



Original Research Article

Consumers' Preference in Online Purchasing of Ornamental Plants in the Klang Valley, Malaysia

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Abstract: The internet's growth has opened doors for global sales, particularly in Malaysia, where a rising trend in online shopping is evident. Floriculture entrepreneurs are seizing this opportunity to boost ornamental plant sales online, driven by the increasing internet-savvy Malaysian customer base. Despite the overall surge in online commerce, ornamental plants face challenges in popularity compared to items like clothing or food. Various factors influence consumer preferences for online ornamental plant purchases, including plant pricing, quality attributes, and reliable delivery services. This study aims to explore the factors influencing consumers toward purchasing ornamental plants online, assess consumer preferences, and understand how these patterns may impact future buying behaviour. The conceptual framework includes five independent variables: price, quality, time-saving, convenience, and delivery service, with consumer preferences as the dependent variable. Data was collected from 154 respondents in Klang Valley, Malaysia, who were experienced in purchasing ornamental plants online, and analyzed using descriptive and mean ranking analysis. Findings show that the critical platforms for purchases were Facebook, Shopee, and WhatsApp, with seedlings and adult plants priced under RM 20 being the preferred choices. Respondents identified price, quality, time-saving, convenience, and delivery service as crucial factors in their online purchasing decisions. Delivery service emerged as the most influential factor, earning 100% preference. Consumers were firmly willing to buy ornamental plants online if informed about the seller's quality and packaging methods, as highlighted by a mean score of 4.533. The study emphasizes that consumers prioritize "quality delivery service" when making online purchases. "Convenience" is another critical factor, allowing consumers to compare prices before buying. Overall, consumers focus on price, quality, convenience, and time savings when buying ornamental plants online. Sellers are encouraged to go beyond these factors, employing diverse strategies to attract consumers to the online ornamental plant market.

Keywords: Consumers; Purchasing Preferences; Floriculture; Ornamental Plants

Received: 24th November 2023

Received in revised form: 12th December 2023

Available Online: 24th December 2023

Published: 31st December 2023

Citation: Man N, Mohd Tanos MM, and Kemat N. Consumers' preference in online purchasing of ornamental plants in the Klang Valley, Malaysia. *Malays J Agric Econ* 2023; 30(1): a0000436. <https://doi.org/10.36877/mjae.a0000436>

1. Introduction

1.1. Floriculture Industry

Floriculture, a specialized field within horticulture, involves the cultivation of a diverse array of plants, including flowering plants, decorative foliage plants, cacti, orchids, succulents, bonsai, ferns, container-grown plants, and landscape gardening (Larson, 1980), and segmented into four primary groups, namely cut flowers, cut foliage, pot plants (encompassing both pot flowers and pot greens), and bedding/garden plants (Xia *et al.*, 2006). Fueled by innovation, the floriculture industry is globally competitive and heightened interest in its financial magnitude has arisen due to the recent global economic slowdown. Economically, floriculture products, deemed non-essential, depend on consumer financial well-being for commercial success, with quality defined by visually appealing growth and postharvest preservation. Floricultural products, traded globally, play a vital role in the rural economies of some countries, and the heightened demand for flowers has transformed floriculture into a crucial high-tech commercial trade conducted within controlled environments like greenhouses (Rout & Das, 2022). The floriculture industry in Malaysia has evolved into a notable economic contributor, offering a fresh source of wealth and bolstering national income by capitalizing on the nation's diverse biodiversity and adaptable climate. As of 2018, the industry contributes over RM 500 million (equivalent to US\$119.1 million) annually through exports, creating more than 50,000 job opportunities. Aligned with the National Agrofood Policy (NAP), projections anticipate substantial growth, with floriculture exports expected to rise from RM 449 million (US\$106.9 million) in 2010 to a projected RM 857 million (US\$204.05 million) by 2020 (Ministry of Agriculture and Agro-based Industry, 2011). This underscores the sector's pivotal role in Malaysia's economic landscape and global market presence. Recognizing its importance, the government has implemented strategies, resulting in a steady growth rate with a projected compound annual growth rate (CAGR) of 3.1% from 2020 to 2021. Emphasizing increased production, the government aims to raise national flower production from 468 million cuttings in 2010 to an impressive 892 million cuttings or pots by 2020, reflecting a substantial annual growth rate of 6.2% and highlighting its commitment to fostering sustained success in the floriculture industry (Ministry of Agriculture and Agro-based Industry, 2011). Anticipated as a significant catalyst for Malaysia's floriculture industry, research and development activities were implemented to introduce new species and incorporate advanced floriculture technologies, aiming to create a competitive floriculture sector. The research and development activities include the development of innovative native and exotic varieties, geRM plasm collection, and improving the quality of floriculture products (Nik Rozana & Noorlidawati, 2016). Spearheaded by MARDI through the Horticulture Research Centre in alignment with the 11th Malaysian Plan (2016–2020), this developmental initiative focused on various aspects. These include adapting native and exotic species for ornamental and functional purposes, large-scale crop production, effective pest management, and eco-

friendly disease control. The initiative also aims to ensure quality preservation throughout post-harvest stages and evaluate market potential (Mohd Zaffrie *et al.*, 2020).

1.2. Online Marketing

Integral to any business, marketing holds significance beyond mere publicity or promotion, encompassing various facets within the marketing process. It extends to product manufacturing, pricing strategies, and distribution channels. The essence of marketing lies in recognizing and fulfilling human and social needs. According to Kotler and Armstrong (2001), marketing is a social and managerial process wherein individuals and groups attain their wants and desires by generating, exchanging, and evaluating products in collaboration with others. A crucial element for the success of any company, marketing necessitates the implementation of the right strategy, prompting marketing managers to concentrate on four key decision areas—product, price, place, and promotion (Kotler & Keller, 2006), with the widely adopted 4Ps mix marketing strategy standing out as a preferred choice among many companies. Online marketing is leveraging the internet and digital electronic technologies to accomplish marketing objectives, aiming to reach a diverse user base at their convenience (Chaffey *et al.*, 2009). Kotler and Armstrong (2012) conceptualize online marketing as a comprehensive strategy encompassing campaigns and activities designed to promote products services, and cultivate digital consumer relationships. Alvermann and Sanders (2019) posit online marketing as a means to precisely target and communicate with consumers, utilizing a tool considered unprecedented in its potency and intimacy. The advantages of online marketing include cost efficiency, flexibility, rapid information dissemination, and the potential for unparalleled global outreach, resulting in consequential business profitability. However, inherent disadvantages, such as the absence of personal contact and concerns regarding security and privacy, accompany the utilization of online marketing methodologies.

