial role in shaping customers' contentment with electronic products in Hai Phong City. Consequently, this research aims to explore and discuss the marketing implications of AI as a commercial service and its influence on electronic products. This study adopts a customer-centric perspective, focusing on the evaluation of AIM's effects on customer satisfaction with electronic products in Hai Phong City. The investigation is based on a survey involving 500 online electronic shoppers. Findings from the research analyzed using structural modeling (SEM), reveal five key factors impacting customer satisfaction with electronic products: Artificial Intelligence Marketing (AIM), Customer Participation in customer satisfaction (INVO), Customer Attitude (ATT), Willingness to Co-create (WCC), and Customer Satisfaction (CS). Notably, artificial intelligence marketing and customer co-creation emerge as the most significant factors influencing customer satisfaction with electronic products in Hai Phong City.

Keywords: Marketing; Artificial intelligence; Customer satisfaction; electronic products; Hai Phong City.

1. Introduction

In today, dynamic business landscape, the emphasis on customer satisfaction and service quality has become increasingly crucial as industries and businesses continue to expand. Each industry caters to a diverse customer base, and in the case of Hai Phong City's electronic products sector, it serves a substantial number of existing and potential customers, each with distinct characteristics, preferences, and levels of satisfaction with various electronic product brands. It is imperative to gain a deep understanding of each customer's unique needs and preferences. Fortunately, in today's interconnected society, this task has been significantly eased, thanks to cutting-edge tools such as Artificial Intelligence Marketing (AIM). AIM bridges the gap between businesses and customers, providing customers with comprehensive information about the electronic products they desire. Therefore, harnessing and comprehending the potential of artificial intelligence marketing tools is essential for brands and businesses to enhance the quality of service for electronic products and retain their customer base.

However, within the academic research landscape of Hai Phong City, this specific area of study has been relatively underexplored. Thus, there is a pressing need to propose a model that can analyze the impact of artificial intelligence marketing tools on customer satisfaction with electronic products within the context of Hai Phong City's electronic industry.

To address this research gap, our team embarked on an investigation to assess the influence of artificial intelligence marketing on customer satisfaction with electronic products in Hai Phong City, aiming to provide a viable solution to this pertinent societal issue.

In pursuit of our research objectives, our thesis employs a combination of qualitative research methods to refine and augment independent variables affecting the dependent variable, which is service quality in the electronic industry. We have revised the questionnaire accordingly, employing a 5-level Likert scale. In addition to questions related to personal demographics such as gender, age, educational background, and hometown, the questionnaire comprises 36 observation questions focusing on the variables of our study.

Our research approach involves the application of theoretical frameworks to construct a regression model for measuring the impact of artificial intelligence marketing on customer satisfaction with electronic products in Hai Phong City. The second method we employ is quantitative research, conducted through direct interviews and survey methods. The measurement model encompasses 36 observed variables, and we have employed non-random sampling through a convenient sampling method. The data collected was subsequently entered and analyzed using the SPSS and AMOS software packages.

2. Overview of theoretical research

A theoretical overview of marketing

Marketing is a fundamental business process that nurtures customer relationships and strives to meet customer satisfaction. Customer-centricity stands as a cornerstone in effective business management (Definition of Marketing, 2013). It encompasses various key elements, including marketing strategies, communication, brand development, design, pricing, market research, customer psychology, market positioning, and performance evaluation. At the heart of marketing lies the essential ability to comprehend customer preferences and desires, which, in turn, facilitates the persuasion of customers to engage with a product or service, forming the bedrock for long-term development.

Marketing serves as the conduit to connect with customers effectively, encompassing all the necessary endeavors to attract customers to a brand and maintain enduring relationships with them.

As articulated by the renowned marketing scholar, Philip Kotler, often referred to as the "father" of modern marketing, marketing can be defined as the science and art of uncovering, creating, and delivering value to fulfill the needs of target markets while aiming for profitability. It involves the identification of unmet needs and wants, the measurement and quantification of the potential benefits in the identified market, and the identification of segments where a company can best provide its services. Marketing also involves the development and promotion of tailor-made products and services to cater to these specific market segments (Kotler, Philip; Marketing Management, 2016).

Theoretical overview of artificial intelligence

In the realm of computer science, artificial intelligence (AI), sometimes referred to as artificial intelligence, represents the display of intelligence by machines, distinct from the innate human intelligence. Typically, the term "artificial intelligence" pertains to machines, or computers, capable of emulating cognitive functions associated with human thought processes, such as learning and problem-solving. As machines advance in capabilities, tasks formerly categorized as requiring "intelligence" are often excluded from the AI definition, a phenomenon termed the AI effect. A principle akin to Tesler's Theorem asserts that "AI encompasses the uncharted territory" (Maloof, Mark, "Artificial Intelligence: Introduction," 2018). Alternative research argues that AI is a complex artificial computer program control system (encompassing virtual electronics, mechatronics, bioelectronics-mechanical or hybrid) with its cognitive-functional architecture and computational power, possessing a high degree of cognitive ability, the capacity for improvement, self-adaptation, knowledge accumulation, and experience simulation, including human experiences. The Larousse dictionary defines artificial intelligence as "a set of theories and techniques used to construct machines capable of simulating human intelligence" (Cahier Vacances, 2018).

From a legal perspective, numerous studies aim to investigate the effects and impacts of AI on various facets of socio-economic life, the challenges posed, and the proposal of legal policies for regulation. Notable publications, such as the "WIPO Technology Trends 2019 - Artificial Intelligence" by the World Intellectual Property Organization (WIPO), offer in-depth analysis based on specific data and expert assessments. This publication explores the effects of AI from various angles, including its impact on intellectual property. Furthermore, articles like "Key issues arising from AI and policy responses" delve into AI's influence on employment, network security, data security, superintelligence, and technology control (government or private) (WIPO, 2019). In response to the challenges posed by AI technology, governments worldwide grapple with the need to foster scientific and technological development while addressing its implications through mechanisms and legal policies. Some authors focus on the legal nature of AI and the legal framework governing AI-related legal relationships.

