

# Assessing the Influence of Flow on Online Shopping Intentions: Direct Effects and Attitudinal Mediation

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## Abstract:

*This study explores the rapidly growing trend of online retail, focusing on how Flow directly influences online shopping intentions, with attitude towards online shopping as a mediating factor. Flow is the psychological state where individuals become totally immersed in an activity, an important element in enhancing the online shopping experience. The COVID-19 pandemic has caused an unprecedented shift in lifestyle, significantly altering consumer attitudes. As we become more comfortable navigating the internet, e-commerce stores face harder challenges to drive purchase intent. Data for this cross-sectional study was collected from 583 respondents through a combination of self-administered online surveys and physical questionnaires, using convenience sampling. Partial Least Squares Structural Equation Modelling (PLS-SEM) was employed to test the research model. Results indicate that both Flow and attitude significantly impact purchase intention, with attitude playing a key mediating role. This study hoped to provide insights to help marketers and online retailers to better understand the evolving influencing factors of consumer online purchase intent behaviour and to develop informed strategies to convert consumers browsing into purchasing.*

## ARTICLE INFORMATION

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## INTRODUCTION

Malaysia's digital economy is a cornerstone of its economic strategy under the Twelfth Malaysia Plan (2021–2025). This plan emphasises accelerating digital adoption, enhancing e-commerce growth, and fostering innovation. The research's focus on behavioural triggers influencing online shopping is directly relevant to these objectives, as it identifies factors that can boost e-commerce participation. The study's findings can help online businesses in Malaysia optimise their strategies, aligning with government initiatives like the National eCommerce Strategic Roadmap. Furthermore, the research has implications for small and medium enterprises (SMEs), which are integral to Malaysia's economy. SMEs can utilise these insights to enhance customer acquisition and retention, thereby contributing to economic resilience and growth. E-commerce's role as a significant contributor to Malaysia's GDP further underscores the importance of understanding consumer behaviour to sustain this sector's expansion.

The COVID-19 pandemic forced both consumers to adapt to new ways of shopping and businesses to adopt new ways of operating to survive (Jaumotte *et al.*, 2023; Vowels *et al.*, 2022; Yan, 2020; Soto-Acosta, 2020). E-commerce sales are expected to reach \$4.1 trillion by 2024, with an annual growth rate (CAGR) of 9.5% from 2024 to 2029, resulting in a market size of \$6.5 trillion by 2029 (Statista, 2024). The COVID-19 pandemic significantly sped up the digital transformation across many industries, with retail being one of the most impacted sectors. Businesses were compelled

to adapt to new ways of operating, both during and after lockdowns, to survive (Jaumotte *et al.*, 2023; Soto-Acosta, 2020).

The rapid rise of online shopping reflects the shift in power from retailers to consumers. E-retailers must continuously innovate, simplify their offerings, and make them visually appealing while keeping prices competitive (Euromonitor, 2019). As the famous Dean Kamen, the inventor of the Segway, once said, “Technology is easy to develop. Developing a new attitude, moving the culture, is the difficult part” (Kamen, 2010). With the simplicity and speed of online shopping and understanding of attitudes and behaviours that trigger an online purchase, e-retailers will be able to benefit from this sales channel, optimising conversion rate. It is projected that by 2026, online sales will make up to almost a quarter of total retail sales worldwide (Statista, 2022). As consumers become more skilled at navigating online platforms, they now expect a more immersive and engaging online shopping experience. This growing demand is tied to the concept of Flow (Csikszentmihalyi, 1975), where users are deeply absorbed and focused during their online activities. A seamless and enjoyable shopping experience can increase consumer satisfaction, making it easier for them to make decisions and ultimately complete a purchase. This sense of immersion is now key to enhancing customer engagement and driving higher conversion rates. Online customers are not simply shoppers but also information technology users. Online shopping behaviour is a highly complex and complicated social phenomenon that involves multiple interdependent factors to form the purchase decision beyond the traditional marketing elements (Constantinides, 2004). As such, the study of online purchase intention is constantly underdeveloped with continuous and rapid technology advances and social environment, especially so with the disruption from the global COVID-19 pandemic that gave rise to both health fears and economic uncertainty causing the change in consumer consumption behaviour and preferences (Eger *et al.*, 2021; Grashuis *et al.*, 2020; Mehta *et al.*, 2020).

Globally, the rate of cart abandonment, when customers add items to their online shopping cart but leave without completing the purchase, has been rising steadily from 68% in 2014 to over 70% in 2024 (Gelder, 2024). This highlights the challenge e-commerce sites face in converting website visitors into paying customers. Cart abandonment reflects lost opportunities for sales. The online conversion rate measures the percentage of website visitors who actually complete a purchase transaction. In the first quarter of 2024, the global average was just over 1.5% (Chevalier, 2024). This figure contrasts sharply with the 20-40% conversion rates typically seen in brick-and-mortar stores (Jehanne, 2023), where customers are more likely to buy because they can physically interact with the products and face fewer distractions. This study aims to investigate the psychological and experiential factors that influence online shopping behavior by exploring how constructs such as Flow and consumer attitudes toward online shopping impact purchase intentions. By identifying the direct and mediated paths through which these factors affect conversion. The research also hopes to offer actionable insights for e-commerce platforms to improve user experience, reduce cart abandonment, and enhance overall purchase rates.

## LITERATURE REVIEW

Historically, Tam *et al.* (2024) found that most researchers on consumers' behaviour depended heavily on theories from the Theory of Reasoned Action family like the theory of reasoned action, theory of planned behaviour (Ajzen, 1991) and the technology acceptance model (Davis, 1989), while useful theory like the concept of Flow was ignored (Cheung *et al.*, 2005). In the quest to acquire more online customers, the Flow concept answers the question of an immersive online shopping experience. Being in the Flow affects attitude towards online shopping and purchase intention in the current environment. This is in support of the study by Morales-Solana *et al.* (2022), who found that Flow experience is strongly associated with exploratory shopping behavior and has a positive impact on purchase intention and loyalty. Chen Tsu, and Lu (2018) studied the impact of Flow on mobile shopping intention and found that Flow was significantly related to attitude and purchase intention. Barta *et al.* (2021) highlighted the growing importance of Flow in e-commerce in the current environment given the fierce competition in the digital space. Online retailers can have an advantage over their rivals if they can provide unique and enjoyable experiences for their customers.

In contrast to Novak et al. (2000), who found that the Flow state significantly drives online behavior, Koufaris' (2002) research found that the Flow variable has an insignificant relationship with purchases that are not planned and the intention to return to the online store. This raised the question in examining Flow in the study of online shopping behaviour. The difference in both studies is that Novak et al. (2000) measured Flow for web users in general, while Koufaris' (2002) findings are based on consumer behavior during a specific store visit. Bridges and Florsheim (2008) also claimed that being in the state of Flow may not increase the incidents of online purchase as the phenomenon of Flow is complex, led by hedonic elements like telepresence, time distortion, arousal, and challenge, which means to escape from the reality of life. In fact, it is more of the utilitarian elements of Flow focusing on processes like skills, control, and speed that drive shopping behaviour.

Through the years, Flow has been researched in different online shopping situations (Hoffman & Novak, 1996; Webster et al., 1993). Hoffman and Novak (1996) studied the element of playfulness in human-computer interactions and believe the concept of play or Flow in a hypermedia environment holds consumers longer in that environment, hence it is crucial to understand the Flow process and characteristics that are relevant to the navigation system of the site. Hsu et al. (2012) investigated the moderating role of consumer characteristics like propensity to trust, self-confidence and willingness to buy on the relationship between Flow and online shopping behaviour. Hyun et al. (2021) studied the impact of Flow on social media usage and online shopping and found that the flow experience involves a sense of control, interest, concentration, spiritual enjoyment, internal skills, and personal challenges. Flow directly influences shopping intention (Dong et al., 2023; Hyun et al., 2021). Abigail et al. (2024) emphasize the importance of Flow experience during online shopping in developing a stronger emotional connection and attachment to the brand or e-commerce site. The Flow experience is even more prevalent in today's environment, where consumers shop online to forget their daily stresses and demand (Adrianto et al., 2023).