The rise of online marketing is closely tied to the increasing number of internet users. Over the past 25 years, people have gained widespread access to the Internet, leading to continuous expansion and innovation. Nowadays, many tasks, including online shopping, booking, research, and communication, can be done effortlessly through computers and phones. The graph below illustrates a substantial global increase in internet users since 1995 (Refer to Figure 1). Online marketing involves conducting business activities using the internet to convey information about a company's brand, products, or services to customers. The methods and techniques employed in online marketing encompass email, social media, display ads, websites, and Google. Due to its novelty, various definitions and interpretations exist, making it challenging to distinguish between online marketing and internet marketing. Online marketing is sometimes interchangeably referred to as “Online Advertising”, “Performance Marketing”, or “Search Engine Marketing”, although these terms do not carry the same meaning (Lammenet, 2014). In contrast, internet marketing specifically employs target-oriented Internet tools such as the World Wide Web (WWW) or email, with the Internet site serving as the primary platform (Naik & Raman, 2003).

The surge in internet usage has yielded favourable outcomes for diverse marketing sectors, notably impacting the agricultural industry. As the Internet continues to expand, farmers have gained various avenues to market and sell their products (Strzębicki, 2015). Despite numerous hurdles, agricultural producers are actively developing these internet-based marketing channels. The Internet serves as a direct platform for farmers to sell their products to consumers, transforming the traditional marketing channels within the agribusiness sector (Strzębicki, 2015). E-Marketing for agricultural products is an electronic commerce portal tailored to address several challenges farmers face. Additionally, integrating social media marketing, encompassing platforms such as Facebook, Instagram, Twitter, and others, has become instrumental in connecting with users fostering brand and product promotion, ultimately contributing to increased sales and enhanced website traffic (Nobre & Silva, 2014).

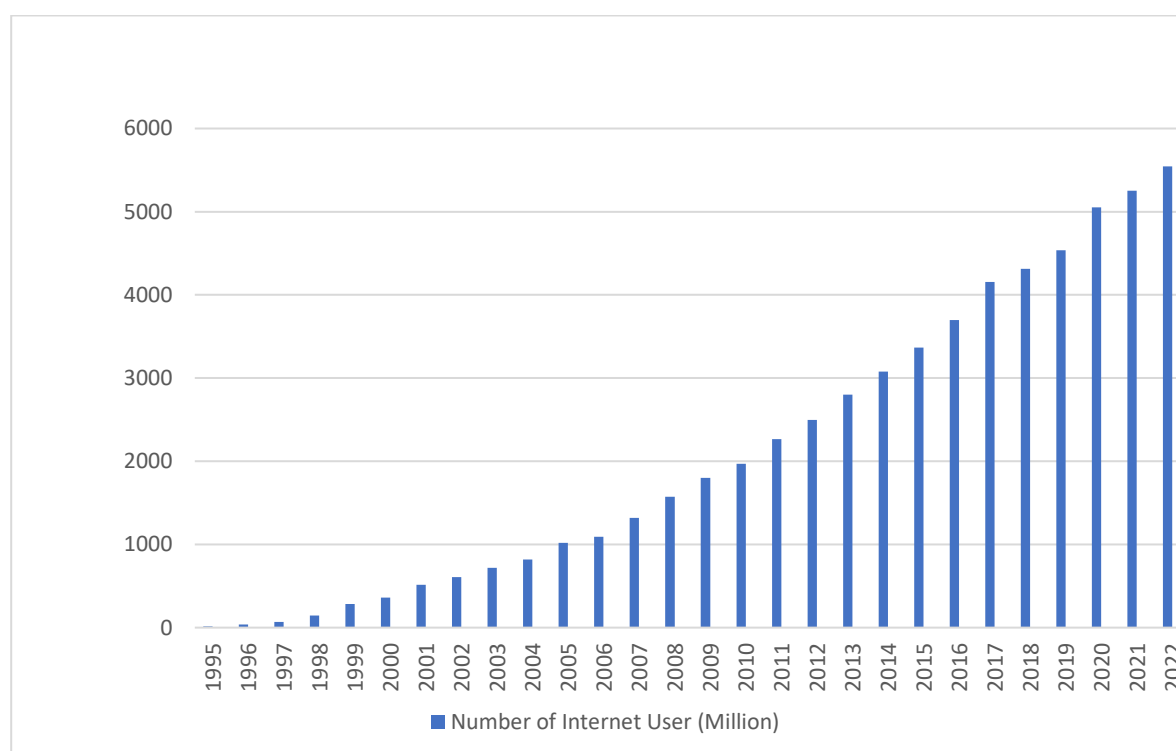


Figure 1. World Internet Usage Growth, 1995-2022 (Source: Miniwatts Marketing Group, 2023)

Nowadays, the offline market has been dominated by online marketplaces that promote or advertise products online. According to Young (2021), the global online shopping market is rapidly growing, approaching a size of nearly 4 trillion by 2020, with projections indicating an expectation of 300 million online shoppers in the US by 2023. Business leaders leveraging various online tools can unlock new opportunities, as emphasized (Gaikwad & Kate, 2016). Using the Internet as a marketing tool is a strategic approach business leaders employ to achieve financial success and enhance communication. Achieving maximum exposure from the organization to clients should be an essential marketing objective for a successful connection with potential customers (Gibson, 2018). The increasing robustness of

online sales visibility and social media advertising channels becomes pivotal for reaching diverse markets and expanding business (Bănică *et al.*, 2015). Unlike online marketing, offline marketing is considered more expensive regarding resources (Orzan, 2007) and can be intensive and time-consuming (Paşcalău & Urziceanu, 2020). Furthermore, offline marketing operates locally, confined by geographical limitations, while online marketing spans globally, breaking down communication barriers with internet accessibility worldwide. The advent of global websites with uniform versions for each country has significantly reduced the need for extensive local representation and service staff, allowing for more streamlined customer support often addressed through online channels across different countries (Paşcalău & Urziceanu, 2020).

