

SHAPING TRUST AND LOYALTY IN ONLINE COMMERCE: AN EMPIRICAL STUDY OF INFLUENTIAL FACTORS

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ABSTRACT

There have been reported cases related to cybercrime carried out in E-commerce technology, with various types and methods of cybercrime used by these cybercriminals, such as identity theft and data transactions, unauthorized use of personal data, phishing and click-baiting, and payment fraud. This research aims to test a hypothesis centered on the impact of cybercrime and trust in using E-commerce technology from the consumer or user side. This research contributes to identifying what factors can affect user trust such as perceived qualities, privacy, security and satisfaction so that E-commerce implements its strategy to increase user loyalty. The survey was distributed to 444 respondents who had used e-commerce for shopping. The research results show that user satisfaction is influenced by information quality, system quality, and service quality. Trust is influenced by security, privacy, and satisfaction. The loyalty variable is influenced by trust. Meanwhile, satisfaction is not influenced by security and privacy.

Keywords: *E-commerce, Indonesia, Trust, Quality, Cybercrime, Loyalty*

1. INTRODUCTION

E-commerce, or electronic commerce, is a form of trading business. The difference lies in the medium in which E-commerce operates. E-commerce uses technology to operate, especially the Internet. E-commerce runs as an online option for companies or individuals to sell, advertise, and buy goods, products, or services without the need to physically meet and conduct physical transactions [1]. From the data gathered from iPrice, as of 2022, the total number of consumers visiting the E-commerce technology page in Indonesia is as high as 157.2 million visitations for Tokopedia and 132.8 million visitations for Shopee. As of 2022, the coordinating ministry of economy in Indonesia stated 108.54 trillion Rupiah worth of transactions made across E-commerce vendors in Indonesia.

Furthermore, as of 2021, the total transactions made increased by 9.4% compared to 2020 total transactions. E-commerce offers many advantages, such as the opportunity to run and expand a business from minor to large-scale, having the opportunity to expand their business, even as individuals start their businesses. Then, to cut costs (space costs and building rent because it does not require physical space to make transactions), a

higher competitive advantage in business with similar products or services, improve the effectiveness of business operations and improve the performance of financial processes, payments and faster transactions [2]. These are why E-commerce technology is widely used and proliferating, not only in Indonesia but also in the world at large. Also, the rapid development, inventions, and advances in the world of technology and the high use of the Internet contributed a lot to the widespread use and adoption of E-commerce technology.

However, in addition to the various advantages E-commerce technology offers and its rapid adoption by many users and businesses, the threat of cybercrime activities has also increased in E-commerce technology usage. Targeting users and business companies that use E-commerce technology, these criminals tried various attempts to abuse and exploit every vulnerability in E-commerce technology. According to a State Cyber and Code Agency report, there are approximately 700 million cybercrime-attacking victims and electronic business vendors as of July 2022. With various methods of deception, they try to engage the user to fall into their tricks and then benefit from the victim. There have been reported cases related to cybercrime

carried out in E-commerce technology, with various types and methods of cybercrime used by these cybercriminals, such as identity theft and data transaction, unauthorized use of personal data, phishing and click baiting, and payment fraud [3].

There are many cybercrime cases that occur in Indonesia, for example, cybercrime cases in Indonesia occurred in May 2020, namely a total of 1.2 million personal data of Bhinneka.com ecommerce users were leaked due to the actions of a group of hackers on the black market [4]. Cybercrime ecommerce cases in Indonesia also occurred in May 2020 at Tokopedia E-commerce. A total of 91 million active user accounts experienced data leaks and were sold to a dark web named empire market which sold for 74 million rupiah [5]. Some leaked data such as name, address, e-Mail, and cellphone number. These cybercrime activities continue to severely threaten E-commerce technology and affect consumers' intention to make transactions using E-commerce technology. These cybercrime actions directly and indirectly affect users who have not experienced or have been victims of cybercrime actions. The resulting impact of knowing that cybercrime acts exist or having experienced the cybercrime actions themselves can undermine users' trust and influence and change how they view E-commerce.