Despite heightened interest in the Flow concept, the theory has its gaps and weaknesses. Koufaris (2002) emphasized that Flow is too broad and vague. The point is echoed by Finneran and Chang (2005) and Obada (2013), who reiterated that available literature on Flow has been inconsistent and diverse. The Flow concept construct and dimensions are both ambiguous and confusing, with no clear empirical models to clarify the relationship between the two, making the theory very hard to adapt (Finneran & Zhang, 2005; Obadã, 2013). Lee and Chen (2010) claimed that there have been over ten different ways of conceptualizing Flow. Even so, Finneran and Chang (2005) recommended extending the Flow model for complex digital environments. Flow is appropriate for the optimal experience with respect to consumers' interaction with the online store, but it cannot explain all types of experiences, especially goal-oriented behaviors (Barari et al., 2020).

Nevertheless, the Flow concept is relevant for online shopping behaviour studies as it provides a useful framework for understanding how individuals engage and immerse themselves with the digital platform and what factors contribute to a positive or negative experience. It continues to be widely studied and applied across a variety of fields, including psychology and business. Flow focuses on the subjective experience of engagement and enjoyment, which is a universal human experience that is relevant across cultures and contexts. Its continued relevance is evident; hence, it has been selected as one of the underpinning theories in the present research model.

## Flow

Concept of Flow (Csikszentmihalyi, 1975) is considered as one of the key constructs in the proposed research, as it has been proven that an interesting and immersive experience “glues” the consumer into the online environment, which drives high engagement that could lead to buying. Customers who achieve the state of flow form a deeper emotional bond and attachment to the brand or platform (Abigail et al., 2024). Csikszentmihalyi (1990) suggested that there are eight features in the phenomenon of the Flow state: a clear goal, a challenge that matches the person's skill, control and ease in managing the task, gives efficient and immediate feedback, focus, loss of self-awareness, a lost sense of time and where the activity is done for the sake of the experience itself. A

combination of any of these features creates extreme enjoyment, worth the energy put in. Hoffman and Novak (1996) suggested that positive consequences of Flow in an online environment enabled increased learning and perceived behavioural control, encouraged exploration and overall engagement. Flow attracts online consumers and favourably affects their attitudes and behaviours (Novak et al., 2000).

Csikszentmihalyi (1975) explained the origin of this positive psychology of thought, the Flow. He defines Flow as the complete feeling and sensation when totally engaged and absorbed in their activity. On a higher emotional level, prolonged Flow experience has even been linked to our well-being as it means full engagement with life, the experience of deep absorption, engagement, and enjoyment (Tse et al., 2021). According to the Model of Flow State (Figure 1), when action overwhelms capabilities, stress and anxiety are experienced; on the flip side, when capabilities overwhelm action, boredom and even anxiety are experienced. Being in the Flow means action is balanced with skills, achieving an autotelic experience where consumers feel that their action has an end or purpose.

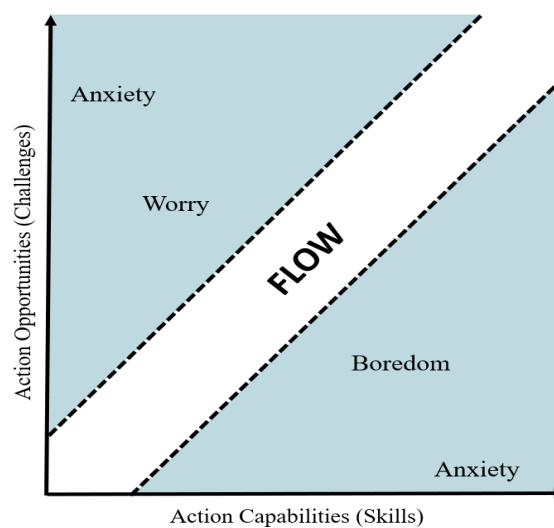


Figure 1: Model of Flow State (Csikszentmihalyi, 1975)

This study suggests that when consumers experience flow in a computer-mediated environment (Yin et al., 2023), browsers or customers feel completely engaged, which in turn influences their intention to make a purchase. Flow motivates customers to review and spend more time on the website (Kabadayi & Gupta, 2005). Bridges and Florsheim (2008) added that Flow elements also provide utilitarian or functional value associated with online buying, like a user's perceived skill to navigate and interactive speed. Hence, investigation in development of the digital platform, User Interface (UI) like website design and User Experience (UX) referring to the navigation system that facilitates customer journey from search for information to purchase completion is encouraged. Ensuring that it is a positive experience every step of the way, leading to increased sales, profitability, and customer loyalty.

Building on the promises of Flow concept, Guo and Poole (2009) studied the complete structure of the Flow model from the perspective of antecedents and website complexity (Guo & Poole, 2009). Ozkara et al. (2017) found that Flow as a single dimension has a significantly positive effect on purchase intention. When Flow is approached at a multidimensional level, inconsistent results appear as it overlooks the significance of both the utilitarian and hedonic aspects of the research context. The most valuable antecedent for Flow is the dimension of “enjoyment”, “perceived control” and “merging of action and awareness” (Ozkara et al., 2017). Mahnke et al. (2015) developed a grounded theory of Flow online shopping experiences for some knowledge and guidance to develop website design for Flow. For the first time, the study utilizes Flow Short Scale to measure Flow and has proven its influence on website usage and continuance intentions (Mahnke et al., 2015).

## Attitude Towards Online Shopping

Attitude is driven by the belief that certain behaviour will result in certain outcomes and the individual's assessment of that outcome. Attitude indicates the extent of an individual's preference towards an object (M. Fishbein & I. Ajzen, 1975). In this present study, an attitude towards a certain behaviour can predict a person's intention to engage in and perform that behaviour (Hansen, 2008). Attitude developed over time and is often difficult to change. It is the positive disposition that an individual has with a certain behaviour (Peña-García et al., 2020). Attitude refers to a person's perception of a favourable or unfavourable behaviour. The more favourable the attitude, the higher the propensity for an individual to be engaged in the behaviour (Hansen, 2008). Wu et al. (2017) confirmed that attitude plays a crucial role in online shopping decision-making. The more positive attitudes towards online shopping, the stronger the purchase intent (Chin & Goh, 2017).

Previous studies in e-commerce (Putro & Haryanto, 2015; Shim et al., 2001) showed that attitude towards online shopping significantly influenced online shopping intention, significantly increased the likelihood to make an online purchase (Kim & Park, 2005). As such, in the proposed research model in this present study, attitude plays an important role as the immediate antecedent in influencing online purchase intention.

## Purchase Intention Predictor of Actual Behaviour

Purchase intention is when consumers are interested in buying a product. They still have to make the decision of when to buy and how much they want to spend making the actual purchase (Putri, 2024). Studies on online purchase intention are usually based on the assumption that intention predicts behavior (Chen & Hung, 2015). Core to this present study is to understand the driving forces behind customers' online purchase intention from the experiential perspective mediated by attitude towards online shopping.