However, offline marketing and online marketing are frequently combined. Some companies have strategically designed environments that foster a seamless collaboration between various marketing channels, effectively integrating online and offline mediums (de Haan *et al.*, 2016). This synergistic approach allows for a comprehensive and cohesive marketing strategy that capitalizes on the strengths of both online and offline platforms, catering to diverse audience preferences and maximizing the overall impact of their marketing initiatives. In such environments, the coordination between online and offline marketing efforts is carefully orchestrated to ensure a unified and consistent brand message across different channels, thereby enhancing the overall effectiveness of the company's promotional endeavours. Lieber and Syverson (2012) highlighted that a significant determinant influencing businesses' engagement in both offline and online markets is the extent of connectivity between these markets for the same product. This connectivity is multifaceted, encompassing aspects such as demand, supply, and the accessibility of strategic spaces for businesses.

Most farmers in Malaysia continue to engage in traditional agricultural practices, depending on intermediaries to distribute their products. This reliance stems from the constrained scale of their production and the impractical distance to urban customers, exacerbated by the absence of sufficient transportation and marketing networks (Nor Azlina & Abdul Rahman, 2014). This dependency is compounded by the mediators exploiting market prices, leading to farmers receiving diminished compensation for their products burdening consumers with elevated prices for their necessities. Therefore, the government has made several strategies to make Malaysia's agriculture an independent producer and net exporter of various agricultural products. In 2004, the Ministry of Agriculture and Food Industry (MAFI) had a strategy for Malaysia's agricultural sector. Among the main strategies is information and communication technology (ICT). The Ministry provides internet and computer facilities at agricultural stations owned and managed by all Department of Agriculture (Rozana, 2004). Hence, by utilizing these resources, farmers can market their agricultural products online. The strategic fusion of e-marketing and agriculture can bolster farmers' incomes by refining the structures of agriculture and rural economics, with the

introduction of agricultural e-marketing promising enhanced market access for small farmers to promote and sell their products effectively (Secinaro *et al.*, 2021).

1.3. Problem Statement and Objective of the Study

Malaysians are open to buying ornamental plants online, as the online marketing platform provides numerous advantages for the business. In contrast to conventional marketing methods, online marketing is often characterized by greater cost efficiency, attributed to the substantially lower capital requirements and the ability to promote products or services through cost-effective or free channels such as blogs and social media platforms (Orzan, 2007). Leveraging universally accessible internet, online marketing achieves a broader reach. Also, it reduces the need for extensive local representation and service staff through uniform global websites, streamlining customer support across different countries (Paşcalău & Urziceanu, 2020). Online marketing also enables sellers to promote products anytime, freeing them from the restrictions of traditional business hours and providing time flexibility. However, compared to other items, purchasing ornamental plants through online stores has limited popularity. While consumers acknowledge the convenience of purchasing ornamental plants online, they tend to favour physical stores for quality assessments and the tangible experience (Reyes & Navarra, 2022). The online purchasing of ornamental plants in Malaysia is experiencing gradual growth compared to other countries, and there is currently a scarcity of studies addressing consumer behaviour in buying ornamental plants through online platforms in Malaysia. This study explores the factors that influence consumers toward purchasing ornamental plants online, the preferences level of consumer on ornamental plant purchasing and how the purchasing will affect the consumer to buy the ornamental plants with online stores in the future. Therefore, the general objective of this study is to identify consumers' preferences for purchasing ornamental plants online among consumers in Klang Valley, Malaysia.

2. Literature Review

2.1. Consumer Preferences

Consumers, comprising individuals or groups such as students, parents, and employees, play a pivotal role in the market, seeking products or services for personal, social, family, and household needs. Their significance lies in driving revenue, as businesses rely on attracting and retaining consumers to sustain their existence. Business competition revolves around engaging consumers, involving strategies like aggressive advertising, price adjustments, and developing unique products and experiences that resonate with consumer preferences (Kenton, 2023). Consumer behaviour encompasses the intricate processes individuals or groups undergo in selecting, purchasing, using, or disposing of products, services, ideas, or experiences to fulfil their needs and desires (Solomon *et al.*, 2013). Recognizing that users represent a significant source of uncertainty from a corporate standpoint, systematic examination of consumer behaviour becomes imperative.

Comprehensive information about consumers and their behaviour is essential for strategic marketing planning, guiding decisions related to target market segments, product policies, pricing, distribution, and promotion. Understanding the determinants of internal and social consumer behaviour and cultural influences becomes crucial in effective market communication for businesses. Consumer choice reflects the individual subjective preferences of consumers, gauged by their satisfaction or utility derived from a purchased product. This satisfaction, often synonymous with utility, is crucial in understanding user value, with distinctions drawn based on how the utility compares across different items (Baumol, 2017). Consumers consider many factors when deciding on purchases, including taste, quality, price, cultural influences, educational aspects, and more. It is important to note that these factors are not equally weighted, and their significance can vary from one individual to another. Companies need to develop a thorough understanding and foresight into the diverse behaviours of consumers when it comes to acquiring various products and services to fulfil their unique needs (Hanaysha, 2018). Recognizing and comprehending consumer preferences is crucial not only because it shapes their choices but also because it provides companies with valuable insights into consumer demand. This information is instrumental in ensuring a company maintains an adequate product supply to meet demand and aids in determining optimal product pricing. As a result, consumer preferences become a significant factor influencing heightened marketing demand, even when prices are relatively higher. However, disregarding consumer preferences can shift the focus to price and availability as the primary determinants of successful sales.

2.2. Consumer Preferences Toward Online Shopping

Consumer preferences significantly shape online user behaviour, with a primary focus on the characteristics and orientation of Internet shoppers (Bellman *et al.*, 1999), their intentions when making online purchases (Vellido *et al.*, 2000), the perceived value of online shopping to consumers (Keeney, 1999), speculations regarding the most preferred product classes and attributes on the Internet (Kwak *et al.*, 2002), and consumer perceptions of various risks associated with online retailing (Bhatnagar *et al.*, 2000). The evaluation of value in various forms of Internet shopping prompts consumers to question how this appraisal influences their choices. Based on previous research on offline shopping, value assessments have positively impacted preferences, satisfaction, and loyalty (Cronin *et al.*, 2000). According to Mathwick *et al.* (2001), the issue of choice is particularly crucial in Internet shopping. Consumer preferences, essentially reflecting a buyer's choice of a specific Internet retailer, are influenced by utilitarian and hedonic values, which are found to have a direct and positive impact on choices for Internet retailers. This hypothesis supports various studies, including preliminary research by Jacoby and Kaplan (1972) and Kaplan *et al.* (1974). Consumers' future behaviour, encompassing their intentions, willingness to make purchases and word-of-mouth recommendations, is strongly influenced by their preferences (Bagozzi, 1992; Dodds *et al.*, 1991). While Fishbein and Stasson (1990) suggest that intention is a motivational factor, Bagozzi (1992) argues that choice is distinct from intention, emphasizing

that intention cannot be activated without a sense of priority. Hence, opting for Internet retailers positively shapes consumer intentions. This aligns with existing research that links the perception of value with the selection of retail stores and the significance of retail protection (Bolton & Drew, 1991; Dick & Basu, 1994; Mathwick *et al.*, 2001). Structural studies further connect consumer preferences with subsequent repurchase behaviour (Andreassen & Lindestad, 1998; Erdem & Swait, 1998; Pritchard *et al.*, 1999; Roest & Pieters, 1997).

