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Technology Used in Influencing Young Customers' Decision to Purchase Apartments in Ho Chi Minh City, Vietnam

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Abstract
Technology is an essential trend in all business industries, not only small businesses but also large businesses, especially in real estate trading for younger customers. Technological factors are pointed out to help customers quickly identify legal issues, prices, the surrounding living environment, or the investor's image to make the best purchase decision. This research aims to assess the impact factors of technology on the decision to buy apartments in Ho Chi Minh City people, including (1) Convenience in technology, (2) Transparency in technology, (3) Choice flexibility in technology, and (4) Interaction in technology. From the survey results obtained by 300 people owning apartments in Ho Chi Minh City, the author also proposes some managerial implications to enhance real estate businesses companies in applying the technology in sales distribution more efficiently and profitably.

Keywords: Technology, Young customers' decision, Apartment in HCM.

1. Background

Technology (Tech) can be considered a critical component in today's business environment, as it aids companies in cost-saving, productivity enhancement, flexibility, work quality, and organizational innovation (Albertin & Moura, 2002). This is especially true in the real estate sector, an industry traditionally resistant to digital integration in its buying and selling processes (Realtimes.vn, 2022). However, in recent years, we have witnessed the rapid emergence and development of "real estate technology" globally (Andrii Horiachko, 2022). According to Newzoo's statistics, at the end of 2021, there were 66.9 million smartphone users in Vietnam, with an estimated 57-60 million users engaging in online shopping through smart devices in 2022 (Vietnam E-commerce White Book, 2022). Notably, over 80% of property buyers utilize online channels as their primary source of information to explore market prices, projects, locations, living environments, and legal aspects when making decisions about real estate purchases.

Presently, modern customers can easily apply high technologies in reality such as Augmented Reality (AR), Virtual Reality (VR), and intelligent software to search for real estate properties proactively. They can quickly access information about legal aspects, pricing, surrounding environments, or images of property developers, all without the wait associated with customer advisory services. Moreover, the foundation of online marketing and sales resolves many information-related challenges for customers, offering them proactive and efficient access to product details (Vietnam E-commerce White Book, 2022).

Numerous studies worldwide have delved into the impacts of technology applications on the real estate business. According to Alcabaza and colleagues (2019), Virtual Reality (VR) and Artificial Intelligence (AI) have facilitated efficient experiences for customers in terms of residency, providing a realistic 360-degree observational perspective of real estate properties. This innovation empowers customers to proactively and conveniently examine properties of interest without extensive need for travel. Another advantage of AI technology in real estate is its capability to provide personalized services that cater to customers' preferences. For instance, it offers suitable property recommendations and virtual tours based on customers' past searches and preferences. Furthermore, it assists companies in automating repetitive tasks such as property inspections and displays, thereby saving time and money for agents and clients (Treleaven et al., 2021).

Importantly, Akindele et al., (2021) demonstrate that the Internet of Things (IoT) technology positively influences both real estate investors and consumers in the current era of Industry 4.0. Specifically, IoT systems are becoming an integral part of buildings by installing a growing number of sensor systems. This facilitates intelligent and rapid building management for businesses. In addition, IoT-enabled smart home devices empower consumers to control household items

like turning on a light or closing a door using voice commands or a simple touch on intelligent control devices such as mobile phones or tablets. Overall, real estate enterprises harness technology to enhance the efficiency of transaction processes for all stakeholders (Zhu & Lizieri, 2022).

In conclusion, the robust development of technology-driven real estate and its highly positive impacts on consumer purchasing decisions have garnered significant attention from researchers worldwide. However, in Vietnam, these studies have yet to extensively explore the potential of technology applications for property purchases in general and specifically for the housing sector. Consequently, the author intends to investigate " **Technology Used In Influencing Young Customers' Decision To Purchase Apartments In Ho Chi Minh City, Vietnam**" to expectedly identify the technology-related factors that most significantly influence the real estate market. The aim is to propose strategies for technological advancement that can attract and instill trust among all customers.

2. Literature Review and Methods Research

2.1 Literature review

2.1.1 Purchasing decision-making process

Kotler & Keller (2012) have clearly elucidated that making a purchase decision pertains to the process by which individuals, groups, or organizations make choices, acquire, and utilize goods, services, concepts, and encounters to fulfill their wants and necessities. A range of diverse elements impact consumers' decisions when making purchases. Making a purchase decision entails selecting from multiple choices, implying that having more than one option available is crucial for reaching a decision (Kotler & Keller, 2012). In simpler terms, a purchase decision is strongly influenced by various factors and constitutes an intricate process (Mirabi et al., 2015).