Based on the cybercrime actions described above, trust is one of the factors that may be affected by the cybercrime actions that occur. A user's trust may be affected if they hear that their friends, family, or others are victims of those cybercrime acts or experience the cybercrime act themselves [6]. Keep in mind that transactions made in E-commerce are carried out online; this means that the buyer may not know the seller and vice versa. Not having physical contact and not knowing each other, while only relying on E-commerce technology as an intermediary is one of the main factors used by cybercriminals to commit criminal acts; that factor is that because they do not know each other and it is not easy to track down cybercriminals. This can affect the reputation of E-commerce technology because users may be disappointed with E-commerce technology and refuse to use E-commerce technology, further resulting in E-commerce technology losing customers and may affect the finances and productivity of companies engaged in E-commerce technology [7].

On the other hand, the security system (referred to as just security) is the one that is affected by the cybercrime attacks that cybercriminals have done. Security issues remain crucial in the E-commerce industry since personal and financial

information can be intercepted and used for fraud and other criminal actions. Security incidents will only increase as consumers' demands to use the E-commerce technology grows. This leads to the definition of security in E-commerce as "the subjective probability with which consumers believe that their personal information will not be viewed, stored, and manipulated during transit and storage by inappropriate parties in a manner consistent with their confident expectations" [8]. This means the more secure the system is, the less likely a cybercrime act might occur, leading to a secured system. Secured systems can attract consumers since they do not need to worry about their data, which grows their trust and loyalty. At the same time, E-commerce vendor reputation is a factor relevant to ongoing trust formation and loyalty because it not only shows past solid performance by the E-commerce technology vendors but also suggests that the E-commerce technology vendors have not routinely faced security incidents.

In this study, research will be conducted on the impact of cybercrime on user trust and what affects user trust to use E-commerce technology. To measure what affects the use of E-commerce technology in cybercrime cases that occur and also with the trust of users of E-commerce technology. This study will show what can influence users to see and use E-commerce technology, based on the cybercrime that occurs, cybercrime that impacts the security systems, and how such cybercrime actions can affect their trust in the use of E-commerce technology, furthermore, affect their loyalty with the E-commerce technology.

Cybercrime are rampant in attacking E-commerce as previously mentioned. The existence of cybercrime that attacks e-commerce can reduce the trust of potential customers in using e-commerce technology [9]. User trust is crucial to an application's success, particularly in e-commerce. [10]. This paper contributes to identifying what factors can affect user trust such as perceived qualities, privacy, security and satisfaction so that E-commerce implements its strategy to increase user loyalty.

2. LITERATURE REVIEW

A literature review was conducted to support the content of the study. The literature is reviewed from previous works of researchers who have conducted research and observations from similar topics centered around the belief in the use of E-commerce technology, cybercrime in E-commerce technology, and trust in E-commerce transactions in

general. The literature that is reviewed is then to be presented as follows:

The first journal from [11] discussed the influence of customers' experience and trust in the brand on their impact on the customer's loyalty within E-commerce. Their research was conducted within one E-commerce brand, Lazada, with their respondent specified from West Nusa Tenggara (NTB). They proposed two variables to be researched towards customer loyalty: customer experience and brand trust. They used a non-probability sampling with the purposive sampling method, in which they collected 50 respondents, which they analyzed using multiple linear regression analysis. Their result shows that both variables positively impacted customer loyalty, in which the customer experience impacted partially and the brand trust impacted simultaneously.

The study of [12] researched loyalty, trust and user satisfaction in the online shop Tokopedia.com. This study examines user interface quality, information quality, perceived security risk, perceived privacy on customer trust and customer satisfaction. The results of the study found that these variables significantly influence customer satisfaction and trust. But customer satisfaction does not have a direct influence on loyalty. This paper provides the key that it is very important to maintain customer satisfaction and trust in e-commerce business. The author suggests that Tokopedia can improve payment security, improve the visual aspect of the platform, and increase the effectiveness of the search feature to maintain reputation and increase customer loyalty. The suggestion of this paper for future study is to diversify indicators of satisfaction, trust, and loyalty, as well as other potential variables such as price.

The next paper [13] that has examined the antecedents of trust and customer loyalty in online shopping, with a focus on the moderating effects of online shopping experience and e-shopping spending. It investigates the determinants of customer trust, including perceived ease of use, privacy concerns, perceived security, product variety, and on-time delivery. The study also investigates the part that customer trust plays in fostering loyalty and recurrent buying habits. It supports the hypothesis that the relationship between e-commerce platform qualities and customer trust and loyalty is moderated by online shopping experience and spending. The study offers insightful recommendations for e-retailers and regulators on how to foster consumer trust and loyalty when they shop online.