2.3. Factors Influencing Consumer Behaviour

Consumer purchasing behaviour involves the buying patterns of end consumers, encompassing the entire process from selection and acquisition to the utilization of goods and services to meet their needs. According to Kotler and Armstrong (2012), the complexity of this behaviour is influenced by four factors: psychological, social, cultural, and personal, all of which interplay with economic considerations in shaping consumers' decisions.

2.3.1. Psychological factor

In consumer behaviour, psychological factors shape individuals' decisions and actions. Motivation, a key influencer, is the internal drive that propels human or consumer activities toward fulfilling needs or achieving specific goals (Kotler & Armstrong, 2012). Perception, another psychological factor, involves adapting reality through the selection, processing, and interpretation of input data from the environment, all tailored to serve a purpose (Brown, 2015). Learning, a gradually unfolding process influenced by consumer experiences, occurs as individuals make purchases, developing skills and knowledge conditionally or cognitively (Kotler & Armstrong, 2012). Additionally, beliefs, shaped through the learning process, encompass knowledge, opinions, or faith directed toward specific products or ideas. These beliefs may carry emotional significance or remain neutral, often influenced by overarching assumptions or fundamental understandings acquired throughout one's life (Kotler & Armstrong, 2012).

2.3.2. Social factors

Social factors are crucial in shaping consumer behaviour, encompassing various elements influencing individuals' purchasing decisions. As a significant social factor, the family holds substantial sway over an individual's buying behaviour. Early preferences often take root during childhood, as observations of family members making purchasing decisions leave a lasting impact. These influences persist into adulthood, guiding individuals towards products and brands familiar from their upbringing (Peter & Olson, 2010). Reference groups constitute another influential social factor, representing individuals a person associates with. These groups share common buying behaviours and exert mutual influence on each other's choices, contributing to shaping individual preferences (Solomon *et al.*, 2013). Roles and status within society also significantly impact buying behaviour. A person's societal role and status play a pivotal role in shaping purchasing decisions. Individuals in higher positions

often find their buying behaviour influenced by their status, reflecting the social dynamics contributing to consumer choices (Kotler & Armstrong, 2012).

2.3.3. Cultural factors

In the broader context of cultural influences on consumer behaviour, two specific factors, subculture and social class, play significant roles. Subcultures, which emerge within cultural groups, delineate segments characterized by shared beliefs and values among individuals from different religions, castes, geographies, and nationalities. These distinct subcultures form unique customer segments, influencing consumer preferences and behaviours in diverse ways (Kotler & ARM strong, 2012). Social class, another pivotal factor, extends beyond income considerations alone. It encompasses a broader spectrum of elements such as occupation, family background, education, and residence location. This multifaceted definition of social class proves crucial in predicting and understanding consumer behaviour. Individuals' social class affiliations contribute substantially to shaping their preferences, choices, and buying patterns, highlighting the intricate interplay between societal structures and consumer decision-making processes (Kotler & Armstrong, 2012). These cultural factors provide nuanced insights into the diverse and complex dynamics that shape consumer behaviour within broader cultural contexts.

2.3.4. Personal factors

Personal factors, intrinsic to an individual, influence consumer behaviour considerably. Age, a key determinant, shapes purchasing choices and behaviours. Youths often exhibit distinct preferences, leaning towards clothing and beauty products, while older individuals may prioritize purchases related to housing, property, and family vehicles. Income level is another crucial factor, with higher disposable income offering more opportunities for luxury spending. At the same time, those in low or middle-income brackets allocate a more significant portion to necessities. Occupation significantly influences buying patterns, as individuals choose items aligned with their professions. Lifestyle, reflecting how an individual desires to live, dictates interactions with the world and embodies guiding beliefs (Kotler & ARM strong, 2012).

2.4. Factors Influencing Consumer Preferences Toward Agriculture Products

Agricultural products encompass food crops, horticulture, plantation, and livestock. The food crops, horticulture, and plantations utilized and marketed are sourced from farms or business units registered by relevant agriculture departments. These registered entities assure food quality and safety through issued registration certificates. Consumer preference is characterized as an individual's inclination, or lack thereof, to purchase and utilize a product or service, reflecting their liking for different product options. It can be viewed as a person's tendency to choose pleasant items. Various factors influence consumer preferences for agricultural products, including:

2.4.1. Product quality

As per Kotler and Keller (2014), quality entails all the features and characteristics of a product or service that can fulfil consumer needs. Quality is a dynamic state, with what is currently deemed high quality potentially being considered lower quality in the future (Tjiptono & Diana, 2003). High-quality agricultural products are crucial in enhancing customers' purchasing decisions for products or services. Mohd Rizaimy *et al.* (2011) explored the correlation between the level of product results, based on the eight dimensions of the quality framework, and its influence on consumer preferences.

2.4.2. Price

Price plays a crucial role as it influences the product image and positioning strategy and is a significant factor in shaping consumer preferences and decisions, as consumers often seek agricultural products with lower prices and discounts (Tjiptono, 2008). Consumers associate price with product quality, with higher prices indicating higher quality. The availability of price information on various ornamental plants online allows consumers to make informed purchasing decisions. Research by Brynjolfsson and Smith (2000) suggests that consumers are inclined to make online purchases due to the generally lower prices of products compared to traditional retail stores or offline environments.