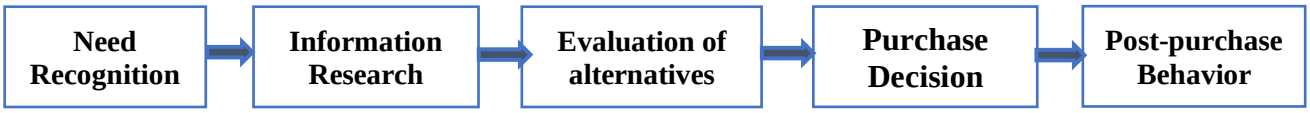

Figure 1. Purchase decision process (Kotler, 2012)

The consumer purchase decision-making process consists of five stages: **Need recognition, searching for information, evaluating alternatives, purchase decision, and post-purchase behavior**. It indicates how a consumer begins to contemplate before purchasing a product. Buyers may utilize all five stages in the decision-making process to guide toward a product. Perhaps buyers may skip one or more stages, entirely depending on the consumer's mindset (Kotler et al., 2017, p. 155).

Berkowitz (2018) asserts that the purchase decision is the stage through which a buyer selects products and services to buy. The purchase decision also involves various choices consumers make before and during the buying process. While making a purchase, consumers decide to buy a particular product when it aligns with their needs. Factors such as the point of purchase, desired brand, product design, quantity needed, timing of purchase, price, and payment method influence their decision (Hanaysha, 2018).

2.1.2 Real Estate Purchasing Decision.

Customers always evaluate several alternative options and select the one that suits them the most. Prominent qualities and features of real estate play a significant role when making these choices (Chia, et al., 2016).

Indeed, purchasing real estate is highly considered complex, requiring extensive interaction with the goods to identify the most suitable match (Kumar & Khandelwal, 2018). Since most consumers do not frequently buy and sell real estate, they tend not to rely solely on internal searches when making purchasing decisions. Real estate is really a high-value commodity, so consumers consistently strive to make the best decision by seeking expertise in this field. Additionally, they gather information through personal research and gather data from media, intermediaries, and, most importantly, from family and friends before making a real estate purchase decision (Kumar & Khandelwal, 2018).

2.1.3 The Concept of Property Technology

The concept of "Property Technology (PropTech)" was succesfully developed in 2017 at the University of Oxford, United Kingdom. PropTech has become a part of the real estate industry's digital transformation process, leading the market toward an entirely new approach to buying, operating, and managing properties. Specifically, real estate companies have utilized PropTech to enhance customer experiences, boost sales figures, and increase the efficiency of experiential activities and purchases.

Siniak et al., (2019) have outlined the latest types of information technology platforms applicable in real estate businesses, such as listing and searching; marketplaces; data, valuation, and analysis; asset and building management; rental management software; real and virtual viewing (3D/VR/AR/Images); technology-assisted brokerage; smart buildings & IoT; Big Data; artificial intelligence (AI); smart cities; BIM technology; sales and marketing. An example of government requirements, like economic growth, ethical examination, standards, policy enforcement, private issues, and information security, can be managed through IoT, Big Data, and cloud to shape positive user perceptions, enhancing their trust in technology (Ghouri & Mani, 2019).

These technologies are efforts toward smart real estate and can potentially enable property users or service consumers to make purchasing decisions (Tupikovskaja-Omovie & Tyler, 2020). They can also address the needs of stakeholders, including consumers, agents, government and regulatory bodies, and other related industries.

2.1.4 Technology Acceptance Model (TAM)

This research certainly employed the Technology Acceptance Model (TAM) as the foundational framework due to its significant and influential role in elucidating patterns of technology utilization (Fred et al., 1989 & Almaiah, 2022). TAM asserts that the inclination to use technology, termed as the propensity to adopt technology, can be gauged through a user's perspective on employing technology. Two critical predictors of this perspective regarding usage have been suggested: perceived utility and simplicity. The former pertains to an individual's belief that technology usage enhances task performance, while the latter characterizes the individual's perception that technology adoption requires minimal effort. Moreover, the perception of ease indirectly impacts attitudes toward perceived usefulness.