Next work from [14] researched the effect of service quality and feeling of trust on the loyalty of customers when they shop in E-commerce. Their research was conducted within one E-commerce brand, namely Shoppe, and the respondents targeted to be specifically students taking a major in management study at Muhammadiyah University in Bengkulu. They proposed two variables to be researched towards customer loyalty: service quality and trust. They used an accidental sampling technique and gathered 113 respondents, which they analyzed using multiple linear regression analysis, hypothesis t-test, and hypothesis f-test. Their result shows that both variables positively impacted the customer's loyalty, both partially and simultaneously.

Next work from [15] elaborated on the factors that affected the loyalty of customers of E-commerce in Indonesia. Their research was conducted specifically for E-commerce customers who had a repetition of buying from several E-commerce vendors, all of whom came from Indonesia. Their research proposed several variables simultaneously and partially impacting loyalty: service quality, satisfaction, marketing promotion, trust, and application design. Their research uses the hypothetico-deductive method to gather data, and they gathered a total of 323 respondents, which they analyzed using multiple linear regression analysis. Their result shows that only some variables positively impact one variable to another; service quality only positively impacts satisfaction and trust but not loyalty. Satisfaction has a positive impact on loyalty, while trust has no positive impact on loyalty. Marketing promotion has a positive impact on loyalty and satisfaction but not on trust, and application design has a positive impact on both satisfaction and trust.

Work from [16] conducted around the loyalty of E-commerce users within one city, namely Batam. Their research proposed several variables to be researched that are deemed to impact the user's loyalty, namely the service quality, trust, perceived value, security, privacy, and website design, all to be mediated by one variable, namely satisfaction. Their research uses the PLS-SEM method and gathers 360 respondents, then analyzes using multiple linear regression analysis. Their result shows that all but one variable partially influences loyalty through satisfaction; all variables positively impact satisfaction, except trust, which only has an effect on loyalty. Simultaneously, satisfaction has a positive impact on loyalty.

Next work from [17] researched the effect of service quality and trust on the satisfaction aspect

of users in one E-commerce in Indonesia, namely Tokopedia. Their respondents target users who live in one city, namely Bandar Lampung. Their research proposed two variables that impacted the user's satisfaction: service quality and trust. Their research uses non-probability sampling with purposive sampling techniques to gather data. They gathered 110 respondents that were analyzed using validity and reliability tests, multiple linear regression analyses, hypothesis t-test, and hypothesis r²-test. Their result shows that both variables positively and significantly impact users' satisfaction.

Work from [18] conducted on the factors that affected customer loyalty in E-commerce, using user satisfaction as the medium to analyze the factors. Their research was conducted at State University in East Java. Their research proposed two variables deemed impactful with loyalty, namely the service quality and the trust, that use satisfaction as a medium towards loyalty. Their research used purposive sampling to gather their data, and they gathered a total of 100 respondents, which were analyzed using descriptive analysis and the PLS method. Their result shows that both variables partially impact the satisfaction aspect, and the satisfaction aspect also partially impacts the loyalty aspect.

The next work from [19] discussed the factors that influence customers to be interested in purchasing goods from one E-commerce, namely AliExpress. The proposed factors deemed impactful with the buying interest are digital marketing, brand trust, and customer satisfaction. To gather respondents for their research, they used non-probability sampling using purposive sampling techniques to gather data. They gathered 147 respondents, and the data was analyzed with multiple linear regression analysis. Their result shows that all proposed variables positively impact the customer's buying interest.

Another work from [20] speaks about the impact of trust and satisfaction on user loyalty within E-commerce, as seen from the growth of usage during the COVID-19 pandemic. Their research proposed several deemed impactful variables, namely the e-coupon, information quality, and financial risk. These variables are used to determine the partial influence of the trust and satisfaction aspect on users' loyalty. This research used non-probability-quota sampling to gather data. They gathered 423 respondents and analyzed the data by using the SEM method. Their result shows that all but one variable has a positive and significant result towards satisfaction and trust. One variable that has no impact on trust and satisfaction is financial risk.