Research related to AI from a legal standpoint is still relatively limited and lacks a multidimensional approach.

AI is playing a transformative role across multiple facets of life, becoming an indispensable element in numerous industries, including commerce, healthcare, transportation, and labor, across many countries. In the economic domain, research by the World Auditing Company PwC predicts that AI will be the most significant commercial opportunity in the rapidly evolving global economy, potentially contributing up to 15.7 trillion USD by 2030 (Valentina Barucci, 2020, Son et al, 2023). Consequently, AI has become the focal point of competition among various developed countries, most notably the United States and China, both of which have established extensive AI development plans and strategies, designating AI technology as a central driving force for economic acceleration.

In Hai Phong City, AI is rapidly gaining ground, supplanting manual labor in various sectors. AI's prominence is growing as a pivotal driver for the country's socio-economic development. The government believes that AI will be a transformative technology in the coming decade, and it is determined to harness this potential as a catalyst for the Fourth Industrial Revolution. To this end, the government has crafted a national strategy for the Fourth Industrial Revolution, with a primary focus on AI development, encompassing policy initiatives that prioritize human resources, including high-level AI training institutions, support for AI adoption within the business sector, and targeted investments in AI through funds and innovation centers.

In the 21st century, AI techniques have experienced a resurgence, driven by advances in computer processing power, the availability of big data, and a deeper understanding of AI theory. AI engineering has become integral to the technology industry, offering solutions to complex problems in machine learning, software engineering, and operations research.

Research overview of artificial intelligence marketing

In the modern business landscape, the utilization of intelligent tools to cater to the diverse needs and preferences of customers has become imperative. To attract and retain customers, businesses must meticulously strategize, expand their markets, and comprehend customer requirements. Consequently, customers can access vast amounts of information regarding the products they seek through various channels. Artificial Intelligence (AI) plays a pivotal role in facilitating connections between marketers and consumers. Unlike innate human intelligence, which is personally owned, AI manifests through humanoid and non-human devices programmed by humans to serve commercial and human objectives. AI applications in businesses and organizations are akin to commercial services designed to generate benefits and value for relevant stakeholders, including customers and service providers. This perspective aligns with the marketing literature's definition of a service as "economic activities provided by one party to another" (Wirtz, Chew, & Lovelock, 2013, p. 15).

Artificial Intelligence Marketing (AIM) harnesses AI technology to gather customer insights and data, predict customer behavior, and make automated decisions that influence marketing strategies. AI serves as a driving force for improving marketing Return on Investment (ROI). With AI, marketers can gain profound insights into customer behavior, predict their actions, and signals, enabling them to execute effective strategies to target customers.

The impact of AI on digital marketing is substantial. A significant percentage of customers, 76% to be precise, expect companies to comprehend their needs and expectations (Fernandes, T, & Remethe, P. 2016). AIM empowers marketers to collect extensive analytical data swiftly from social media marketing, email, and websites. Therefore, AI marketing is exceedingly crucial for businesses, particularly AI Marketing in Hai Phong City.

The advantages of AIM yield numerous benefits, including:

Enhanced Marketing Automation: AI augments the intelligence of marketing automation, converting data into actionable insights rapidly and accurately. AI accelerates the execution and deployment of marketing tasks, allowing marketers to scale the number of campaigns, identify optimal actions for customers, and determine the most suitable campaigns for specific customers.

AI's role in email marketing automation is instrumental in increasing customer engagement and email open rates. It optimizes headlines for clicks and monitors their performance, outperforming human copywriters. AI also creates and optimizes user-friendly, relevant content across various email formats.

Error Reduction: AI helps mitigate human errors, particularly concerning data security, which is a pressing concern for businesses. AI adapts and reacts to a company's cybersecurity needs, enhancing data protection and reducing vulnerabilities to cyberattacks.

Cost Savings: AI significantly reduces operational costs by expediting tasks, enhancing efficiency, and minimizing errors. By automating repetitive tasks, AI streamlines operations, leading to cost savings. Employees can shift their focus to more critical tasks, maximizing productivity.

Increased ROI with Marketing AI: AI empowers marketers to understand customers better, design accurate customer journeys, and implement personalized adjustments, ultimately enhancing ROI on customer

interactions. Marketers can analyze customer insights deeply and optimize marketing efforts, avoiding campaigns that irritate customers.

Enhanced Personalization: AI enhances marketing personalization across websites, emails, social media, videos, and other content, addressing customers' specific preferences. Mobile-friendly push notifications, tailored to individual customers, increase engagement and provide a personalized experience.

Smarter and Faster Decision Making: AI processes data swiftly and accurately, enabling real-time decision-making. AIM gathers real-time tactical data, allowing marketers to make informed decisions promptly and execute effective campaigns powered by AIM bots.

Customer satisfaction with electronic products in Hai Phong City

In any industry, paying close attention to customer satisfaction is paramount, especially in the field of electronic products in Hai Phong City. The electronic products industry is known for its technological innovations and rapidly evolving trends, making it essential to stay attuned to customer preferences and the industry's fast-paced development. Electronic products encompass a wide range of items, including consumer electronics, gadgets, and tech accessories. Many customers in this sector are tech-savvy individuals, and a substantial portion of their shopping occurs online. Consequently, brands, businesses, and retail outlets selling electronic products must proactively engage with customers, ensuring a strong online presence and providing comprehensive product information through various channels. Online shopping platforms such as Shopee, Lazada, TikTok, Tiki, Facebook, and Zalo, among others, enable customers to access a wide variety of electronic products, compare prices, and gather product details from different distributors. The intelligent features of artificial intelligence tools significantly contribute to customer satisfaction, reflecting positively on the service quality provided by businesses, companies, websites, and advertising distributors.