2.2 Research Methods

2.2.1 Model research

Based on previous research and the theories mentioned above, the author confidently proposed a research model of 04 factors affecting the impact of technology on increasing the decision to buy apartments of Ho Chi Minh City residents, including **Convenience in technology, Transparency in technology, Choice flexibility in technology, and Interaction in technology.**

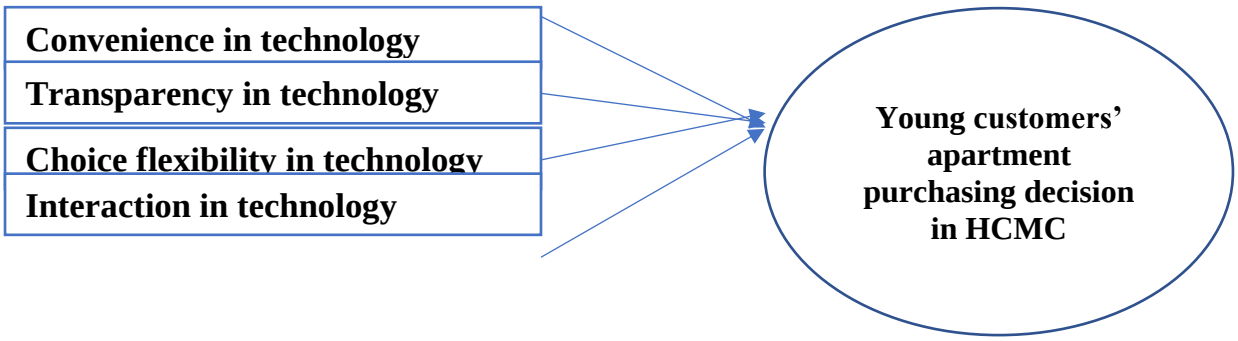

Figure 2. The author's proposed research model

Convenience in technology

Convenience is highly demonstrated through the ease of access and examination of a substantial amount of real estate data and the utilization of technology to make more informed decisions (DeLisle et al., 2020). An instance of Building Information Modeling (BIM) technology would generate a virtual replica of any given high-rise building. It allows for "seamless data exchange between the physical and virtual worlds, enabling convenient means for monitoring, understanding, and optimizing the functionalities of all physical entities" (El Saddik, 2018, p. 87), thereby providing customers with a more realistic view when observing a project, particularly a future-formed apartment. Additionally, 3D, VR, or AR technologies enable buyers to explore every nook and cranny of the apartment they are interested in, experiencing it as though it were a real home even while making purchasing decisions from the comfort of their own homes (Adapted from Alcabaza et al., 2019).

Transparency in technology

The main advantages of technology include high data quality, transparent relationships among participants, faster transactions, lower transaction costs, and increased market liquidity (Baum, 2017). Indeed, some researchers believe applying PropTech technology tools for greater transparency is an inevitable trend in the real estate industry's future (Ionașcu et al., 2020).

Overall, technology will transform offline market exploration processes into an online environment. In this way, the supply and demand of real estate will have more precise and more specific information. Real estate projects implementing blockchain technology aim to enhance the efficiency and transparency of ownership transfer registration. In the Vietnamese market, applying these technologies will help consumers feel more trust and assurance, as they can proactively verify legal documentation and the project's safe location, thereby avoiding fraudulent projects. Simultaneously, these technologies will empower customers to comfortably make decision to make purchasing on any product (Adapted from sources).

Choice flexibility in technology

The reality stemming from technology demonstrates that this extensive database platform enables customers to search various sources of information such as audio, video, images, social networks, reviews, and other services in seconds (Zikopoulos & colleagues, 2011). Subsequently, they proceed with the comparison step, selecting the most suitable products for themselves. Especially following the Covid-19 pandemic, consumer shopping behavior has shifted; customers prefer shopping from home through smart devices (Pantano et al., 2020). That shift will give rise to numerous choices in their needs; they can simultaneously view multiple projects and products online for reference.

Interaction in technology

Artificial Intelligence (AI) technology is capable of analyzing vast amounts of data and providing detailed information about property values, market trends, and customer preferences (Pinter & colleagues, 2020). Through pre-programmed scenarios, chatbots can engage in conversations with customers, like interacting with a consulting expert, sending relevant documents to customers, and gathering customer information (Alsawan & colleagues, 2023). In the real estate market, customers or individual investors can directly engage and interact through technology applications related to property management offered by property developers and building management (Alsawan & colleagues, 2023).

2.2.2 Research Methods

The qualitative research process was conducted by conducting a literature review to formulate hypotheses and propose a research model. Based on this qualitative study, a questionnaire was developed and utilized for the research. The subjects of the survey were residents who own apartments in the area of Ho Chi Minh City. The sampling method was conveniently chosen through direct interviews and indirect data collection via Google Forms. In total, 330 survey questionnaires were distributed, resulting in 300 valid responses collected.

3. Results and Discussion

The survey results and data analysis from over 300 individuals, aged 25 to 45, who own at least one apartment in Ho Chi Minh city, **Convenience in technology** is the most influential factor. The **interaction in technology** when

purchasing an apartment through technological platforms is ranked second. Following that, **Choice flexibility in technology** and **transparency in technology** have impacts on their apartment purchase decisions.