2.4.3. Convenience

Convenience in online purchases is characterized by benefits such as time and effort savings for customers (Eastlick & Feinberg, 1999); Rohm & Swaminathan, 2004). his convenience is evident in reduced time and energy expenditures, including savings on transportation costs and avoidance of crowds and queues (Su & Huang, 2010). Furthermore, Katawetawaraks and Wang (2011) highlight that customers can appreciate the convenience of online purchases, as they have the flexibility to make inquiries even after regular business hours. Jiang *et al.* (2013) have categorized convenience into five (5) dimensions, which are access convenience, search convenience, evaluation convenience, transaction convenience, and possession convenience. Access convenience, facilitated by the Internet, allows customers to shop at any time and from any location, avoiding crowds and minimizing waiting time (Mehrdad *et al.*, 2011). Search convenience involves easily searching for product information and comparing costs online (Monuwe *et al.*, 2004). Evaluation convenience is supported by customer review systems on online platforms, enabling customers to review feedback before making purchase decisions (Jiang *et al.*, 2013). Transaction convenience emphasizes a simple and understandable payment process, as complex payment procedures can reduce online shoppers' satisfaction (Guo *et al.*, 2012). Possession convenience, related to post-purchase evaluations, considers the time and effort required for customers to obtain their desired products and experience their benefits (Jiang *et al.*, 2013).

2.4.4. Time-saving

Time savings constitute one of the most influential factors in online shopping, with browsing or searching through an online catalogue being cited as efficient and time-saving. According to Rohm and Swaminathan (2004), online shopping can save time during the purchase process by eliminating the need to travel to a traditional store. However, some respondents argue that time is also consumed during the delivery of goods or services in online shopping, challenging the perception of time savings (Corbett, 2001). Interestingly, despite potential delays in receiving goods, studies like that by Morganosky and Cude (2000) conclude that time-saving is a primary motivator, particularly among consumers experienced in online grocery buying. The importance of the time-saving factor cannot be overlooked as a motivator for online purchasing. Moreover, Goldsmith and Bridges (2000) highlight a distinction between online and non-online shoppers, where the former prioritizes convenience, time-saving, and selection, while the latter expresses concerns about security, privacy, and on-time delivery.

2.4.5. Delivery service

Efficient delivery service plays a significant role in e-commerce, as highlighted by Martín and Camarero (2009). Ho *et al.* (2010) further emphasize the importance of delivery as a crucial criterion in the decision-making process for selecting a suitable merchant, with approximately 82% of reviewed papers focusing on the delivery aspects influencing consumers' choice of a merchant. Batte and Ernst (2007) provide evidence of the importance of delivery, particularly in the agricultural context. Their research indicates that, beyond price considerations, enhanced delivery service impacts a farmer's decision to purchase outside their community. The significance of delivery service becomes even more apparent in the agricultural sector, particularly concerning crop protection products like ornamental plants. Timely delivery is crucial for cost-effective crop protection, where economic thresholds determine critical infestation levels requiring prompt intervention to avoid economic losses (Ramsden *et al.*, 2017). Delivery delays could jeopardize merchants' success in e-commerce (Briggeman & Whitacre, 2008).

Floriculture companies and entrepreneurs employ various marketing methods, including online sales, to enhance profits and business growth. Therefore, those utilizing internet platforms to market ornamental plant products should comprehend the factors influencing consumer preferences in online purchasing. Insights from previous studies emphasize priority factors such as product quality, pricing, time savings, and delivery service in online store purchases. Additionally, these factors are subject to changes in consumer behaviour influenced by psychological, social, cultural, personal, and economic factors.

3. Material and Method

The study was conducted through an online survey in Malaysia since the floriculture industry shows a high demand for online platforms. Two hundred respondents participated

in this online questionnaire, but only 154 completed it. Roscoe (1975) suggested that sample sizes larger than 50 and less than 500 are appropriate for most studies. Descriptive analysis is a statistic used to describe the data collected in a study. The data is summarized and described in simple graphics.

4. Result and Discussion

4.1. Respondents' Ornamental Plants Purchasing Profiles

This analysis aims to understand better the ornamental plants purchased by the respondents. This analysis discussed the primary ornamental plants planted, cost of purchasing, and the type of ornamental plants purchased by respondents online based on the result and discussion below. Table 1 shows the primary ornamental plants that respondents plant in this survey. Caladium is the most ornamental plant respondents planted, comprising 63.6% or 98 respondents. Caladium is mostly planted due to high demand and is popular among consumers. It is followed by orchids, 48.7% or 75 respondents, and Bougainvillea, 46.1% or 71 respondents. While the low frequency is 6.5% of 10 respondents, which is gardenia, this may be because gardenia prefer well-drained soil with an improper pH may be the reason for no blooms on gardenia. Most respondents planted more than 1 plants because each ornamental plant has its uniqueness and beauty that attracts consumers to plant it.

Table 1. Percentage of Respondents' Main Ornamental Plants in Garden

Main Ornamental Plants	Frequency (n)	Percentage (%)	Rank
Caladium	98	63.6	1
Orchid	75	48.7	2
Bougainvillea	71	46.1	3
Rose	66	42.9	4
Cactus	54	35.1	5
Solenostemon	42	27.3	6
Daisy	40	26.0	7
Potulaca	37	24.0	8
Colocasia	36	23.4	9
Sunflower	33	21.4	10
Petunia Morning Glory	32	20.8	11
Marigold	28	18.2	12
Lily	24	15.6	13
Fern	23	14.9	14
Cycas	20	13.0	15
Hoya	14	9.1	16
Aglaonema	13	8.4	17
Hydrangea	13	8.4	17
Canna	12	7.8	18
Gardenia	10	6.5	19

Table 2 shows the cost of purchasing ornamental plants for a month among the respondents in this study. On average, most respondents spend their money to purchase ornamental plants per month between RM 31 and RM 50, 26.0% of 40 respondents. It is followed by a monthly purchase between RM 10 and RM 30, 23.4% or 36 respondents, and a monthly purchase between RM 51 and RM 90, 23.4% or 36 respondents. Some respondents

spend to purchase ornamental plants per month between RM 100 to RM 150 which is 19.5% or 30 respondents, purchases per month between RM 151 to RM 200 which is 2.6% or eight respondents; purchases per month between RM 201 to RM 350 which is 2.6% or four respondents and purchases per month between RM 351 to RM 400, 1.3% or two respondents. The cost of this purchase is influenced by the rate of income per month among the respondents of this study.