To elaborate further, customer satisfaction is the feeling of contentment experienced by customers immediately after their expectations, needs, and desires are met in the best and most comprehensive way possible. Customer satisfaction typically results from the accumulation of customer experiences during the process of shopping or using products and services provided by businesses. As such, customer satisfaction is a crucial factor in enhancing the service quality of electronic product distributors. It is through smart features and customer feedback that marketing personnel can gain experience and devise strategies to improve their product offerings.

This research contends that AIM is considered a component of overall service quality with financial implications for organizations. Service quality denotes the excellence of services provided to meet and exceed customer expectations and is often evaluated based on customer perceptions of an organization's services (Parasuraman et al., 1995). Service quality is widely recognized as a precursor to customer satisfaction and loyalty (Prentice, 2013, 2014; Zeithaml et al., 1996). Until now, no study has incorporated AIM into service quality evaluation or attempted to understand its impact on organizational performance, as reflected in customer-related outcomes (satisfaction and loyalty).

Despite service organizations (electronic products) offering AI services to enhance business efficiency and customer experiences, a review of related literature shows that very few academic studies have attempted to understand how consumers/customers respond to these services. Given that AI service quality relies on technology, customer reactions can depend on their attitude and experience with the technology. Previous research suggests that technology-based services can influence customer satisfaction and loyalty. Using a significant incident, Mueter, Ostrom, Roundtree, and Bitner (2000) found that self-service technology (SST) created both positive and negative incidents for different customers. Positive incidents included SST addressing enhanced needs, improved service performance on each channel, ease of use, and cost and time savings. Technology applications positively impacted customer satisfaction.

3. Research model

To understand the intention to adopt hyper-personalization through digital customers in the electronic industry, the present study proposed a conceptual framework based on the hypothetical factors proposed below. In the recommendation model, the extended TBRA represents the customer's intention to accept in a personalized way.

The researchers used three main structures from the TBS model (Heidenreich & Handrich, 2015) namely INNO, WCC, and AIM; perceptions, attitudes, subjective norms, and intentions to apply. In addition to the structures from the TBS model, the structures of TRA and the structures representing the preformal char, i.e. INVO, are also included in the assimilation process. Despite this, various published studies have shown the benefits of co-creation from different futures (Chen & Wang, 2016; Kamboj & Gupta, 2020; Sahi, Sehgal, & Sharma, 2017; Zaborek & Mazur, 2019), this type of profiling study is crucial to understand the importance of

the concept of co-creation with hyper-personalization using customer digitalization using customer data in the consumption of electronic products.

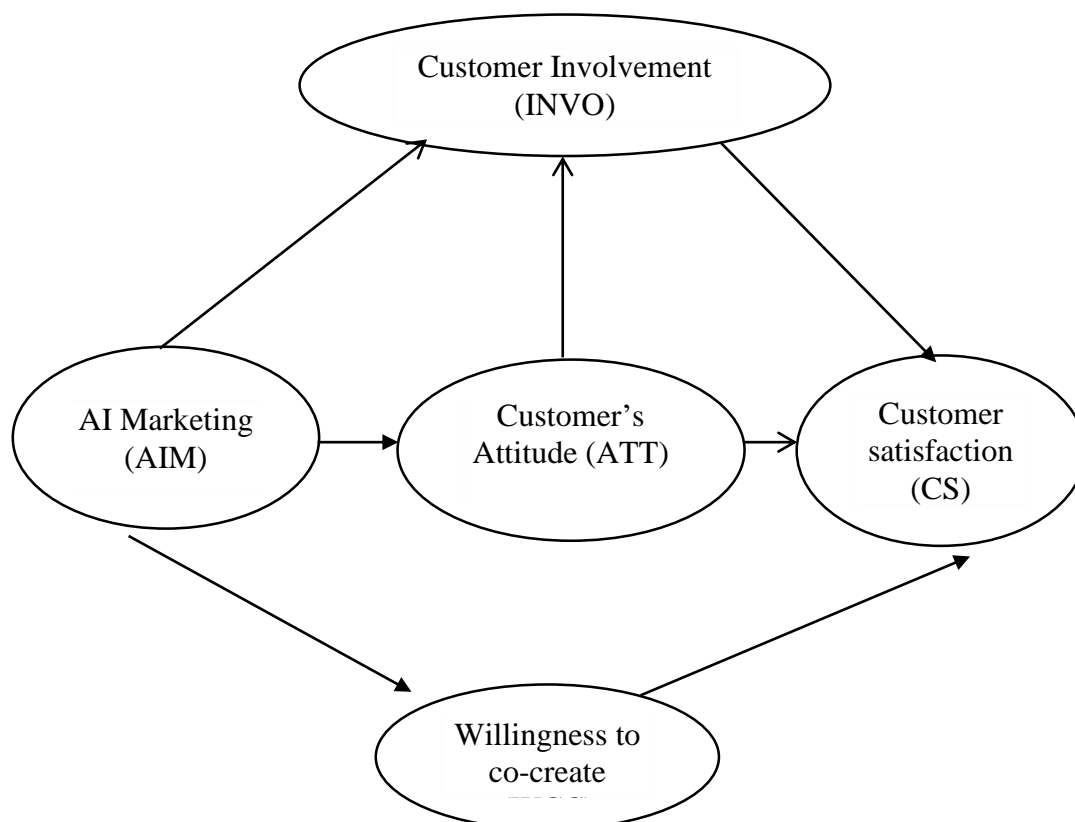


Fig 1: Research model of the impact of AI on electronic marketing
(Source: Compiled by Author)

4. Research hypotheses.

Artificial intelligence marketing (AIM) with the participation of electronic consumers (INVO)