Purchase intention is the pre-purchase stage that motivates customer behaviour to make an actual purchase (Peña-García et al., 2020). Purchase intention is different from actual purchase. Purchase intention simply refers to the possibility of consumers buying a product or service in the future. Recent studies of Flow or immersive online experience more often than not position Flow as the mediating factor rather than the main variable influencing online purchase (Putri, 2024; Dong et al., 2023). Zhang and Wang (2024), who analysed studies of Flow in the past 40 years, found that the studies on Flow were applied to a few themes like technology, gaming, sports, creativity, and education. This provides a macro view that Flow is not frequently applied in studies of online shopping behaviour. Online purchase intention here measures consumers' intent to perform the task of making an online purchase or any form of sale transaction. It is believed that intention is the best predictor of actual behaviour (Peña-García et al., 2020; Chelvarayan et al., 2022; Armitage & Conner, 2001). It is the cognitive representation of the consumers ready to act upon the intended behaviour and the extent to which customers are willing to make a purchase at the online store (Peña-García et al., 2020; Pavlou, 2003; Ajzen, 1991). The stronger an individual's purchase intention, the more likely the behaviour of making a purchase will follow (Hagger et al., 2022). It hypothesised that purchase intention has a direct relationship with Flow and attitude towards online shopping. It is also hypothesised that online purchase intention has an indirect relationship with Flow through attitude towards online shopping. This study proposed the following hypotheses:

H<sub>1</sub>: Attitude positively influences online purchase intention

H<sub>2</sub>: Flow positively influences online purchase intention.

Nurlaili and Wulandari (2024) studied online impulsive buying and found that Flow experience has a significant positive impact on online impulsive buying decisions. A pleasant Flow experience during online shopping can boost impulsive buying as consumers feel more involved and enjoy the shopping process. Flow is predicted to significantly influence purchase intention (Beatty & Ferrell, 1998; Koufaris, 2002). The researcher is also keen to

find out the mediation impact of attitude towards online shopping, if any, on the relationship between the main construct and purchase intention. When an online platform is easy to use, simple, and has a smooth Flow, customers will be more likely to consider online shopping (Manwaluddin et al., 2018) and eventually make a purchase. The literature review reveals that attitudes towards online shopping, combined with experience in the system usage journey, are the main determinants triggering online purchase intentions.

### Flow on Attitude Towards Online Shopping and Purchase Intention

Someone who is in the Flow shifts into a kind of experience when they become completely immersed in performing an activity. Flow is a useful variable to explain web browsing behaviour from the perspective of enhancing compelling online consumer experiences (Hoffman & Novak, 1996; Koufaris, 2002; Siekpe, 2005; Smith & Sivakumar, 2004). Hoffman & Novak (1996) proposed the positive impact of Flow in an online environment as it enabled increased learning and perceived behavioural control, encouraging exploration and overall engagement. Koufaris (2002) explains that when online consumers who enjoy the online shopping experience tend to be more engaged and increase exploratory browsing on the e-commerce site, it leads to buying. Chen et al. (2018) in their study on the impact of Flow on mobile shopping intention found that Flow positively influences customers' attitude and purchase intentions. The more customers gain pleasure from the shopping services, the more positive their attitude towards the shopping experience, the more likely they are to engage in purchase behaviour (Chen et al., 2018).

Flow has been proven to have a positive relationship with purchase intention (Hyun et al., 2021; Lim, 2014; Bridges & Florsheim, 2008; Martins et al., 2019; Richard & Chandra, 2005). Flow was also found to have a direct influence on attitude. Consequently, attitude has been found to fully mediate the relationship between Flow and intention to make an online purchase (Obadă, 2013; Korzaan, 2003) as indicated in hypothesis H3 below.

H<sub>3</sub>: There is a positive relationship between Flow and purchase intention, mediated by attitude towards online shopping.

The research model described in the *literature* and the proposed hypotheses are visualised in a conceptual framework, as shown in Figure 2.

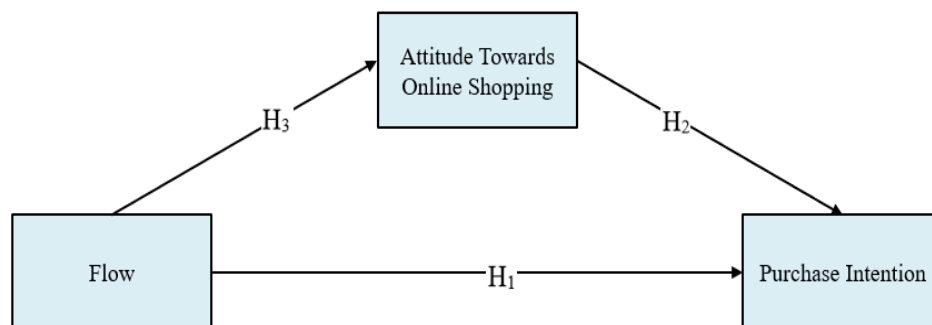


Figure 2: Conceptual Framework (Authors' Own Work)

## RESEARCH METHODOLOGY

This quantitative research seeks to test the relationship between Flow and intention to purchase online directly, and subsequently the attitude toward online shopping as a mediating variable. In the e-commerce arena, which is moving at a fast pace and where persistent engagement has proven vital in influencing consumer decisions, the concept of Flow, a

unique psychological experience characterized by complete absorption in the task, is fundamental. Primary data was collected using a structured questionnaire, and measurement items were adapted from relevant empirical studies (Novak et al., 2000; Huang, 2003; Shih & Fang, 2004; Yoo & Donthu, 2001). The survey was divided into several parts, namely demographic information, online shopping behaviour, and constructs for Flow, attitude, and purchase intention. Data were measured consistently using a seven-point Likert scale from "strongly disagree" to "strongly agree." Data collection was performed cross-sectionally through a combination of self-administered online questionnaires and the physical handout of questionnaires, which enabled the researchers to target a broader sample of online shoppers. The online questionnaire was shared on social media, invited by email and posted in e-commerce-related forums. At the same time, physical copies were given to retail centres and university campuses to add diversity to responses.

To ensure accessibility based on the data collection, the researchers used a convenience sampling method to select the respondents, allowing them to reach a wide range of people who had previous experience with online shopping. We ended up with 583 valid samples, meeting the sample size needed for PLS-SEM analysis. Screening for missing values, response bias and outliers was done with the dataset before analysis to confirm data integrity. Since the study was focused on predictive modeling, the data were analyzed by SMART PLS, which is appropriate to use for complex mediation models and does not have strict assumptions of normality. Convergent and discriminant validity were established by assessing the measurement model itself, which was measured using composite reliability (CR), Cronbach's alpha, and the average variance extracted (AVE). After ensuring reliability and validity, the structural model was assessed for path coefficients, significance levels, and mediation effects. Using a bootstrap sample of 5,000, the analysis tests the indirect effects and considers the mediating role of attitude toward online shopping in the relationship between Flow and purchase intention.

Prior to completing the survey, in accordance with ethical research practices, participants were informed about the purpose of the study and assured of confidentiality, voluntary participation, and anonymity. Ethical approval was granted, and all data were stored securely to prevent unauthorized access. The findings of this study are anticipated to provide valuable perspectives for owners and marketers of online stores in the formulation of strategies aimed at improving customer engagement, optimizing user experience, and maximizing conversions of online purchases. Grasping the way in which Flow and other factors like attitude inform consumer behaviour will help e-retailers enhance their digital marketing tactics to foster greater purchase intent through better user experiences.

### **Data Collection and Analysis**

The data for this study was gathered between July and September 2021, during a period of stricter lockdowns. Shoppers could still choose between going to physical stores or shopping online. The online survey was mainly administered using Google Forms, which helped collect more accurate data since participants could review their answers before submitting. The system also automated data collection, allowing the researcher to track responses in real-time. Since the study focused on online shopping, distributing the survey through digital channels like email, WhatsApp, Facebook Messenger, and WeChat was a suitable approach.

Data collected via physical handouts was also input into Google Forms to consolidate all the data onto a single platform. The data was analysed using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach on SmartPLS4 software. This approach was appropriate as it is regarded as an established technique to measure cause and effect relationships between constructs, whilst eliminating the need for a large sample size (Hair et al., 2014).