Table 2. Percentage of Cost Purchasing Ornamental Plants

Cost of Purchasing (Monthly)	Frequency (n)	Percentage (%)
RM 10–30	36	23.4
RM 31–50	40	26.0
RM 51–90	34	22.1
RM 100–150	30	19.5
RM 151–200	8	5.2
RM 201–350	4	2.6
RM 351–400	2	1.3
Total	154	100.0

Table 3 shows the types of ornamental plants purchased among respondents in this survey: seed, seedling, adult plants, cutting, and tuber. From the result, 82.5% of 127 respondents buy ornamental plants with seedling type. Similarly with other types of purchased ornamental plants, which is adult plants which are 46.8% or 72 respondents who bought that type, followed by seeds type which is 36.4% or 56 respondents, cutting type which is 35.7% or 55 respondents and tuber type 13.6% or 21 respondents. The respondents in this survey also bought ornamental plants in more than 1 type.

Table 3. Purchased Ornamental Plants

Type of Ornamental Plants	Frequency (n)	Percentage (%)
Seed	56	36.4
Seedling	127	82.5
Adult Plant	72	46.8
Cutting	55	35.7
Tuber	21	13.6
Total	154	100.0

Table 4 shows the estimated price for 1 type of ornamental plant that respondents purchase online. On average, most respondents buy 1 type of ornamental plant online for less than RM 20, 77.3% or 119 respondents, followed by a price between RM 21 to RM 90, 16.2% or 25 respondents. Only a few respondents bought 1 type of ornamental plant with a price between RM 91 and RM 200, which is 5.8% or nine respondents, and a price between RM 301 and RM 400, which is 0.6% or one respondent.

Table 4. Price Range of Purchased Ornamental Plants Through Online

Price	Frequency (n)	Percentage (%)
Below RM 20	119	77.3
RM 21–RM 90	25	16.2
RM 91–RM 200	9	5.8
RM 201–RM 300	0	0

Price	Frequency (n)	Percentage (%)
RM 301–RM 400	1	.6
RM 401 Above	0	0
Total	154	100.0

Table 5 shows the platform media the respondents chose to purchase ornamental plants online. The leading media platform s used to buy ornamental plants online are Facebook, which has 67.5% of 104 respondents, and Shopee, which has 66.2% or 102 respondents who use it. Other media platforms are used, namely WhatsApp, which is 39.6% or 61 respondents. Lazada is 19.5% or 30 respondents, and Mudah.com is 14.9% or 23 respondents. Meanwhile, media platform s for Carousell and individual websites show the exact percentage of 3.9% or six respondents. Most respondents buy ornamental plants online through more than one media platform listed.

Table 5. Media Platform Used to Purchased Ornamental Plants Online

Media Platform	Frequency (n)	Percentage (%)
Facebook	104	67.5
WhatsApp	61	39.6
Mudah.com	23	14.9
Shopee	102	66.2
Lazada	30	19.5
Carousell	6	3.9
Individual Website	6	3.9
Total	154	100.0

4.2. Factors Influencing the Preference toward Ornamental Plants Purchasing Through Online

The questions of factors influencing consumer preference toward ornamental plants purchasing online were asked in the form of a Likert scale. The Likert scale is used to test the preference level of respondents toward purchasing ornamental plants online. All of the statements are examined by using five points of Likert scale anchored with “strongly disagree” (1), “disagree” (2), “not sure” (3), “agree” (4) and “strongly agree” (5). Frequency, mean, standard deviation, the total average mean of preferences and mean level of respondents' preferences for each factor toward purchasing ornamental plants online are calculated to measure. Five (5) factors, price, quality, time saving, convenience and delivery service, influence the respondents' preference level towards purchasing ornamental plants online. Each factor has six (6) statements that were asked on a Likert scale and ranked based on the mean calculated.

4.2.1. Respondent's price preferences toward purchasing ornamental plants through online

Table 6 shows the result where the highest mean is 4.175 with the statement “I consider the price of the ornamental plant before making a purchasing decision through the online store”, while the lowest mean is 3.669 with the statement “I think the higher the price of the product, the better the quality perceived if purchase ornamental plant through the online store”. In conclusion, most respondents are very concerned about the price before

purchasing ornamental plants online and assume that not all plants are quality if the seller charges a high price. Table 7 shows that 90.4% of respondents are at a high level of preference for price factor. Concluding from the results, respondents will decide to purchase ornamental plants online by considering the price first.

Table 6: Price Preferences Towards Purchasing Ornamental Plants Through Online

Variables	Frequency (n) and Percentage (%)					Mean	S.D.
	1	2	3	4	5		
I purchase ornamental plants online based on the price	6 (3.9)	11 (7.1)	8 (5.2)	80 (51.9)	49 (31.8)	4.006	1.006
Price will be my first choice in purchasing ornamental plants through the online store	3 (1.9)	5 (3.2)	28 (18.2)	69 (44.8)	49 (31.8)	4.013	0.900
I consider the price of ornamental plants before making a purchasing decision through the online store	0 (0.0)	4 (2.6)	17 (11.0)	81 (52.6)	52 (33.8)	4.175	0.724
I think the higher the product price, the better the quality perceived if purchasing ornamental plants through the online store.	15 (9.7)	9 (5.8)	22 (14.3)	74 (48.1)	34 (22.1)	3.669	1.172
Price promotion (discount) will influence my purchasing intention through the online store	3 (1.9)	11 (7.1)	19 (12.3)	67 (43.5)	54 (35.1)	4.026	0.969
I will refuse to purchase the ornamental plant through an online store if the price is too high through the online store.	0 (0)	10 (6.5)	15 (9.7)	68 (44.2)	61 (39.6)	4.169	0.854
Total Average Mean						4.009	0.665

Note: 1: strongly disagree, 2: not agree, 3: not sure, 4: agree, 5: strongly agree

Table 7. Price Preferences Level towards Purchasing Ornamental Plant Through Online

Level	Frequency	Percentage (%)	Mean	S.D.
Low (1-2.33)	3	1.9		
Moderate (2.34-3.66)	27	17.4	4.009	0.665
High (3.67-5.0)	124	80.4		
Total	154	100		

4.2.2. Respondent’s quality preferences toward purchasing ornamental plants online

Table 8 shows results where the highest mean is 4.455 with the statement “I will evaluate the quality of purchase ornamental plants online by reading at the feedback reviews”, while the lowest mean is 3.780 with the statement “I purchase high-quality ornamental plants plant through online because it has good colour and shape”. In conclusion, most respondents will evaluate the quality of ornamental plants by looking at the feedback of consumers who have bought the plant online. Table 9 shows that 89.1% of respondents have a high level of preference towards quality. Concluding from the results, the respondents will decide to purchase of ornamental plants online by assessing the quality of the plants in advance with various aspects.