Artificial intelligence marketing will promote customer participation in improving product quality; artificial intelligence will make customer engagement faster, earlier than traditional information collection channels (Geetika Jain, 2021). It is the trend that an individual adopts technology products new in the past more often than in others and more often (Rogers, 2003; Sahin, 2006). Electronic innovation is an important factor that plays an important role in adoption intention and it leads to the adoption of new electronic products (Jordaan & Simpson, 2006; Rahman et al, 2014). Previous studies demonstrate that in the electronic industry, an individual with innovative behavior is inevitably inclined to use new technologies that establish a link between engagement and innovation (Cardoso; Costa, & Novais, 2010; Rahman et al, 2014)

H1: Artificial intelligence marketing has a positive impact on electronic consumer engagement

Artificial intelligence marketing (AIM) with co-creation readiness (WCC)

To jointly create innovative solutions, it is important that artificial intelligence has a fast and effective impact on personalized electronic design; A very high level of customer involvement is also required to design personalized services because of an individual's quality time, just as resources are required to develop such a service (Fernandes & Remelhe), 2016; Rodie & Kleine, 2000).

H2: Artificial intelligence marketing has a positive impact on willingness to co-create.

Artificial Intelligence Marketing (AIM) with Customer Attitudes (ATT)

According to Forbes Insights statistics, currently, only about 37% of businesses are using AI, but 47% agree that those who do not invest in AI will be at high risk of being beaten by competitors to take the position. From there, we can see the impact of AI on the business and marketing activities of enterprises. Artificial intelligence not only provides detailed information about the target audience but also facilitates businesses to improve the customer experience better. Therefore, the marketing staff also understand the customer and offer it information as well as develop strategies to attract new customers and retain old customers. Customer emotions are one of the important factors contributing to the revenue and growth of a company.

H3: Artificial intelligence marketing has a positive impact on customer attitudes

Customer Attitude (ATT) to Customer Satisfaction (CS)

According to the theory of rational action (TRA) (Ajzen & Fishbein, 1980; Davis, 1993), an individual's attitude plays an important role in determining an individual's behavioral beliefs about the use of science and technology applications and their intention to apply. Attitudes have a great impact on consumer participation while evaluating different criteria and cumulatively lead to a change in intention to apply for personalized local apparel in case customers use trendy trends.

H4: Customer attitude positively affects customer satisfaction.

H4a: The attitude of electronic consumers is positively related to the effectiveness of electronic product marketing.

H4b: Electronic consumer attitudes are positively related to customer engagement using customer digital for hyper-personalization.

Customer Engagement (INVO) with Customer Satisfaction (CS)

Customer involvement is the degree to which an individual is involved in various tasks such as creating, producing, and providing services. By doing so, the company is trying to increase the scope and role of an individual's involvement at different stages in the service innovation process to meet individual requirements and needs (Alam, 2006; Bitner & Brown, 2008; Nambisan, 2002).

Participation in electronics promotes the consumer acceptance process in which an individual participates in a trend that intends to adopt and thus change behavior (Rahman et al., 2014). The degree of participation depends on the individual characteristics of an individual's knowledge of electronic and it leads to the generation of intention to adopt personalized services that have a strong influence on the purchasing behavior of individual customers (O'Cas, 2000). The effect has been remarkable; it claims that consumer engagement has a tremendous impact on consumer trust, which in turn leads to customer satisfaction and co-creation.

H5: Customer participation has a positive impact on customer satisfaction

Willingness to co-create (WWC) with customer satisfaction (CS)

There are different characteristics of an individual that can be used to predict their behavior towards innovative or personalized services and products in the electronic industry (Aldas-Manzano, Lassala-Navarr'e, Ruiz-Maf'e, & Sanz-Blá, 2009; Rahman et al, 2014). Furthermore, it has been stated that there are various extrinsic and intrinsic motivations influencing the development, adoption, and adoption intentions of innovative personalized services and products in the industry electronic (Aldas-Manzano et al, 2009).

H6: Willingness to co-create has a positive impact on customer satisfaction with electronic products

Consumer Attitudes (ATT) to Electronic Consumer Engagement (INVO)

According to the theory of rational action (TRA) (Ajzen & Fishbein, 1980; Davis, 1993), an individual's attitude plays an important role in determining an individual's behavioral beliefs about the use of science and technology applications and their intention to apply. Attitude has a great impact on consumer participation while evaluating different criteria and cumulatively leads to a change of mind to apply toward personalized local apparel in the case of young customers age (Shim, Morris, & Mogan, 1989). Neeman and Harter (1986) considered that involvement in electronic products and commitment to a particular brand at the same time indicate the intention to apply a particular brand is of high importance.

H7: Customer attitude positively affects customer engagement

5. Research design

Qualitative research was conducted on 50 survey subjects. After many corrections, the final questionnaire was built and put into the quantitative survey. The survey questionnaire uses a 5-point Likert scale to build (in which the ratings are as follows: 1: Strongly disagree; 2: Disagree; 3: Normal; 4: Agree; 5: Strongly agree), in addition to questions about personal information such as gender, age, education, occupation, hometown, the questionnaire includes 36 observational questions for research variables.

The quantitative survey was conducted from February 2023 to May 2023. This quantitative research was conducted through face-to-face interviews and online surveys via the internet. Non-random sampling method - convenience sampling. The measurement model includes 36 observed variables, according to Hair & ctg (1998), the required sample size is $n = 180 (36*5)$. To achieve the set sample size, the authors sent questionnaires to interview over 500 subjects, the results obtained 482/496 valid samples (some of which were rejected because of poor survey quality close). Data was entered and analyzed using SPSS and AMOS software.