## **RESULTS AND DISCUSSION**

Preliminary data analysis involved reviewing, cleaning, coding the raw data, and handling missing data. This was followed by checking assumptions for Structural Equation Modelling (SEM), including testing for normality and detecting outliers. Normality was assessed by looking at skewness and kurtosis values, which, as per Hair et al. (2010),

should be within  $\pm 3$  for skewness and  $\pm 10$  for kurtosis. The data in this study met the criteria for normal distribution (Kline, 2016). To detect outliers, the study used the Mahalanobis  $d^2$  test, following the method by Aguinis et al. (2013), to identify extreme outliers and limit their effect on the results. Based on this test, 18 extreme outliers were removed, leaving 583 samples for further analysis. Although this led to a loss of some data, it was necessary to maintain the reliability of the multivariate analysis (Hair et al., 2019). The remaining data met the SEM criteria and was ready for further analysis.

## Results for the Outer Model

The results from the PLS Algorithm indicated that the composite reliability scores for all variables were greater than the minimum required score of 0.708 (Hair Jr et al., 2017). The Average variance extracted (AVE) scores were reviewed to check for convergent validity. Results from the PLS Algorithm (Table 1) reveal that AVE values for all constructs were greater than 0.5. The Discriminant validity analysis, as demonstrated in Table 2, shows that the HTMT ratios were lower than 0.9. Hence, the requirements for establishing validity were satisfied (Hair Jr et al., 2017). Furthermore, since inner VIF values were lower than 3.3 (Table 3), collinearity was not regarded as an issue (Diamantopoulos & Siguaw, 2006).

Table 1: Composite Reliability and Average Variance Extracted

| Variables                        | Composite Reliability (CR) | Average Variance Extracted (AVE) |
|----------------------------------|----------------------------|----------------------------------|
| Attitude towards online shopping | .897                       | .829                             |
| Flow                             | .910                       | .631                             |
| Purchase Intention               | .906                       | .772                             |

Table 2: The Heterotrait-Monotrait Ratio for Discriminant Validity

| Variables                        | Attitude Towards Online Shopping | Flow | Purchase Intention |
|----------------------------------|----------------------------------|------|--------------------|
| Attitude towards online shopping |                                  |      |                    |
| Flow                             | .313                             |      |                    |
| Purchase Intention               | .392                             | .325 |                    |

Table 3: Later Collinearity Assessment: Inner VIF Values

| Variables                        | Attitude Towards Online Shopping | Flow | Purchase Intention |
|----------------------------------|----------------------------------|------|--------------------|
| Attitude towards online shopping |                                  |      | 1.091              |
| Flow                             | 1.000                            |      | 1.091              |
| Purchase Intention               |                                  |      |                    |

## Results for Direct Effects

A bootstrapping procedure was performed with 5000 subsamples at 5% significance for one-tailed tests to assess the hypothesis for direct effects. For hypotheses concerning direct relationships to be supported, p-values are required to be less than .05, and t-statistics need to be greater than 1.645. Both hypotheses for direct effects were significant. Results in Table 4 demonstrate that Flow (H1:  $\beta = .304$ ,  $SE = .042$ ,  $p = .000$ , t-statistic = 7.265, 95% CI = .236 TO .374) had a direct, positive impact on purchase intention. Attitude towards online shopping (H3:  $\beta = .290$ ,  $SE = .053$ ,  $p = .000$ , t-statistic = 5.516, 95% CI = .201 TO .375) had a direct, positive impact on purchase intention. Thus, H1 and H2 were supported.

Table 4: Results for Hypotheses Testing for Direct Effects

| Variables                                                              | Std. Beta | Std. Error | t-value | p-value | BCCI LL | BCCI UL | Supported (Yes/No) |
|------------------------------------------------------------------------|-----------|------------|---------|---------|---------|---------|--------------------|
| H <sub>1</sub> : Flow → Purchase Intention                             | .304      | .042       | 7.265   | .000    | .236    | .374    | Yes                |
| H <sub>2</sub> : Attitude towards Online Shopping → Purchase Intention | .290      | .053       | 5.516   | .000    | .201    | .375    | Yes                |

### The Mediating Role of Attitude Towards Online Shopping

To test the proposed mediating relationship, bootstrapping was performed. If the bias-corrected confidence intervals are not shown to straddle a zero, the mediating relationship is significant (Zhao *et al.*, 2010). It is also a requirement that the p-value be less than 0.05 and the t-statistic be larger than 1.96 for two-tailed tests (Ramayah *et al.*, 2018). Results from bootstrapping in Table 5 reveal that attitude towards online shopping mediates the relationship between Flow and purchase intention (H<sub>4</sub>:  $\beta = .084$ ,  $SE = .022$ ,  $p = .000$ ,  $t\text{-statistic} = 3.847$ , 95% CI = .045 TO .131). Hence, H<sub>3</sub> is supported.

Table 5: Results for Hypotheses Testing for Mediating Effect

| Variables                                                                     | Std. Beta | Std. Error | t-value | p-value | BCCI LL | BCCI UL | Supported (Yes/No) |
|-------------------------------------------------------------------------------|-----------|------------|---------|---------|---------|---------|--------------------|
| H <sub>3</sub> : Flow → Attitude towards Online Shopping → Purchase Intention | .084      | .022       | 3.847   | .000    | .045    | .131    | Yes                |

This study revealed that Flow and attitude towards online shopping positively influence consumers' purchase intention. Attitude towards online shopping was found to play a significant role in mediating the relationship between Flow and purchase intention.

### THEORETICAL IMPLICATIONS

Findings from this research are consistent with studies done by Hyun *et al.* (2021), Chen *et al.* (2018), Chang *et al.* (2016), and Hsu *et al.* (2012), where Flow is found to be a major determinant in motivating attitude towards online shopping and purchase intention. This includes earlier work by Obada (2013) and Korzaan (2003), who studied the psychological state of Flow in predicting online purchase intention. When consumers are fully absorbed in the process, they are less likely to become overwhelmed by the amount of information they are processing, which can lead to a more positive feeling towards the shopping experience. This explains why attitude towards online shopping was also found to play a significant mediating role, affecting the relationship between the Flow and purchase intention. Whilst the direct relationship between Flow and purchase intention in this study is found to be significant, any change to attitude would still affect the relationship between the two constructs.

Similarly, for the concept of Flow that suggests that an individual's behaviour is determined by their experience of being fully immersed and engaged in an activity, it is found to be applicable even in the context of online shopping during the COVID-19 pandemic. The pandemic may have introduced new factors that may affect the experience of Flow. With concerns about health and safety during the pandemic, the level of immersion and engagement with online shopping may be affected. Similarly, the pandemic may have introduced new distractions and interruptions that may affect the Flow experience, such as interruptions from family members in the same remote workspace or the need to attend to other tasks.

The third theoretical contribution is the inclusion of the Flow concept in the research model, providing a more vigorous examination of online consumer behavior from a psychological experiential perspective. Past research around the area

of online consumer behavior usually relied on theories like the Technology Acceptance Model and Theory of Planned behavior, but rarely included the Flow construct. It is especially crucial in the current time as individuals today have the natural skills to navigate the online environment to work, learn, and play. They could easily immerse themselves in the activity that leads to an unexpected course of action (Ozkara et al., 2017). Flow in past research is generally accepted as a positive experience and a cognitive situation with a positive outcome (Siekpe, 2005; Novak et al., 2003; Koufaris, 2002). Expectedly, the element of Flow experience was found to have a positive direct effect on both the attitude towards online shopping and purchase intention.