Table 8. Quality Preferences Towards Purchasing Ornamental Plants Through Online

Variables Quality	Frequency (n) and Percentage (%)					Mean	S.D.
	1	2	3	4	5		
I feel more self-assured if the information about the ornamental plant is specified appropriately online	0 (0.0)	8 (5.2)	16 (10.4)	72 (46.8)	58 (37.7)	4.169	0.815
Quality has become my first consideration in purchasing ornamental plants online	0 (0.0)	0 (0.0)	16 (10.4)	62 (40.3)	76 (49.4)	4.390	0.670
I purchase high-quality ornamental plants online because it has good color and shape	3 (1.9)	17 (11.0)	32 (20.8)	61 (39.6)	41 (26.6)	3.780	1.024
I will evaluate the quality of purchasing ornamental plants online by reading the feedback reviews	0 (0.0)	0 (0.0)	7 (4.5)	70 (45.5)	77 (50.0)	4.455	0.584
I will not buy ornamental plants online if the seller does not show a picture of the product and feedback reviews	0 (0.0)	0 (0.0)	16 (10.4)	56 (36.4)	82 (53.2)	4.427	0.675
I believe looking at reviews of purchasing ornamental plants online shows the product has good quality	0 (0.0)	0 (0.0)	12 (7.8)	81 (52.6)	61 (39.6)	4.318	0.613
Total Average Mean						4.257	0.542

Note: 1: strongly disagree, 2: not agree, 3: not sure, 4: agree, 5: strongly agree

Table 9. Quality Preferences Level Towards Purchasing Ornamental Plants Through Online

Level	Frequency (n)	Percentage (%)	Mean	S.D.
Low (1–2.33)	0	0.0		
Moderate (2.34–3.66)	17	10.9	4.257	0.542
High (3.67–5.0)	137	89.1		
Total	154	100		

4.2.3. Respondent’s time-saving preferences toward purchasing ornamental plants through online

Table 10 shows the results where the highest mean is 4.344 with the statement “I will purchase the ornamental plant online if I can buy it without having to wait long”, while the lowest mean is 4.097 with the statement “I will purchase the ornamental plant through online, if I for an hour, I can choose ornamental plant products from various online stores and websites”. As the conclusions from the results of the study, the respondents purchase ornamental plants online because they do not have to wait too long to buy the product rather than at the physical store. Table 11 shows that 90.3% of respondents have a high level of preference towards time-saving. Conclusions from the study results, respondents tend to buy ornamental plants online since many conveniences influence respondents to purchase the product.

Table 10. Time Saving Preferences towards Purchasing Ornamental Plants Through Online

Variables	Frequency (n) and Percentage (%)					Mean	S.D.
	1	2	3	4	5		
Time Saving							
I will purchase the ornamental plants through online, if I can save my time and fare cost	0 (0.0)	4 (2.6)	6 (3.9)	81 (52.6)	63 (40.9)	4.318	0.674
I will purchase the ornamental plants through online, if I can buy it at any time	0 (0.0)	4 (2.6)	17 (11.0)	71 (46.1)	62 (40.3)	4.240	0.750
I will purchase the ornamental plant through online, if I have more time to make the choice of buying	0 (0.0)	9 (5.8)	6 (3.9)	82 (53.2)	57 (37.0)	4.214	0.775
I will purchase the ornamental plant through online, if I for an hour, I can choose ornamental plant products from various online stores and website	5 (3.2)	4 (2.6)	15 (9.7)	77 (50.0)	53 (34.4)	4.097	0.913
I will purchase the ornamental plant through online, if I can purchase ornamental plants immediately through online store without having to visit the store	0 (0.0)	4 (2.6)	11 (7.1)	73 (47.4)	66 (42.9)	4.305	0.717
I will purchase the ornamental plant through online, if I can buy it without having to wait long	0 (0.0)	4 (2.6)	6 (3.9)	77 (50.0)	67 (43.5)	4.344	0.680
Total Average Mean						4.253	0.649

Note: 1: strongly disagree, 2: not agree, 3: not sure, 4: agree, 5: strongly agree

Table 11. Time Saving Preferences Level towards Purchasing Ornamental Plants Through Online

Level	Frequency (n)	Percentage (%)	Mean	S.D.
Low (1–2.33)	4	2.6		
Moderate (2.34–3.66)	11	7.1	4.253	0.649
High (3.67–5.0)	139	90.3		
Total	154	100		

4.2.4. Respondent’s convenience preferences toward purchasing ornamental plants online

Table 12 shows the results where the highest mean is 4.312 with the statement “I will purchase the ornamental plant online if I can compare the price of the product”, while the lowest mean is 4.090 with the statement “I will purchase the ornamental plant through online if I have more choices”. Table 13 shows that 88.4% of respondents have a high level of preference towards time-saving. Conclusions from the study results, respondents tend to buy ornamental plants online since many convenience factors influence respondents to purchase the product.

Table 12. Convenience Preferences Towards Purchasing Ornamental Plants Through Online

Variables	Frequency (n) and Percentage (%)					Mean	S.D.
	1	2	3	4	5		
I will purchase the ornamental plant through online, if I can get various information about the products	0 (0.0)	11 (7.1)	7 (4.5)	69 (44.8)	67 (43.5)	4.247	0.843
I will purchase the ornamental plant through online, if I can find ornamental plant products quickly	0 (0.0)	8 (5.2)	25 (16.2)	75 (48.7)	46 (29.9)	4.117	0.824
I will purchase the ornamental plant through online, if I have more choices	0 (0.0)	8 (5.2)	12 (7.8)	92 (59.7)	42 (27.3)	4.090	0.744
I will purchase the ornamental plant through online, if I can compare price of the product	0 (0.0)	8 (5.2)	9 (5.8)	64 (41.6)	73 (47.4)	4.312	0.805
I will purchase the ornamental plant through online, if I can make payment through online than payment in cash	0 (0.0)	8 (5.2)	25 (16.2)	75 (48.7)	47 (29.9)	4.033	0.820
I will purchase the ornamental plant through online, if I can get a response quickly when I asking the seller about the product purchasing	0 (0.0)	11 (7.1)	10 (6.5)	71 (46.1)	62 (40.3)	4.195	0.850
Total Average Mean						4.166	0.736