6. Research results

6.1. Description of survey results

Descriptive statistical analysis of the data showed that the non-random sampling method - convenience sampling was not guaranteed, for example, the sex ratio of the survey participants was uneven (female 37.34%, male 62.66%), or respondents were mainly young people (age 18-34) and currently living and working in Hai Phong city. This can be explained as follows: the characteristics of the electronic industry that pay a lot of attention to and often for hop are women and young people, who are working and living in big cities they have many opportunities to access technology, electronic stores, easy shopping... that's why they have a lot of access to marketing services in the electronic field. However, the research sample still has a diversity of qualifications and occupations.

The author group conducted a large sample of 482 people by direct survey method during the period from February 2023 to May 2023. The number of respondents was 482 valid votes, with details in the table below. this:

Table 1: Descriptive statistics of the survey sample

No	Criteria	Frequency (S)	Ratio (%)
I	Gender	482	100
1	Male	302	62.66
2	Female	180	37.34
II	Age	482	100
1	18-24	164	34.02
2	25-34	213	44.19
3	35-44	78	16.18
4	Over 44	27	5.60
III	Education	482	100
1	Common	14	2.90
2	Intermediate degree	72	14.94
3	College degree	275	57.05
4	University degree or higher	121	25.10
IV	Job	482	100
1	Service	244	50.62
2	Businessman	67	13.90
3	Self-employed	38	7.88
4	Student	126	26.14
5	Housewife	7	1.45
V	Personal income 1 year (USD)	482	100
1	Under 1,000	52	10.79
2	1,000 - 3,000 won	94	19.50
3	3,000-5,000 won	127	26.35
4	Over 5,000	209	43.36
VI	Frequency of online shopping 1 year	482	100
1	Less than 3 times	39	8.09
2	4-5 times	72	14.94
3	6-8 times	57	11.83
4	9-10 times	83	17.22
5	More than 10 times	231	47.93
VII	Personal perception of AI impacts on electronic product satisfaction	482	100
1	Correct	448	92.95
2	Wrong	34	7.05
VIII	Online personalized electronic products shopping frequency (Per year)	482	100
1	Newer	73	15.15
2	Hardly once or twice	216	44.81
3	Sometimes	88	18.26
4	Often	57	11.83
5	regularly	48	9.96

(Source: Author's survey and calculation results in 2023)

The results of descriptive statistics for the general data are summarized in Table 1. With the above results showing that consumer satisfaction with artificial intelligence marketing services in the electronic field is quite high, most of the factors affecting customer satisfaction are rated at a low level rather high “Agree” (mean value > 3.5).

Table 2: Survey results of the average rating of observed variables

Observed variables	AIM	INFO	ATT	WCC	CS
Degree evaluation	3.83	3.82	3.67	3.51	3.69

6.2. Assess the reliability of the scale using Cronbach's Alpha coefficient

The results of the reliability test by Cronbach's Alpha coefficient show that: 36/36 observed variables of the components and factors are correlated with the total variable greater than 0.3; Cronbach's Alpha coefficient is greater than 0.6. Thus, it can be concluded that: the reliability of the scales used in the model ensures the allowed reliability (Cronbach, 1951; Nunnally and Bernstein, 1994).

6.3. Exploratory factor analysis (EFA)

The scale after 2 times of analyzing observed variables with factor Loading coefficients less than 0.5, respectively, was excluded from the model, the excluded variables include WCC7, WCC8, and ATT7. The final EFA analysis results have KMO = 0.968 (showing that EFA factor analysis is appropriate - According to Hair et al, 1998); Sig = 0.000 (showing that the observed variables are correlated with each other in the population); total variance extracted 78.051% said that the extracted factors explained 78.051% variation of the data. EFA factor results also extracted 5 factors from the remaining 33 observed variables (after removing 3 variables that did not satisfy the requirements), in which there was no disturbance of observed variables compared to the initial assumption of the study fabricate. Thus, the scale meets the requirements and is ready to conduct CFA confirmatory factor analysis.

Table 3: Results of KMO and Bartlett

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy,		.968
Bartlett's Test of Sphericity	Approx. Chi-Square	17,387,329
	DF	528
	Sig.	.000

(Source: Author's survey and calculation results in 2023)

Table 4: Total Explanatory Variance

Total Variance Explained									
Components	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% Variance	of Cumulative %	Total	% Variance	of Cumulative %	Total	% Variance	of Cumulative %
1	19,027	57,657	57,657	19,027	57,657	57,657	6,086	18,441	18,441
2	2,393	7,253	64,910	2,393	7,253	64,910	5,787	17,538	35,979
3	1,804	5,466	70,375	1,804	5,466	70,375	5,594	16,952	52,931
4	1,458	4,417	74,792	1,458	4,417	74,792	4,286	12,986	65,918
5	1,076	3,259	78,051	1,076	3,259	78,051	4,004	12,134	78,051

(Source: Author's survey and calculation results in 2023)

6.4. Confirmatory factor analysis (CFA)

Carrying out confirmatory factor analysis, the model fit indicators are obtained in Figure 2 and table. The results in Table 3 show that all the evaluation indicators satisfy the conditions. Thus, it can be concluded that the model fits the research data and achieves monadism.