## PRACTICAL IMPLICATIONS

The state of Flow is proven to be another significant factor that positively influences online purchase intention. To reduce cart abandonment, it is necessary to build a web or app framework to create a seamless and engaging user experience, from browsing to selecting the options and performing the purchase transaction. There should be minimal distractions, ensuring fast loading, clear and enticing product descriptions, images and usage demonstration. Implementation of a progress tracker could be a good feature as users in a state of Flow will be able to track their progress, indicating how many more steps are left to checkout, reducing both anxiety and the potential of cart abandonment. For this, online businesses can consider pursuing A/B testing with multiple UI/UX to arrive at the optimum user experience by analysing current consumers' historical activities and preferences. Testing with different website designs and different journeys. This can be done by re-evaluating the existing level of interaction on different web pages, navigation path and enhancement of website usability to determine which combination delivers the best results. Moreover, Flow is cultivated by matching the usage challenge to the user's skill level. The online business owner must ensure that the user interface and the steps involved in completing the purchase must match the users' familiarity with online shopping. With fluency and confidence to use the site, it will develop a positive customer shopping experience. The addictive experience can also be found by engaging customers in a two-way conversation by providing speedy responses to customers' questions through virtual customer service and allowing customers to engage with the community of customers to share their experience of the products or services that they have purchased. With the right algorithm and machine learning capabilities, intelligent e-commerce sites also personalised the experience for individual shoppers by only showing them what they have been searching for, according to their tastes and interests. Marketers and online business owners can subscribe to web analytics service providers or platforms to ensure ongoing enhancements of a positive experience, creating Flow when using the site. These tools can help to estimate how much time customers spend on each page, where customers drop off and leave the site, and analysis of competitors' site activities, providing learnings on what worked and what did not work, and how to improve Flow experience to improve future performance.

With the understanding of the factors that can significantly and positively influence online purchase intent, the effort to improve online conversion rate, reducing cart abandonment could start from the time they show any form of interest in the product category, clicking on the company's digital ads, to being a new customer, a returning customer to a loyalist. New engagement opportunities like virtual reality or augmented reality technologies can enhance personalised and interactive virtual shopping experiences (Kim, 2020). Online marketers can consider personalised messages and customised offers based on their previous purchase or based on the likes and interests of the customer segment who had made a similar purchase and treat all customers like VIP members even after only making one purchase. Have more personalised channels like in-app messaging, e-mail, and instant messaging platforms, schedule the engagements with customers to ensure that they constantly engaged with value-added information, innovation, latest news of the product category or even social proof to make customer feels like part of a community leading to the next to purchase cycle where tactical offers can be heightened to encourage a return to the e-store. Bigger online business owners can subscribe to the many customer data management platforms and customer engagement platforms to centralize multiple interactions with individual customers in the digital space, not limited to the e-commerce site but also including social media platforms, email, and in-app marketing, web chat, and customer relationship management capabilities. High-quality one-to-one customer engagements, such as building long-term relationships, drive repeat purchases, increase the basket size of purchase, loyalty, and potentially increase the customer's overall lifetime value with the business.

However, the discussion on Flow user experience cannot end without mentioning the elements of UI (user interface) and UX (user experience) and online conversion rate. User experience (UX) encompasses the overall feeling of enjoyment and satisfaction when interacting with computers. It increases the likelihood for customers to convert (Aji et al., 2022; Gunawan et al., 2021). User experience includes one's perception of the practical aspects, such as usability, ease of use, and flow efficiency of the system (Prayoga et al., 2023). User experience (UX) is supported by the user interface (UI) of a digital platform that refers to the visual and software components of the website or application, designing and making the site more interactive (Gunawan et al., 2021). Pattinaja et al. (2023) and Centeno et al. (2022) went to the extent of claiming that the user interface can determine a user's purchase intention and drive conversion. Strategic use of AI can enhance the customer's shopping experience. If designed well, it helps users stay focused and engaged. But if AI feels intrusive or reduces user control, it can break the immersion. Retailers need to balance automation with personalization to keep shopping smooth, enjoyable, and seamless (Pandey et al., 2025).

## **LIMITATIONS OF THE STUDY**

The first limitation lies in the generalisability of the findings in terms of the sample. The data were collected mainly from Kuala Lumpur and Petaling Jaya territories, Malaysia's most populated and busiest cities. Hence the findings of this study have a limited generalisability to the overall population of online shoppers in these areas only. However, to compensate, this research garnered a relatively large sample size ( $n = 601$ ) to overcome the problem. The second limitation could be the risk of bias that is caused by the disadvantage of the data collection method, specifically, respondents who filled out the survey online. The majority (83%) of the survey questionnaires were completed online. The data was mainly self-reported as opposed to objectively measured. Perception and reality are not the same, there is a possibility that the responses do not reflect the actual thoughts, behaviour, and actions of the respondents. This study collected general responses from respondents without considering their motives to shop, their past online purchasing activities, and experiences, nor specifying any particular e-commerce website. This gives rise to the third limitation of this study. Hedonic and utilitarian motives to shop online affect customers' preference towards purchase intention and certain online retailers (Overby & Lee, 2006).

The fourth limitation of this study is due to its cross-sectional research approach, where data were collected in a specific space of time and using surveys rather than in an experimental setting. It may limit the ability to make causal inferences as the sequence of relationships was collected within a limited timeframe. There is no follow-through if a positive effect on purchase intention is converted into an actual purchase. The final limitation could be the Flow construct in this study. It only examined the overall attitude and feeling of Flow experience. One could argue that Flow is a complex multi-dimensional construct (Sharif & Naghavi, 2021) that includes perceived control, skills or capabilities, enjoyment, concentration, and actions (Hyun et al., 2021). Customer-focused variables like perceived risk, trust, and individual shopping orientation could also play a critical role in influencing online purchase intention beyond attitude and Flow experience, which were not considered in the research framework (Pandey et al., 2025).

## **DIRECTIONS FOR FUTURE RESEARCH**

Several recommendations for future research can be suggested, reflecting the limitations stated in the previous section. To overcome the limited generalisability of the findings, future studies can be taken to other cities and territories. By applying the research model in a different environment than the present location, it would potentially confirm its robustness and provide more evidence of the generalisability of the research results, offering more valuable and practical insights for online marketers and business owners. Future studies may include a lab experiment so that real-time information and respondents' behaviour can be more accurately collected. Detailed descriptions from additional attitudinal, behavioural, and experiential constructs could provide substantive information about a behaviour's determinants, at the level of robustness that can reveal the unique factors that motivate individuals to create intent and to engage in a behaviour. Mixed methods research can be considered, combining both quantitative and qualitative methods. Mixed methods research provides deeper behavioural insights that cannot be found by qualitative or quantitative methods alone, as it combines deductive and inductive thinking (Sekaran & Bougie, 2016). Further research

may also be conducted to investigate the different types of shopping orientations and examine the differences in attitude and intention towards online shopping. Comparing the results of the research model for utilitarian motives versus hedonic motives of online shopping and across different types of industries may offer a different result as well. This would allow marketers to design different marketing campaigns to better suit each consumer despite similarities in demographics.

With market dynamics, technology and digital lifestyle continuously evolving, a longitudinal research design may be better suited and relevant to identify the shift in the role of attitudes and intent, and even psychological needs in impacting actions taken by online consumers in the future. If a longitudinal approach is not feasible due to time and budget constraints, it is recommended to retest the current research model in the future to ascertain the robustness and consistency of the variables in the interactions between attitude, behavior, and psychology to shed more light on their relative importance to explain triggers of purchase intention.