Both satisfaction and trust have a positive impact on the user's loyalty.

Work from [21] determines the impact of service quality, trust, and risk perception towards the repurchase intention mediated by satisfaction within the E-commerce application usage during the COVID-19 pandemic. This research was specified for their target respondents to come from one city, namely Jambi. This research proposed three variables that are deemed impactful with the repurchase intention: service quality, trust, and risk perception. All these variables will then be bridged with a medium variable, satisfaction. Their research uses non-probability sampling with a purposive sampling method to gather data. A total of 100 respondents were gathered and analyzed by using the PLS-SEM method. Their research result shows that all variables positively impact the satisfaction medium and repurchase intention, and the satisfaction variable positively impacts the repurchase intention, both partially and simultaneously.

Next work from [22] discussed the effect of service quality and trust on the customer's satisfaction within Lazada. Their research proposed two variables deemed impactful toward satisfaction: service quality and trust. Their research gathered data by using accidental sampling to gather data. They gathered 100 respondents and were projected using the explanatory regression analysis method. Their research result shows that both variables have a positive and significant impact on the satisfaction aspect of customers, both partially and simultaneously.

Work from [23] discussed factors that impacted the satisfaction and loyalty of customers of several E-commerce in Indonesia. This research aimed to gather insights specifically from users who purchased products from several brands within the E-commerce, namely Sociolla, Watsons, and Sephora. This journal proposed two variables influencing the loyalty aspect, namely the service quality and trust, to be bridged by a medium variable: satisfaction. This research used non-probability sampling to gather data from respondents and was able to gather a total of 150 respondents. The data is analyzed using the PLS-SEM method by the researcher and shows that, partially and simultaneously, those variables and the medium variables can positively impact customers' loyalty.

The next work from [24] was conducted around the effect of service quality, trust, brand image, and customer satisfaction on customer loyalty within Shoppe. Compared to other works, this one researched precisely one seller affiliate

within Shopee, Edwin Jeans. This research proposed four variables that are deemed impactful with customer loyalty: service quality, trust, brand image, and satisfaction. This research used a purposive sampling technique to gather data. The researcher gathered 100 respondents, and the data was analyzed using multiple linear regression analysis. Their research result shows that all the proposed variables positively impacted the loyalty of the customers of Edwin Jeans, both partially and simultaneously.

Another work from [25] researched the service quality of E-commerce towards customer satisfaction trust and the impact of those variables on customer loyalty. This research was conducted with the customers of Shopee E-commerce in Indonesia. Their research proposed three deemed impactful variables: service quality, satisfaction, and trust. This research used the purposive sampling technique to gather their data. Their research gathered a total of 300 respondents, and their data was processed by using causality analysis. Their research shows that all but one variable relation positively and significantly impacts loyalty. One variable relation that is not supportive is the partial effect of service quality on loyalty.

Work from [26] analyzed the effect of cognitive and affective trust regarding online customer behavior within E-commerce. This research proposed several variables that are deemed significant towards customers' loyalty within E-commerce, namely the perceived website quality, security, privacy policy, prior-interaction experience, perceived reputation, shared value, internet usage experience, and online shopping experience. Alongside these variables, several medium variables are used, namely cognitive trust, affective trust, and customer satisfaction. Their research used a purposive sampling technique to gather their data, in which they gathered a total of 373 respondents. They analyzed the data by using Kolmogorov-Smirnov test and SEM method. Their research result shows that all the variables and the medium have a positive and significant effect on their respective variables, all leading to a positive and significant impact on the loyalty intention of the customers.

Next work from [27] discussed the impact of service quality and brand image on customer loyalty in Shopee. This research was conducted specifically within one district in Indonesia, namely Pasar Gunungsitoli. This research proposed two variables that are deemed impactful with the loyalty of Shopee customers, namely the service quality and the brand image. They used purposive sampling techniques to gather their respondent's data and

gathered 140 respondents. This data will then be analyzed using descriptive statistics and SEM methods. Their result shows that brand image is the only variable that significantly and positively impacts loyalty.