Note: 1: strongly disagree, 2: not agree, 3: not sure, 4: agree, 5: strongly agree

Table 13. Convenience Preferences Towards Purchasing Ornamental Plants Through Online

Level	Frequency (n)	Percentage (%)	Mean	S.D.
Low (1–2.33)	8	5.2		
Moderate (2.34–3.66)	10	6.4	4.166	0.736
High (3.67–5.0)	136	88.4		
Total	154	100		

2.4.5. Respondent’s delivery service preferences toward purchasing ornamental plants through online

Table 14 shows the results where the highest mean is 4.533 with the statement “I will purchase the ornamental plants online if I know about the quality and methods of packaging that the seller will use”, while the lowest mean is 3.980 with the statement “I will purchase the ornamental plants through online if the shipping cost is suitable”. Table 15 shows that 100% of respondents have a high level of preference towards delivery service. Conclusions from the results: respondents will purchase ornamental plants online if the seller provides a good delivery service to consumers.

Table 14. Delivery Service Preferences towards Purchasing Ornamental Plants Through Online

Variables	Frequency (n) and Percentage (%)					Mean	S.D.
	1	2	3	4	5		
Time-Saving							
I will purchase the ornamental plants through online if the seller provides free shipping voucher	0 (0.0)	0 (0.0)	0 (0.0)	101 (65.6)	53 (34.4)	4.345	0.477
I will purchase the ornamental plants through online if the shipping cost is suitable	0 (0.0)	0 (0.0)	25 (16.2)	107 (69.5)	22 (14.3)	3.980	0.554
I will purchase the ornamental plants through online if I know about which delivery service company will be use by seller	0 (0.0)	0 (0.0)	12 (7.8)	107 (69.5)	35 (22.7)	4.150	0.534
I will purchase the ornamental plants through online if I know about the quality and methods of packaging that the seller will use	0 (0.0)	0 (0.0)	0 (0.0)	72 (46.8)	82 (53.2)	4.533	0.501
I will purchase the ornamental plants through online if the fast-shipping service will use by seller	0 (0.0)	0 (0.0)	16 (10.4)	99 (64.3)	39 (25.3)	4.150	0.581
I will purchase ornamental plant through the online if the delivery information is clearly stated such as the delivery date, time etc.	0 (0.0)	0 (0.0)	10 (6.5)	117 (76.0)	27 (17.5)	4.110	0.480
Total Average Mean						4.211	0.323

Note: 1: strongly disagree, 2: not agree, 3: not sure, 4: agree, 5: strongly agree

Table 15. Delivery Service Preferences Level towards Purchasing Ornamental Plant Through Online

Level	Frequency (n)	Percentage (%)	Mean	S.D.
Low (1–2.33)	0	0.0		
Moderate (2.34–3.66)	0	0.0		
High (3.67–5.0)	154	100	4.211	0.323
Total	154	100		

4.3. Problems with Purchasing Ornamental Plants Online

The problems faced by the consumer in purchasing ornamental plants online are also considered vital information for the present study in order to help the consumer to know the problem about purchasing online. There are numerous problems associated with purchasing ornamental plants online. However, for this study, there are only thirteen (13) problems considered as the standard and significant problems among respondents in the study. From these nine (9) problems, the respondents are free to choose more than one problem in online purchasing. Table 16 shows the result from the online survey questionnaire. Obviously, late delivery service has become the main problem in the study, where they are 117 respondents or 76.0%, face this problem while buying ornamental plants online. The second problem faced by 108 respondents or 70.1% is unexpected product quality and bad packaging, which is the third problem that 107 respondents, or 69.5%, in the study. The minor problem in this study is product purchase cancellation, with are only 21 respondents or 13.6%.

Table 16. Problems Associated with Online Purchases for Ornamental Plants

Problems	Frequency (n)	Percentage (%)
Payment System	70	45.5
Low Quality of Product	86	55.8
Late Delivery Time	117	76.0
Expensive Transportation Charges	85	55.2
Unfriendly Seller Service	50	32.5
Long Delivery Period	88	57.1
Unexpected Product Quality	108	70.1
Less Quantity	30	19.5
Unexpected Size	66	42.9
Scammer	75	48.7
Product Purchase Cancellation	21	13.6
Bad Packaging	107	69.5
Worst Handling by Delivery Service	86	55.8

5. Conclusions and Recommendations

From the descriptive analysis, the majority of the respondents purchase ornamental plants online occasionally at Facebook, shoppe, and WhatsApp which are the most of the plant types they buy are seedling and adult plants with the cost of each plant being less than RM 20. The majority of respondents state that price, quality, time saving, convenience and delivery service are the preference levels in purchasing online. Delivery service which higher-level preference with 100%, among others, because an almost respondents stated that they would purchase the ornamental plants online if they know about the quality and methods of packaging that the seller will use, which is a high mean score statement is 4.533. The low level of preference is price, with 1.9% which, the statement they consider the price of ornamental plants before making a purchasing decision online with the mean score of 4.175.

According to the study results, five (5) factors would influence consumers' preferences toward purchasing ornamental plants: price, quality, time-saving, convenience and delivery service. Thus, the seller should take steps in which the online store must demonstrate that online purchasing is not only from these factors; the seller must also offer other incentives and motivations to attract consumers. So, to build consumer preferences toward purchasing ornamental plants online, the seller should offer more rewarding purchasing online presently available that would benefit in increasing the number of consumers to purchase online and continue doing so in future. Further, sellers need to provide a competitive price advantage for ornamental products to attract consumers to the website and encourage them to make a purchase decision. In order to avoid intense price competition, the seller should need to find other ways to differentiate themselves from their competitors. Therefore, the research findings suggest that web stores need to provide more convenience and product ranges to attract more online consumers.

Author Contribution: Conceptualization, Man, N.; Methodology, Man, N.; Data analysis, Mohd Tanos, M. M.; Writing original draft preparation, Man, N.; Writing review and editing, Kemat, N.

Acknowledgement: The authors would like to thank the Department of Agribusiness and Bioresource Economics, Faculty of Agriculture for the assistance while completing this research.

Funding: There is no funding for this research.

Conflict of Interest: The authors declare no conflict of interest in this work.

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