## CONCLUSIONS

Jeff Bezos, CEO of Amazon.com, who is famous for his customer-first slogans, had said, “If you’re competitor-focused, you have to wait until there is a competitor doing something. Being customer-focused allows you to be more pioneering.” (LaGesse, 2008). Being customer focused is the aim of this study; to win online customers. From this research, elements like Flow and attitude towards online shopping are found to be crucial in driving purchase intention. To be in the lead in customer acquisition, online business retailers and marketers must understand customers’ intrinsic motivations and values that would create purchase intent, which eventually leads to the action of making a purchase. To unlock the potential for higher conversions and reduced cart abandonment rate, online retailers should prioritise improving immersive Flow experience and attitude towards online shopping in driving purchase intention. An improved attitude towards online shopping can also enhance the impact of Flow on purchase intention. In the future, customers will come to expect more and more from online retailers. Investing in digital capabilities, such as data management and engagement platforms, predictive analytics, search, social interaction, multimedia content, personalisation, gamification, and more, can overall enhance the immersive experience that physical stores cannot offer (Yohn, 2020). To stay ahead of the game, retailers must continue to adapt and evolve in response to the ever-changing needs of consumers, technology, and market environment.

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## REFERENCES

- Abigail, J., Sari, V. P., & Saputra, D. (2024), “The influence of product quality and online shopping experience (OSE) on consumer loyalty through customer satisfaction on local skincare products”, *Procedia Computer Science*, Vol. 234, pp. 537-544.
- Accenture (2020), “COVID-19: How consumer behavior will be changed. Accenture Now Next.”, available at: <https://www.accenture.com/sk-en/insights/consumer-goods-services/coronavirus-consumer-behavior-research> (assessed 20 June 2024)

- Adrianto, F. A., Yuliana, O. Y., & Jaolis, F. (2023), "Shoppers' loyalty in online marketplace: The impact of interface quality, application incentives, and security/privacy through flow experience", *Journal Manajemen dan Pemasaran Jasa*, Vol. 16 No. 1, pp. 45-62.
- Agag, G. M., Khashan, M. A., & El Gayaar, M. H. (2019), "Understanding online gamers' intentions to play games online and effects on their loyalty: An integration of IDT, TAM and TPB", *Journal of Customer Behaviour*, Vol. 18 No. 2, pp. 101-130.
- Aguinis, H., Gottfredson, R. K., & Joo, H. (2013), "Best-practice recommendations for defining, identifying, and handling outliers", *Organizational Research Methods*, Vol. 16 No. 2, pp. 270-301.
- Aji, C. P., Nadlifatin, R., Persada, S. F., & Siregar, N. J. (2022), "Investigating the Low Conversion Rate Through User Experience Analysis: A Case of Telecommunication Company Website".
- Ajzen, I. (1985), *From intentions to actions: A theory of planned behavior*. In *action control*., Springer, New York, NY.
- Ajzen, I. (1991), "The theory of planned behavior", *Organizational Behaviour and Human Decision Processes*, Vol. 50 No. 2, pp. 179-211.
- Ajzen, I. (2020), "The theory of planned behavior: Frequently asked questions", *Human Behavior and Emerging Technologies*, Vol. 2 No. 4, pp. 314-324.
- Ajzen, I., Fishbein, M., & Heilbroner, R. L. (1980), *Understanding attitudes and predicting social behavior*, Vol. 278. Prentice-hall Englewood Cliffs.
- Armitage, C. J., & Conner, M. (2001), "Efficacy of the theory of planned behaviour: A meta-analytic review", *British Journal of Social Psychology*, Vol. 40 No. 4, pp. 471-499.
- Bagozzi, R. P., & Dholakia, U. M. (2002), "Intentional social action in virtual communities", *Journal of Interactive Marketing*, Vol. 16 No. 2, pp. 2-21.
- Barta, S., Gurrea, R., & Flavián, C. (2021), "The role of flow consciousness in consumer regret", *Internet Research*, Vol. 32 No. 3, pp. 875-896.
- Beatty, S.E. and Ferrell, M.E. (1998), "Impulse buying: Modeling its precursors", *Journal of Retailing*, Vol. 74 No. 2, pp. 169–191.
- Bridges, E. and Florsheim, R. (2008), "Hedonic and utilitarian shopping goals: The online experience", *Journal of Business Research*, Vol. 61 No. 4, pp. 309–314.
- Centeno, T.A., Pacheco, A.C., Sigua, G.D., Tan, N.J. and Fernandez, R. (2022), "Understanding the influence of mobile interface of Shopee and Lazada on customer conversion", *Journal of Business and Management Studies*, Vol. 4 No. 2, pp. 192–202.
- Chang, M., Cheung, W. and Lai, V.S. (2005), "Literature derived reference models for the adoption of online shopping", *Information & Management*, Vol. 42 No. 4, pp. 543–559.
- Chang, S.-H., Chih, W.-H., Liou, D.-K. and Yang, Y.-T. (2016), "The mediation of cognitive attitude for online shopping", *Journal of Information Technology People*, Vol. 29 No. 3, pp. 618–646.
- Chelvarayan, A., Hao, L.F., Fern, Y.S. and Hashim, H. (2022), "Online purchase intention: A study among Gen X in Malaysia", *International Journal of Entrepreneurship, Business and Creative Economy*, Vol. 2 No. 1, pp. 37–47.
- Chen, N.-H. and Hung, Y.-W. (2015), "Online shopping orientation and purchase behavior for high-touch products", *International Journal of Electronic Commerce Studies*, Vol. 6 No. 2, pp. 187–202.
- Chen, Y.M., Hsu, T.H. and Lu, Y.J. (2018), "Impact of flow on mobile shopping intention", *Journal of Retailing and Consumer Services*, Vol. 41, pp. 281–287.
- Chevalier, S. (2024), "Global conversion rates in selected verticals 2024", Statista, available at: <https://www.statista.com/statistics/1106713/global-conversion-rate-by-industry-and-device/> (accessed 10 June 2024).

- Chin, S.-L. and Goh, Y.-N. (2017), "Consumer purchase intention toward online grocery shopping: View from Malaysia", *Global Business and Management Research: An International Journal*, Vol. 9 No. 4 SI, pp. 221–238.
- Conner, M. & Norman, P. (2015), *Predicting and changing health behaviour: Research and practice with social cognition models* (2nd ed.), Open University Press, Maidenhead, Berkshire.
- Constantinides, E. (2004), "Influencing the online consumer's behavior: The web experience", *Internet Research*, Vol. 14 No. 2, pp. 111–126.
- Csikszentmihalyi, M. (1975), "Play and intrinsic rewards", *Journal of Humanistic and Psychology*, Vol. 15 No. 3, pp. 41–63.
- Csikszentmihalyi, M. (1990), *Flow: The psychology of optimal experience*, Harper & Row, New York, NY.
- Davis, F.D., Bagozzi, R.P. and Warshaw, P.R. (1989), "User acceptance of computer technology: A comparison of two theoretical models", *Management Science*, Vol. 35 No. 8, pp. 982–1003.
- Diamantopoulos, A., & Siguaw, J. A. (2006). Formative versus reflective indicators in organizational measure development: A comparison and empirical illustration. *British Journal of Management*, 17(4), 263-282.
- Dong, W.W., Wang, Y.Q. and Qin, J. (2023), "An empirical study on impulse consumption intention of livestreaming e-commerce: The mediating effect of flow experience and the moderating effect of time pressure", *Frontiers in Psychology*, Vol. 13, Article No. 1019024.
- Edge, T. (2022), "COVID-19: Malaysia only in transition to endemic phase, adhere to SOPs, Health DG warns", The Edge Markets, available at: <https://www.theedgemarkets.com/article/covid19-18560-new-cases-march-31> (accessed 31 March 2024).
- Eger, L., Komárková, L., Egerová, D. and Mičík, M. (2021), "The effect of COVID-19 on consumer shopping behaviour: Generational cohort perspective", *Journal of Retailing and Consumer Services*, Vol. 61, Article No. 102542.
- Euromonitor (2019), "Top 10 Global Consumer Trends 2019", Euromonitor Internal Report, available at: <https://www.euromonitor.com/top-10-global-consumer-trends-2019/report> (accessed 1 March 2022).
- Finneran, C.M. and Zhang, P. (2005), "Flow in computer-mediated environments: Promises and challenges", *Communications of the Association for Information Systems*, Vol. 15 No. 4, pp. 82–101.
- Fishbein, M. & Ajzen, I. (1975), *Belief, attitude, intention and behaviour: An introduction to theory and research*, Addison-Wesley, Reading, MA.
- Gelder, K.V. (2024), "Global online shopping cart abandonment rate 2006–2024", available at: <https://www.statista.com/statistics/477804/online-shopping-cart-abandonment-rate-worldwide/> (accessed 1 Feb 2025).
- Grashuis, J., Skevas, T. and Segovia, M.S. (2020), "Grocery shopping preferences during the COVID-19 pandemic", *Sustainability*, Vol. 12 No. 13, Article No. 5369.
- Gunawan, R., Anthony, G. and Anggreainy, M.S. (2021), "The effect of design user interface (UI) e-commerce on user experience (UX)", in IEEE (Ed.), Proceedings of the 2021 6th International Conference on New Media Studies (CONMEDIA), *Jakarta, Indonesia, 24–25 November 2021*, IEEE, Piscataway, NJ, pp. 95–98.
- Guo, Y.M. and Poole, M.S. (2009), "Antecedents of flow in online shopping: A test of alternative models", *Information Systems Journal*, Vol. 19 No. 4, pp. 369–390.
- Hagger, M.S., Cheung, M.W.L., Ajzen, I. and Hamilton, K. (2022), "Perceived behavioral control moderating effects in the theory of planned behavior: A meta-analysis", *Health Psychology*, Vol. 41 No. 2, pp. 155–170.
- Hair, J. F., Black, W. C., Babin, B. J. & Anderson, R. E. (2010), *Multivariate data analysis*, Pearson New International Edition, Harlow, Essex.
- Hair, J. F., Black, W. C., Babin, B. J. & Anderson, R. E. (2019), *Multivariate data analysis*, Pearson New International Edition, Harlow, Essex.