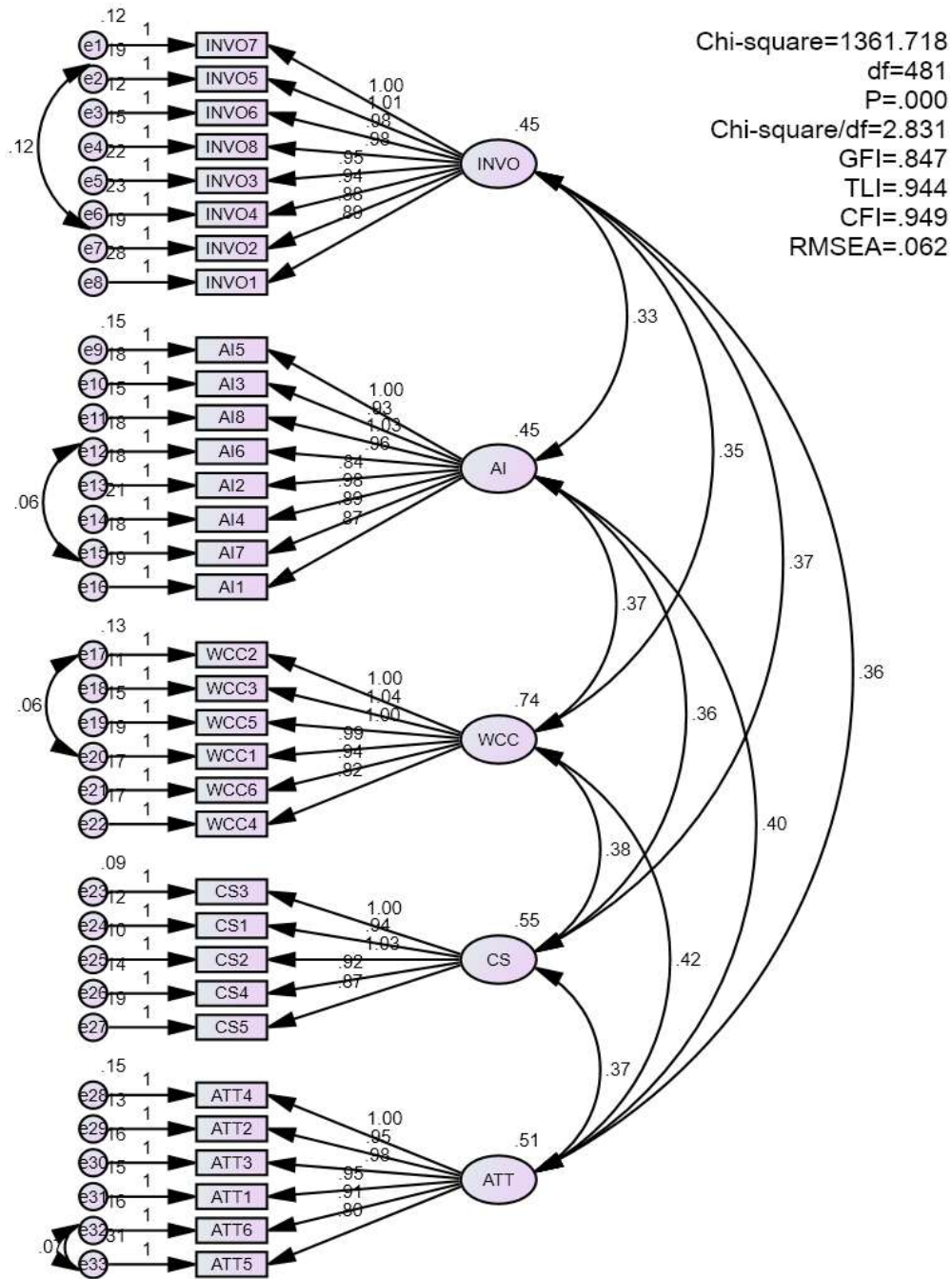
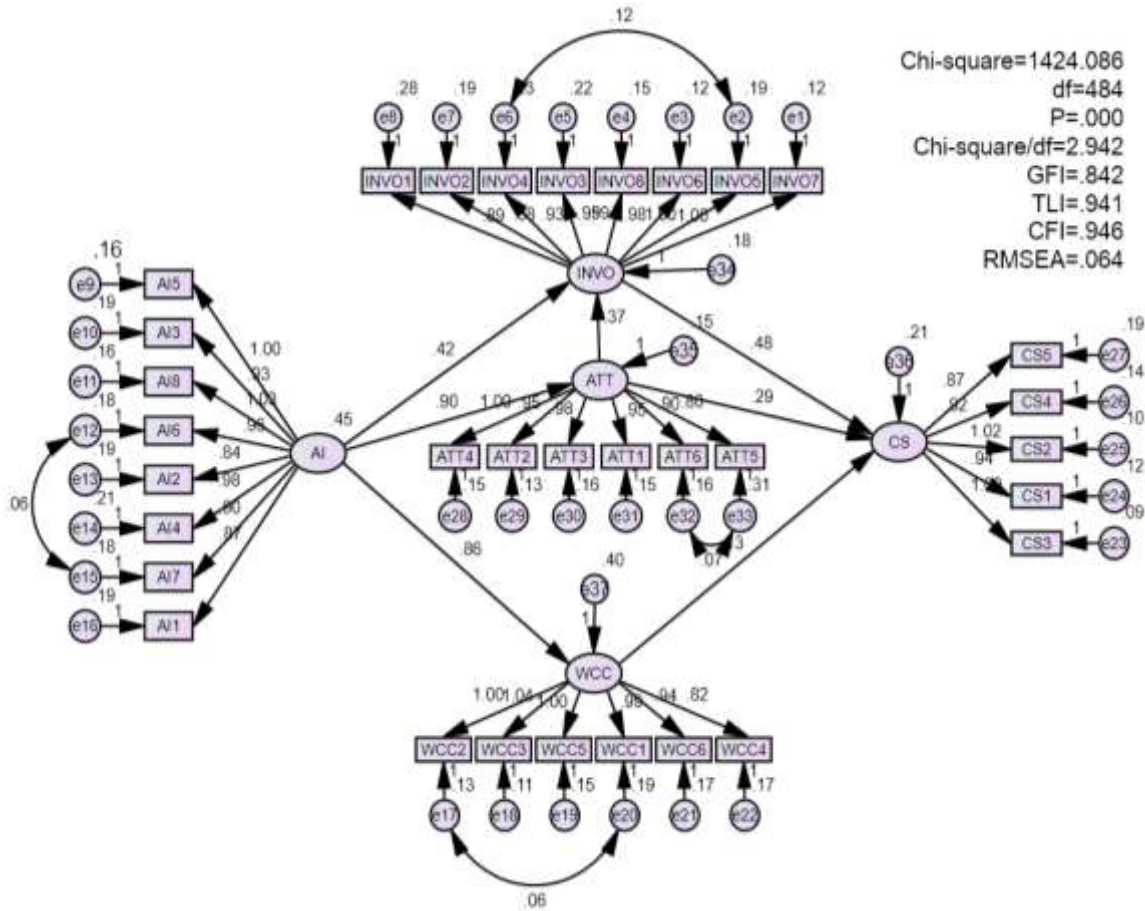