From the results of the regression analysis, the equation obtained is as follows:

Young customers' apartment purchasing decision in HCMC= 0.387*Convenience in technology + 0.213* Interaction in technology + 0.179* Choice flexibility in technology + 0.149* Transparency in technology.

Table 1. Influence level of variables

No	Factor	Beta	Influence level
1	**Convenience in technology**	0.387	1
2	**Transparency in technology**	0.149	4
3	**Choice's flexibility in technology**	0.179	3
4	**Interaction in technology**	0.213	2

(Source: Analyzed by the author)

With a Beta coefficient of 0.387, we have observed that the Convenience in technology factor has the most decisive impact on citizens in Ho Chi Minh City when making apartment purchase decisions. That result is easily understandable as complex real estate transactions, particularly the real estate business process, have been resolved more swiftly, saving time and costs for buyers (Apanasevic et al., 2016).

In the second place, with a Beta coefficient of 0.213, is the satisfaction of citizens with the high level of interaction in technology when making housing purchase decisions. Loureiro (2018) has also indicated that technologies like VR, dynamic images, and 360-degree views (Willems et al., 2019) significantly contribute to real estate buyers. They provide Convenience in observing properties, architectural designs, and future living environments. Current real estate businesses' batch chatbot technologies positively impact the interaction between customers and developers. Specifically, it can support automated messaging, chatting, consulting, and personalized care through predefined voice and button options (Rajnerowicz, 2021).

Real estate businesses are utilizing platforms like Artificial Intelligence (AI) and Big Data to enhance their ability to provide personalized and customer-centric services (Miljkovic, 2023). The criterion of technology-choice flexibility is evaluated as the third-ranking factor with a Beta coefficient of 0.179. This factor will provide consumers with a more comprehensive and cautious perspective when purchasing any products, and for real estate, it will empower buyers to actively seek and select relevant properties, ultimately meeting their specific needs.

Occupying the last position in the research model with a Beta coefficient of 0.145, transparency role in real estate technology has garnered significant consumer interest. Specifically, according to Spielman (2016), intelligent technology allows property buyers to access government agency websites to research and verify the legal status of projects and even detect potential corruption in real estate transactions. Moreover, the utilization of digital contracts and blockchain technology can enhance transparency in real estate transactions, reducing transaction costs by minimizing verification times for involved parties. Additionally, this enhancement is expected to improve the liquidity of the real estate market (Dijkstra, 2017).

4. Recommendations

With the increasing housing demand among the general population in Vietnam and specifically in Ho Chi Minh City, various opportunities and challenges have emerged for real estate businesses. Beyond factors influencing the decision to purchase real estate, such as price, project legality, favorable location, or quality of living environment, technology has become a pivotal factor in consumers' decision-making process when buying real estate, especially apartments. Due to the Convenience and uniqueness of an apartment, the technological aspect cannot be separated when customers make their purchasing choices. Therefore, meeting the diverse demands of young customers these days requires

real estate businesses, investors, and distributors to incorporate modern technological applications into their management, advisory, and customer care frameworks to enhance customers' purchasing decisions.

Alongside the researched data, the author proposes the following recommendations to real estate businesses:

- **Convenience in technology:** Suppliers must create user-friendly application interfaces to ensure that users can easily navigate through applications that support information search and real estate transactions without requiring any assistance. Convenience can be achieved by designing a simple and comprehensible application with logically organized and clearly labeled functionality buttons. The notification messages should also be written in easily understandable language, which is a crucial aspect to consider.

- **Transparency in technology:** To enhance the young consumer's real estate purchasing decision-making process. Investors and distributors must provide comprehensive project legal documents and assurances of transparency on a technology platform. This enables customers to quickly verify information before making decisions. For instance, when examining details about a specific project, users can proactively view and download legal documents, project design images, and related files without additional support staff, as is the case currently. Additionally, technology that verifies safe geographical locations (areas not violating urban planning, with good living conditions, dense population, and high social status) is also attractive to foster trust among current real estate buyers.

- **Choice flexibility in technology:** Real estate businesses should apply big data technology to research and collect customer and product data. Distributors and developers need to continuously present various communication strategies for their products, targeting the right audience and appealing to the diverse needs of customers. If a company offers projects or apartment designs that cater to the various demands of different customer segments, it will secure a market share within the industry.

- **Interaction in technology:** Nowadays, thanks to modern technological tools like chatbots, social media, and various communication channels such as project websites, YouTube, Zalo OA, and Instagram, buyers can proactively interact and negotiate with property developers and real estate agents without the need for face-to-face meetings as before. Moreover, applications for managing residents, providing feedback, and ensuring building security should be seriously implemented to enhance residents' interaction and to ensure the best possible quality of living in high-rise buildings.

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