- Hair, J. F., Hult, G. T. M., Ringle, C. & Sarstedt, M. (2014), *A primer on partial least squares structural equation modeling (PLS-SEM)*, Sage Publications, Thousand Oaks, CA.
- Hair, J. F., Hult, G. T. M., Ringle, C. & Sarstedt, M. (2017), *A primer on partial least squares structural equation modeling (PLS-SEM)*, Sage Publications, Thousand Oaks, CA.
- Hansen, T. (2008), "Consumer values, the theory of planned behaviour and online grocery shopping", *International Journal of Consumer Studies*, Vol. 32 No. 2, pp. 128-137.
- Hoffman, D.L. and Novak, T.P. (1996), "Marketing in hypermedia computer-mediated environments: Conceptual foundations", *Journal of Marketing*, Vol. 60 No. 3, pp. 50–68.
- Hsu, C.L., Chang, K.C. and Chen, M.C. (2012), "Flow experience and internet shopping behavior: Investigating the moderating effect of consumer characteristics", *Journal of System Research and Behavioural Science*, Vol. 29 No. 3, pp. 317–332.
- Huang, M.-H. (2003), "Designing website attributes to induce experiential encounters", *Computers in Human Behavior*, Vol. 19 No. 4, pp. 425–442.
- Hyun, H., Thavisay, T. and Lee, S.H. (2021), "Enhancing the role of flow experience in social media usage and its impact on shopping", *Journal of Retailing and Consumer Services*, Vol. 65, Article No. 102492.
- Ifhar, I. (2020), "Sales conversion rate in brick and mortar stores is 7x more than online", available at: [https://www.comqi.com/sales\\_conversion\\_rates\\_more\\_for\\_physical\\_stores/](https://www.comqi.com/sales_conversion_rates_more_for_physical_stores/) (accessed 11 November 2024).
- Jaumotte, F., Oikonomou, M., Pizzinelli, C. and Tavares, M.M. (2023), "How pandemic accelerated digital transformation in advanced economies", available at: <https://www.imf.org/en/Blogs/Articles/2023/03/21/how-pandemic-accelerated-digital-transformation-in-advanced-economies> (accessed 11 Dec 2024).
- Jehanne, M. (2023), "What is conversion rate in retail: Comprehensive guide on its calculation and improvement", available at: <https://contentsquare.com/blog/what-is-conversion-rate-in-retail/> (accessed 11 October 2024).
- Kabadayi, S., & Gupta, R. (2005), "Website loyalty: An empirical investigation of its antecedents", *International Journal of Internet Marketing and Advertising*, Vol. 2 No. 4, pp. 321-345.
- Kamen, D. (2010), "Mr Segway's difficult path", *The Economist*, available at: <https://www.economist.com/technology-quarterly/2010/06/12/mr-segways-difficult-path> (accessed 11 March 2022).
- Kim, J., & Park, J. (2005), "A consumer shopping channel extension model: Attitude shift toward the online store", *Journal of Fashion Marketing and Management: An International Journal*, Vol. 9 No. 1, pp.106-121.
- Kim, R. Y. (2020), "The impact of COVID-19 on consumers: Preparing for digital sales", *IEEE Engineering Management Review*, Vol. 48 No. 3, pp. 212-218.
- Kline, R. B. (2016), *Principles and practice of structural equation modeling*, Guilford Publications, New York, NY.
- Korzaan, M.L. (2003), "Going with the flow: Predicting online purchase intentions", *Journal of Computer Information Systems*, Vol. 43 No. 4, pp. 25–31.
- Koufaris, M. (2002), "Applying the technology acceptance model and flow theory to online consumer behavior", *Information Systems Research*, Vol. 13 No. 2, pp. 205–223.
- LaGessee, D. (2008), "America's best leaders: Jeff Bezos, Amazon.com CEO", available at: <https://www.usnews.com/news/best-leaders/articles/2008/11/19/americas-best-leaders-jeff-bezos-amazoncom-ceo> (accessed 10 March 2022).
- Lee, S.M. and Chen, L. (2010), "The impact of flow on online consumer behavior", *Journal of Computer Information Systems*, Vol. 50 No. 4, pp. 1–10.
- Lim, W.M. (2014), "Understanding the influence of online flow elements on hedonic and utilitarian online shopping experiences: A case of online group buying", *Journal of Information Systems*, Vol. 28 No. 2, pp. 287–306.