Fig 2: Result of confirmatory factor analysis CFA
 (Source: Author's survey and calculation results in 2023)

No	Index	Result	Request	Basis
1	CMIN/df		< 3	Kettinger and Lee, 1995
2	CMIN/df	2.831	< 5	Kettinger and Lee, 1995
3	CFI	0.949	0.9	Baumgartner and Homburg, 1996
4	TAG	0.934	0.9	Baumgartner and Homburg, 1996
5	RMSEA	0.062	< 0.08	James H. Steiger, 1990
6	GFI	0.847	0.8	Baumgartner and Homburg, 1996

6.5 SEM Linear Structure Analysis



After analyzing the CFA, the SEM linear structural model was performed to determine the influencing factors and the degree of influence of each factor on customer satisfaction with marketing services Artificial Intelligence in the field of marketing electric sector. SEM analysis is conducted to analyze starting from the original proposed research model, then proceed to calibrate the model to get a better model. Performing estimation of the research model by linear structural model, the results are shown in Figure 3.

Fig 3: Result of Linear Structure Analysis (SEM)

The results of SEM linear structure analysis in Figure 2, show that: the model is suitable for the research data because Chi-square/pdf = 2.942 < 5; TLI = 0.941 > 0.9; CFI = 0.946 > 0.9; RMSEA = 0.064 < 0.08 (Browne and Cudek, 1992; Kettinger and Lee, 1995).

Table 6: Unnormalized weights and normalized SEM analysis

Correlation	Wish quantity	Error standard	Value due	P-value	Coefficient standardized
ATT AI	0.904	0.044	20,391	0.000	0.840
INVO ATT	0.365	0.064	5,738	0.000	0.391
INVO AI	0.420	0.069	6,122	0.000	0.418
WCC AI	0.863	0.054	15,941	0.000	0.671
CS INTO	0.482	0.057	8,444	0.000	0.441
CS ATT	0.292	0.055	5,280	0.000	0.286
CS WCC	0.134	0.034	3,982	0.000	0.157

(Source: Author's survey and calculation results in 2023)

So, The linear structural model in this case is suitable and reliable. From the model testing results in Table 6, it is shown that the factors affecting customer satisfaction with AI Marketing services in the electronic sector include: Customer participation (INVO), Thai Customer satisfaction (ATT), Willingness to co-create (WCC), both positively affect satisfaction with electronic

products in Hai Phong city with 95% confidence (since P-value < 0.05); in which all 3 factors: Customer Engagement (INVO), Customer Attitude (ATT), Willingness to co-create (WCC) are influenced by Marketing AI services. In addition, Customer Engagement (INVO) is also influenced by the customer acquisition factor (ATT). Thus, hypotheses H1, H2, H3, H4, H5, H6, H7 above are accepted.

6.6. Testing the difference of individual characteristics to the satisfaction of electronic products in Hai Phong city

Gender difference: The study used T-test to test, test results: Sig value of F test equals 0.312 > 0.05; the Sig t-test is 0.660 > 0.05. The above results show that there is no average difference in satisfaction for Marketing AI services in the field of electronics between men and women.

Table 7: Result of independent variable

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	DF	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
F_CS	Equal variances assumed	1.025	,312	,660	480	,510	,04449	,06745	-,08804	,17702
	Equal variances not assumed			,670	421.518	,503	,04449	,06642	-,08607	,17505

(Source: Author's survey and calculation results in 2023)

Table 8: Grouping results

Group Statistics					
	Gender	Women	Mean	Std. Deviation	Std. Error Mean
F_CS	1	189	3.7196	,69150	,05030
	2	293	3.6751	,74252	,04338

(Source: Author's survey and calculation results in 2023)

Differences in age, occupation, and income level: n studies use Levene, Welch, and F tests to test. The test results are as follows:

age: The sig value of the Levene test (0.238) is greater than 0.05 and the F test (0.215) is also greater than 0.05. The results show that there is no average difference in satisfaction with Marketing AI services between people of different ages.

About n career tests: The sig value of the Levene test (0.041) is less than 0.05 and the Welch test (0.932) is greater than 0.05. The results show that there is no average difference in satisfaction with Marketing AI services between people with different Occupations.

Regarding the level of income: The sig value of the Levene test (0.642) is greater than 0.05 and the F test (0.217) is also greater than 0.05. The results show that there is no average difference in satisfaction with Marketing AI services between people with different income levels.

7. Discussing research results

According to the results of data analysis, four factors have been used to show the intention to accept that affect the satisfaction of electronic products in Hai Phong City, which are AI Marketing intelligence, innovation, participation, co-creation, and customer attitudes. Various relationships, hypothesized in the conceptual model, have been tested and the results are as follows: if a business uses AIM, it will generate customer innovation for electronic products and co-creation participation in electronic product innovation in Hai Phong City. The relationship between AIM and customers' attitudes towards electronic products tends to be more positive. It implies that, if customers have an attitude of actively participating in the quality of electronic products, they will have more satisfaction with future electronic products. Furthermore, the findings indicate that there is a positive correlation between innovation and willingness to co-create on Hai Phong cityese electronic product satisfaction, which implies that if an individual has a of innovation, there is a high tendency for a person to co-create personalized solutions leading to positive adoption intentions, the more satisfied they will be with the electronic products they will choose. Another finding of the study is that attitude has a significant relationship with innovation engagement in electronic products. It implies that the individual's attitude may be related to personalization, but the attitude will not directly affect the intention to apply for co-creation personalization. Mainly because a person will have the intention to shop for an electronic product when they engage in the personalization process and develop the confidence to intend to

shop. Similarly, subjective indicators also have a positive relationship with customer participation. If a person is not involved in the personalization process, he or she will not demonstrate an intention to apply for personalization through co-creation.

This study contributes to the understanding of the role of AIM in engaging customers to develop innovative services based on interest and purchase electronic products. This has been largely overlooked in previous studies. This research will benefit companies that are trying to use AIM to collect customer information in co-creating innovative services with customers and offering personalized services that are promising better be accepted by customers and intend to use electronic items, thereby improving the business efficiency of electronic products, and the products will reach customers in the fastest and most effective way. From the company's point of view, the customer emerges as an important aspect and plays an active role in the creation of innovative services. Therefore, this study also appreciates how customers can understand their expectations and requirements through customer engagement and co-creation of electronic services. The research contributes empirically to the discussion attesting to the role of customers and businesses in customer engagement in AI Marketing electronic and creating customer-centric innovation services and satisfaction with electronic products in Hai Phong City is the core element of customer service.

8. Conclusion

The objective of this study is to provide a theoretical basis and a practical survey on the influence of AIM on customer satisfaction with electronic products in Hai Phong City. The authors confirm that customer co-creation of innovative service solutions is influenced by customer digitalization and is driven by customer innovation, attitude, willingness to co-create, and participation. Our research is the basis for forming the concept of co-creation of service innovation solutions in the electronic industry. The electronic industry can provide healthy, creative, and superior services when the services/products are being co-created with customer engagement and innovation, thus achieving effective management inventory management and balancing supply and demand with sales and performance. This study explores how customers can co-create with companies and what companies should do in providing personalized services. This will add to our understanding of how companies can apply technology to increase the likelihood of customer adoption of innovative services. In this study, customers play an important role in creating innovative services as they are integrated as active partners through the application of AIM to collect customer information customers for electronic businesses to offer the most satisfactory products, satisfaction is the highest for Hai Phong City electronic products and services.

Reference

1. Alex Krizhevsky et al (2012), ImageNet Classification with Deep Convolutional Neural Networks. *Neural Information Processing Systems* 25 (January 2012). <https://doi.org/10.1145/3065386>.
2. Nguyen Thi Que Anh et al (2019), *Artificial intelligence with the law and human rights*, Judicial Publishing House.
3. Bagdoniene, L and Valkauskiene, G, (2016), Strategic Matters of the Customer CoCreation in Service Innovation, Tiziana Russo-Spena and Cristina Mele, p.972.
4. Cahier Vacances (2018), Larousse Dictionary, Grand Dictionnaire universel du.
5. Cappetta, R, Cillo, P, & Ponti, A (2006). Convergent designs in fine electronics: An evolutionary model for stylistic innovation. *Research Policy* , 35(9), 1273–1290
6. Christian Szegedy, et al, (2015), Going deeper with convolutions. *The IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 1-9 <https://doi.org/10.1109/CVPR.2015.7298594>.
7. Geetika Jain et al. (2021), Hyper-personalization, co-creation, digital clienteling and transformation, *Journal of Business Research*, Vol 124 (2021) 12-23.
8. Heidenreich, S., & Handrich, M, (2015), Adoption of technology-based services: The role of customers' willingness to co-create, *Journal of Service Management*, 26(1), 44-71.
9. Le Thuy Huong, Pham Thi Huyen et al (2023), Impact of artificial intelligence to marketing in the electronic industry in Hai Phong city, *Special Education*, Vol 43, No1, 2023.
10. Ken Chatfield, Karen Simonyan, Andrea Vedaldi, and Andrew Zisserman (2014), Return of the Devil in the Details: Delving Deep into Convolutional Nets. *BMVC 2014 - Proceedings of the British Machine Vision Conference 2014 (May 2014)*. <https://doi.org/10.5244/C.28.6>
11. Mike Easey (2009), *Electronic Marketing*, A John Wiley & Sons, Ltd, Publication.
12. O. Yastrebov (2018), Legal Status of Artificial Intelligence Across Countries: Legislation on the Move, *European Research Studies Journal*, XXI(4), pp 773-782;
13. Nguyen Van Quan (2019), Some impacts of artificial intelligence on the legal profession, *Journal of Legislative Research* No. 12 (388), June 2019.
14. Rogers, E, 2003. *Diffusion of innovations*. Fifth edition. Free Press: New York.

15. Sahin, I (2006). A detailed review of Rogers' diffusion of innovations theory and educational technology-related studies based on Rogers' theory. *Turkish Online Journal of Educational Technology-TOJET*, 5(2), 14-23.
16. Tong He and Yang Hu (2018), *ElectronicNet: Personalized Outfit Recommendation with Deep Neural Network*.
17. Tony Hines and Margaret Bruce (2007), *Electronic Marketing Contemporary Issues*, Butterworth-Heinemann is an imprint of Elsevier.
18. Valentina Barucci (2020), *The open economy changes the form, distribution, and quality of jobs in Hai Phong City*, ILO Hai Phong City.
19. WIPO (2019), *Technology Trends 2019 - Artificial Intelligence*, WIPO World Intellectual Organization.
20. Yann Lecun, et al (1998), *Gradient-Based Learning Applied to Document Recognition*. *Proc. IEEE* 86 (12 1998), 2278 - 2324. <https://doi.org/10.1109/5.726791>.