- Mahnke, R., Benlian, A. and Hess, T. (2015), "A grounded theory of online shopping flow", *International Journal of Electronic Commerce*, Vol. 19 No. 3, pp. 54–89.
- Manning, M. (2009), "The effects of subjective norms on behaviour in the theory of planned behaviour: A meta-analysis", *British Journal of Social Psychology*, Vol. 48 No. 4, pp. 649–705.
- Manwaluddin, I.I., Teng, L.C., Johari, A.A.H.A., Baharudin, M.F. and Suhaimi, M.H. (2018), "Factors that affect online shopping behaviour on e-business platform towards generation Y in Malaysia", *Journal of Information*, Vol. 3 No. 9, pp. 50–65.
- Martins, J., Costa, C., Oliveira, T., Gonçalves, R. and Branco, F. (2019), "How smartphone advertising influences consumers' purchase intention", *Journal of Business Research*, Vol. 94, pp. 378–387.
- Mehta, S., Saxena, T. and Purohit, N. (2020), "The new consumer behaviour paradigm amid COVID-19: Permanent or transient?", *Journal of Health Management*, Vol. 22 No. 2, pp. 291–301.
- Morales-Solana, D., Esteban-Millat, I. and Alegret Cotas, A. (2022), "Experiences in consumer flow in online supermarkets", *Electronic Commerce Research*, pp. 1–32.
- Novak, T.P., Hoffman, D.L. and Yung, Y.-F. (2000), "Measuring the customer experience in online environments: A structural modeling approach", *Marketing Science*, Vol. 19 No. 1, pp. 22–42.
- Nurlaili, M. and Wulandari, R. (2024), "The impact of promotion, product quality, and trust toward online impulsive buying decisions: The mediating role of flow experience", *International Journal of Management Science and Application*, Vol. 3 No. 2, pp. 54–83.
- Obadă, D.R. (2013), "Flow theory and online marketing outcomes: A critical literature review", *Procedia Economics and Finance*, Vol. 6, pp. 550–561.
- Overby, J.W. and Lee, E.-J. (2006), "The effects of utilitarian and hedonic online shopping value on consumer preference and intentions", *Journal of Business Research*, Vol. 59 No. 10–11, pp. 1160–1166.
- Ozkara, B.Y., Ozmen, M. and Kim, J.W. (2017), "Examining the effect of flow experience on online purchase: A novel approach to the flow theory based on hedonic and utilitarian value", *Journal of Retailing and Consumer Services*, Vol. 37, pp. 119–131.
- Pandey, P.K., Dhaliwal, A. and Pandey, P.K., 2025, "Convergence of online flow and AI-enabled services: the impact on awe experience in e-tail customer journeys", *The International Review of Retail, Distribution and Consumer Research*, Vol. 35 No. 2, pp. 209-236.
- Pattinaja, M.A.G.P., Mangantar, M. and Pandowo, M. (2023), "The impact of user interface and time scarcity on purchase intention through e-commerce Shopee among young adults in Manado", *Jurnal EMBA: Jurnal Riset Ekonomi, Manajemen, Bisnis dan Akuntansi*, Vol. 11 No. 3, pp. 149–160.
- Peña-García, N., Gil-Saura, I., Rodríguez-Orejuela, A. and Siqueira-Junior, J.R. (2020), "Purchase intention and purchase behavior online: A cross-cultural approach", *Heliyon*, Vol. 6 No. 6.
- Prayoga, A.K., Achmad, G.N. and Zulkifli, Z. (2023), "Influence of UI, UX and e-service quality on Tokopedia purchase via perceived risk", *Journal of Social Research*, Vol. 2 No. 5, pp. 1606–1625.
- Putri, A.J. (2024), "Factors influencing consumers' purchase intention mediated by immersive experience: A research agenda", *Journal of International Conference Proceedings*, Vol. 7 No. 1, pp. 55–66.
- Putro, H.B. and Haryanto, B. (2015), "Factors affecting purchase intention of online shopping in Zalora Indonesia", *Journal of Economics, Management and Trade*, Vol. 9 No. 1, pp. 1–12.
- Ramayah, T., Cheah, J., Chuah, F., Ting, H. & Memon, M. (2018), *Partial least squares structural equation modeling (PLS-SEM) using SmartPLS 3.0: An updated guide and practical guide to statistical analysis*, Pearson, London.
- Richard, M.-O., & Chandra, R. (2005), "A model of consumer web navigational behavior: conceptual development and application", *Journal of Business Research*, Vol. 58 No. 8, pp. 1019-1029.

- Sekaran, U. & Bougie, R. (2016), *Research methods for business: A skill building approach*, John Wiley & Sons, Hoboken, NJ.
- Sharif, S.P. and Naghavi, N. (2021), "Online financial trading among young adults: Integrating the theory of planned behavior, technology acceptance model, and theory of flow", *International Journal of Human–Computer Interaction*, Vol. 37 No. 10, pp. 949–962.
- Sharma, A. and Jhamb, D. (2020), "Changing consumer behaviours towards online shopping—An impact of COVID-19", *Academy of Marketing Studies Journal*, Vol. 24 No. 3, pp. 1–10.
- Shih, Y.Y. and Fang, K. (2004), "The use of a decomposed theory of planned behavior to study Internet banking in Taiwan", *Internet Research*, Vol. 14 No. 3, pp. 213–223.
- Shim, S., Eastlick, M.A., Lotz, S.L. and Warrington, P. (2001), "An online prepurchase intentions model: The role of intention to search: Best overall paper award—The Sixth Triennial AMS/ACRA Retailing Conference, 2000", *Journal of Retailing*, Vol. 77 No. 3, pp. 397–416.
- Siekpe, J.S. (2005), "An examination of the multidimensionality of flow construct in a computer-mediated environment", *Journal of Electronic Commerce Research*, Vol. 6 No. 1, pp. 31–43.
- Smith, D.N. and Sivakumar, K. (2004), "Flow and internet shopping behavior: A conceptual model and research propositions", *Journal of Business Research*, Vol. 57 No. 10, pp. 1199–1208.
- Soto-Acosta, P. (2020), "COVID-19 pandemic: Shifting digital transformation to a high-speed gear", *Information Systems Management*, Vol. 34 No. 4, pp. 260–266.
- Statista (2022), "Global retail e-commerce sales 2014–2026", available at: <https://www.statista.com/statistics/379046/worldwide-retail-e-commerce-sales/> (accessed 8 December 2024).
- Statista (2024), "E-commerce – Worldwide", available at: <https://www.statista.com/outlook/emo/ecommerce/worldwide> (accessed 8 December 2024).
- Statista Research Department (2024), "Global revenue of the e-commerce market by country", available at: <https://www.statista.com/forecasts/1283912/global-revenue-of-the-e-commerce-market-country> (accessed 8 December 2024).
- Tam, C., Pereira, F.C. and Oliveira, T. (2024), "What influences the purchase intention of online travel consumers?", *Tourism and Hospitality Research*, Vol. 24 No. 2, pp. 304–320.
- Tse, D.C., Nakamura, J. and Csikszentmihalyi, M. (2021), "Living well by 'flowing' well: The indirect effect of autotelic personality on well-being through flow experience", *The Journal of Positive Psychology*, Vol. 16 No. 3, pp. 1–12.
- Vowels, L.M., Francois-Walcott, R.R., Carnelley, K.B. and Checksfield, E.L. (2022), "Adapting to change: How has COVID-19 affected people's work and personal goals?", *PLoS ONE*, Vol. 17 No. 2, e0262195.
- Wu, W.Y., Quyen, P.T.P. and Rivas, A.A.A. (2017), "How e-servicescapes affect customer online shopping intention: The moderating effects of gender and online purchasing experience", *Information Systems and e-Business Management*, Vol. 15, pp. 689–715.
- Yan, Z. (2020), "Unprecedented pandemic, unprecedented shift, and unprecedented opportunity", *Human Behavior and Emerging Technologies*, Vol. 2 No. 2, pp. 110–112.
- Yin, J., Huang, Y. and Ma, Z. (2023), "Explore the feeling of presence and purchase intention in livestream shopping: A flow-based model", *Journal of Theoretical and Applied Electronic Commerce Research*, Vol. 18 No. 1, pp. 237–256.
- Yohn, D. L. (2020), "The pandemic is rewriting the rules of retail", available at: <https://hbr.org/2020/07/the-pandemic-is-rewriting-the-rules-of-retail> (accessed 11 July 2023).
- Yoo, B. and Donthu, N. (2001), "Developing a scale to measure the perceived quality of an Internet shopping site (SITEQUAL)", *Quarterly Journal of Electronic Commerce*, Vol. 2 No. 1, pp. 31–45.

- Zhang, Y. and Wang, F. (2024), "Developments and trends in flow research over 40 years: A bibliometric analysis", *Collabra: Psychology*, Vol. 10 No. 1, pp. 1-17.
- Zhao, X., Lynch, J.G. Jr. and Chen, Q. (2010), "Reconsidering Baron and Kenny: Myths and truths about mediation analysis", *Journal of Consumer Research*, Vol. 37 No. 2, pp. 197–206.