Work from [28] Conducted around the factors determining the purchase intention of Batam City residents, especially gen-Z, regarding their purchase intention in E-commerce. This research explicitly aimed at Gen-Z residents in Batam City who had purchased a skincare product from E-commerce. Their research proposed several variables that are deemed impactful with the customers' purchase intention, namely the perceived quality, brand awareness, online communities, E-WOM (electronic word of mouth), and brand association. All these variables are then bridged with a medium variable, namely brand trust. This research used non-probability sampling as a technique to gather respondents. This research gathered 400 respondents, and the data is to be calculated using the PLS-SEM method. This research result shows that only two variables partially and simultaneously impact the purchase intention by using medium variables of brand trust, namely the perceived quality and brand association. On the other hand, brand awareness, E-WOM, and online communities did not significantly impact the brand trust and the purchase intention.

Another work from [29] discussed numerous factors that affected the usage of E-commerce and the loyalty of the customers that use the E-commerce technology during the COVID-19 pandemic. This research paper proposed several variables deemed impactful with the loyalty of the customers through several medium variables proposed to bridge the proposed variables. The proposed variables are perceived risk, performance expectation, effect expectation, social influence, facilitating condition, and E-commerce experience. The medium variables proposed are the use of E-commerce and E-commerce satisfaction. This research used a non-probability sampling technique and gathered 334 respondents, with the data to be analyzed using the SEM method to calculate the data. Their research shows the effect of expectation, social influence, and facilitating conditions on E-commerce use. E-commerce supported E-commerce satisfaction, and E-commerce satisfaction supported loyalty.

Work from [30] researched the factors that influenced the customer's satisfaction with their E-commerce usage within the COVID-19 pandemic. This research proposed several variables deemed impactful toward satisfaction: security, information

availability, shipping, perceived quality, price, time, and demographic characteristics (to impact statistically). This research used a sampling technique to gather their respondents and gathered 207 respondents' data that were analyzed using the SEM method to calculate the data. Their research result shows that shipping, price, and demographic characteristics didn't have any significant and positive impact on the satisfaction aspect of the customers.

Another work from [31] discussed about the effect of e-service quality and brand image towards the purchase decisions made by customers of Tokopedia E-commerce. This research was specifically aimed to students from Diponegoro University. This research proposed two variables to be researched, namely the e-service quality and the brand image. This research used non-probability sampling to gather their respondents, with a total of 100 data gathered, they calculated the data by using regression data analysis. Their research result shows that only the e-service quality that is deemed impactful with the purchase decisions made by their research target, the student of Diponegoro University.

Next work from [32] talks about the impact e-service quality has on e-loyalty through satisfaction as a medium. Their research was done explicitly towards customers who had shopped in Bukalapak E-commerce. Their research proposed one variable, namely the e-service quality, and the medium variable, namely the e-satisfaction, to be researched regarding their impact on the e-loyalty of customers. This research used non-probability sampling and purposive sampling techniques to gather data and collected 100 respondents to be analyzed using validity and reliability tests, correlation coefficient tests, coefficient of determination, simple regression analysis, multiple linear regression, hypothesis f-tests, hypothesis t-tests, and path analysis. Their research results show that the proposed variables have a positive and significant impact on loyalty, both simultaneously and partially.

3. THEORITICAL FOUNDATION

One journal is used as the primary reference, and several other journals are used as supporting secondary references to help understand and build this study component. The prominent journal used for reference is "Can Information Security, Privacy and Satisfaction Influence the E-commerce Consumer Trust?" compiled by Manuel Jesnico Girsang, Candiwan, Ratih Hendayani, and

Yuvaraj Ganesan in 2020 [7]. The journal uses a framework consisting of four variables: security, privacy, satisfaction, and trust. The variables of this journal and its framework are used as the basis for current research. Using their framework, we started to expand the framework by adding other variables that are significant to the research, namely the perceived qualities (information quality, service quality, and systems quality), with the addition of final output from the 'trust' variable, namely the 'loyalty' to indicate loyalty scale of the consumer of the E-commerce technology. The proposed research model is provided as follows:

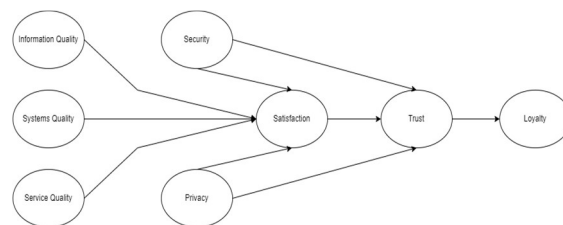


Figure 1: Research Model

The theoretical foundation used by this research is conducted from the primary references, as stated earlier. In their journal, they researched IT capabilities and IS success, where they tested whether the privacy and security aspects will affect the satisfaction and trust of E-commerce users [7]. In addition to supporting the theory, namely the IT capabilities and IS success, we added some other references, as stated earlier, namely the perceived qualities. The perceived qualities are compiled from other references with quality variables in common. The perceived qualities variables are used to differentiate this journal work from previous works focused on the perceived qualities relation with the satisfaction variable. Another variable added to this journal is the loyalty variable, with several journal works used as a reference to support this journal work and to differ from previous journal works.

4. HYPOTHESIS DEVELOPMENT

The hypothesis is formulated based on how many variables are used in this research. The variables used were based on the research model displayed in the previous part of this research. The hypotheses formulated from each variable are processed from a minimum of three journals containing at least one related variable relationship used in this research. The variable's hypothesis is as follows:

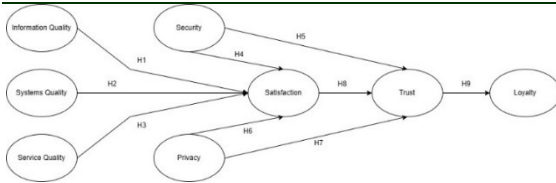


Figure 2: Research Model with Hypothesis

A. Information Quality

Information quality is a measure of value perceived by a customer of the output produced by a website. Moreover, the information an E-commerce platform provides can be divided into two parts in general. One is information about the product, and the other is about the service. The information about the products can be related to information provided for the product, ratings, feedback given by another purchaser, and related or similar products. In contrast, the information about the service can be related to the delivery and shipping information and the information regarding the E-commerce services [33]. In other previous works, it is stated that five components are adopted, namely completeness, ease of understanding, personalization, relevance, and security. These types of information are the basis of an E-commerce platform designed to support customer service and product searching. Other factors may include relevance, ensuring that the customer can foresee the use and quality of a product or service [34]. Information Quality are very important to use because they have a significant impact on trust and customer loyalty in E-commerce. [35], [36]. It is stated in other previous works that the information quality, as one of the characteristics of website quality, can influence the satisfaction of customers positively and significantly, and, in order for the information to satisfy the consumer's needs, it should be up to date for the products and services and easy to understand, providing the people with enough help so that they can make a reasonable choice [37]. Based on the explanation given, the journal proposed the following hypothesis:

H1: *Information quality has a positive impact towards satisfaction*

B. Systems Quality

Systems quality can be defined as something that reflects a website system's overall performance and can be measured by a customer's user-friendliness while shopping on an E-commerce platform. The features of the E-commerce platform's interface are an attractive medium for interaction between it and its customers. At the same time, it was

significantly influenced by the platform's interactivity levels [38]. Systems quality helps determine whether the platform is user-friendly, efficient, secure, and provides a seamless shopping experience. In the other previous works, it is stated that five components are adopted to indicate the system quality, namely adaptability, availability, reliability, response time, and usability [34]. Another journal stated that a good platform used by the consumer is related to sound quality, and systems quality is one of the three components of building a good platform used by the consumer [39]. Based on the explanation given, the journal proposed the following hypothesis:

H2: *Systems quality has a positive impact towards satisfaction*

C. Service Quality

Service quality can be determined as overall consumer evaluations and judgments regarding the quality of the E-commerce platform [38]. In another journal work, the quality of service provided to consumers using the E-commerce platform can be determined as another definition of service quality. A good quality of service based on the E-commerce platform makes customers feel more efficient in performing transactions in terms of time and cost. The availability of information and smooth transactions is an option for customers to transact through the availability of system facilities and adequate internet networks, as well as the guarantee of data confidentiality [40]. In the previous works, it is stated that three components are adopted, namely assurance, empathy, and responsiveness [34]. Another work stated that the quality of service can be defined as a continuous service process that provides up-to-date data regarding user needs, affecting the satisfaction and expectation of the E-commerce platform quality [39]. In other previous works, the journal defined service quality as the customers' overall impression of the relative inferiority/superiority of a service provider and its services and is often considered similar to the customer's overall attitude towards the company (in this journal specified to the E-commerce platform provider) [41]. Based on the explanation given, the journal proposed the following hypothesis:

H3: *Service quality has a positive impact towards satisfaction*

D. Security

Security refers to the customer's perception of the security of their transactions, namely payment options and the various mechanisms involved in entering, transmitting, and storage personal information, as a part of data protection in online transactions, and is recognized to be a fundamental component in E-commerce [33]. According to a study, customers' worries about using their credit cards, information security, and trust have an impact on how secure and trustworthy they perceive e-commerce applications to be [42]. Variable of security is important because it helps understand the impact of perceived security risk on customer trust and loyalty in e-commerce [35]. Another journal states that by having a proper security system within the E-commerce systems, the consumers can receive reassurance regarding their transaction and personal data given to the E-commerce platform, which makes consumers perceive trust, helping them to complete transactions without feeling worried or scared with the risks that might happen. This research work also stated four critical aspects of security: authentication, confidentiality, integrity, and non-repudiation [43]. Another journal stated that the two factors that significantly contribute to the success of an E-commerce platform provider are the trust people place in the E-commerce itself and how secure they feel when doing business transactions within that E-commerce. This journal also highlighted that security concerns are one of the reasons why people do not do transactions within E-commerce, which means that concerns are also connected with their lack of trust in using E-commerce. Thus, the role of perceived security as a trust antecedent is nothing to be doubted [6].

On the other hand, the security aspect within the E-commerce platform did not just impact the consumer's perceived trust. However, the satisfaction aspect, since the higher the level of perceived security, the more likely it is that a consumer will initiate a purchase on the respective E-commerce platform. Therefore, consumers will continue using the E-commerce platform, which they consider highly secure. The higher the level of security a platform can offer, the greater the customer satisfaction level will be, which underlines how much security contributes to customer satisfaction [33]. Another journal states that customer satisfaction in E-commerce is determined by various work attributes, including security and privacy [7]. In another journal work, security via trust of usage by the consumer is considered as an encouragement in various transactions between sellers and buyers for satisfaction consumers desire.

Therefore, if the consumer is satisfied, the consumer will believe in the company's competence, reliability, and honesty, showing that trust in the security aspect can significantly affect consumer satisfaction [44]. Based on the explanation given, the journal proposed the following hypothesis:

H4: *Security has a positive impact towards satisfaction*

H5: *Security has a positive impact towards trust*

E. Privacy

Privacy concerns consumers' feelings about E-commerce platform providers collecting, storing, and using individual data. Most consumers are concerned about how their data is being stored and used by the provider since there are possibilities that the provider might use their data for their benefit or destructive purposes. Many consumers are reluctant to provide their personal information or data because they fear the company will misuse it, which is an important asset to protect. It must be highly guarded by the company because information leakage and system failure can harm the finances and productivity of the company, which leads to loss of consumer trust, change of public view towards the E-commerce platform, and increased dissatisfied consumers [7]. The protection of personal information and the degree of individual control over its gathering and use are referred to as privacy. Customers require reassurance that their personal information will be handled safely and that their privacy will be protected in the context of online commerce. Customers' pleasure and loyalty to an e-commerce platform may be affected when they believe there is a lack of privacy or that their personal information is at risk. So, by looking at the privacy variable, researchers can better understand how privacy concerns affect trust and loyalty as well as find ways to improve privacy protection in e-commerce. Another work stated that privacy is an essential factor for consumers while online shopping within an E-commerce platform, which defined privacy as the user's protected data. At the same time, they interact with the E-commerce platform, ensuring that the transactions and personal data are secured and their privacy is protected.

Further definition of privacy in online transactions is a trade-off between certain benefits and the online consumer's private information, which refers to the consumer's personal information inputted into the E-commerce platform. This is important because customer concerns include not only how this personal information is collected but

also their lack of control over how their information may be used is going to be used by the platform provider or any parties involved within them [33]. Other works have stated that the more privacy an online E-commerce shopping platform can provide, the more likely the customer will get a satisfactory experience [45]. Another journal article stated that the handling of privacy needs to refer to the protection of various types of data collected during interactions between consumers online, which is essential to increase consumer satisfaction [44]. Based on the explanation given, the journal proposed the following hypothesis:

H6: *Privacy has a positive impact towards satisfaction*

H7: *Privacy has a positive impact towards trust*

F. Satisfaction

Customer satisfaction is a pleasure (or disappointment) consumers feel after comparing the result or initial product with their expectations. Various other attributes determine satisfaction in online stores within the E-commerce platform, including the one explained before, the security and privacy aspects [7]. In previous works, it is stated that customer satisfaction is the customers' evaluation of a product or service in terms of whether that product or service has met their needs and expectations. Satisfied customers tend to have higher service usage, stronger repurchase intention, and are often eager to recommend the product or service to their acquaintances than those who are unsatisfied [46]. Furthermore, from other research, dissatisfied customers are more likely to search for alternative information and switch to another retailer or vendor and are more resistant to developing a close relationship with the new retailer or vendor. From that explanation, we can conclude that customer satisfaction is closely related to interpersonal trust and is considered an antecedent of trust [47] and we want to understand how satisfied customers are more likely to trust the platform and turn into loyal customers, which will raise sales and ensure the long-term sustainability of the e-commerce. Based on the explanation given, the journal proposed the following hypothesis:

H8: *Satisfaction has positive impact towards trust*

G. Trust

Trust affects the customers' view towards the E-commerce platforms they use. By feeling trust within the E-commerce platforms, they will feel

comfortable and confident when shopping at the E-commerce platform, thus making them continue to shop on the same site, causing higher user loyalty. Trust reduces customer uncertainty, and vulnerability in the service context is not tangible when using the E-commerce platform [40]. Other works stated that customer loyalty within the E-commerce platform would not occur without customer trust. Customer interactions are based on trust, which has a direct impact on customer loyalty and satisfaction. Trust gets more important in the situation of e-commerce because buyers and sellers cannot meet in person. The more customers trusted a particular web merchant, the less likely they would switch to another merchant. Even if another merchant offers better deals, they will be more willing to purchase from a website merchant that they trust [37]. Another work also defined trust as the degree of confidence or certainty the customer has in exchange options (degree of confidence customers have in online exchanges or the online exchange channel in terms of E-commerce platform). The journal also stated that customer trust impacts loyalty, defined as a customer's desire to maintain a valued relationship with the E-commerce platform. At the same time, they consider customer trust another important antecedent of loyalty [46]. Based on the explanation given, the journal proposed the following hypothesis:

H9: *Trust has a positive impact towards loyalty*

5. RESEARCH METHODOLOGY

Data were obtained through a Google form questionnaire and shared through the internet. The items used were adjusted from variables from the proposed research model. This survey contains two areas. The first segment concerns the respondent's data; the last is the variable's item on the developed research. The survey's link was made available to be filled by the public and was shared on different social media and online couriers like WhatsApp, Facebook, and Line. The research methodology used in this research journal is a quantitative method for data collection. Quantitative data collection methods were obtained through questionnaire surveys distributed to respondents, specifically the users of E-commerce technology. They were proven to be able to provide meaningful input for this research. The questionnaire answers were stated on a Likert scale, where 1 expressed strong disapproval, 2 expressed disapproval, three stated neutral, four expressed agreements, and five expressed strongly agree. Each question in the questionnaire is more of

a statement than an actual question (excluding the first segment, which is the general part of the questionnaire). The output that was collected is differentiated from the first segment to the last segment, with the purpose of the separation for a more accessible analysis and calculation of data.

For this research, the data's computation and processing would be done using a PLS calculation program, namely the SmartPLS 3.0. SmartPLS 3.0 was used to process and calculate the data inputted from the questionnaire respondents. SmartPLS 3.0 uses Partial Least Square Structural Equation Modeling (PLS-SEM) to evaluate the hypothesized model. The PLS-SEM is a statistical technique that allows researchers to simultaneously test and estimate a hypothesized relationship in a given conceptual model to establish the possible correlation between dependent and independent variables, thus effectively observing the relationship between latent variables [2].

6. RESEARCH RESULTS AND DISCUSSIONS

A. Demography

Specific samples from the public that were willing to fill out the questionnaire survey and gave meaningful answers were selected, with 444 respondents from Indonesia that uses E-Commerce, that is involved in answering the questionnaire. Their answers are then gathered and analyzed using the PLS program to study the proposed research model since this research's hypothesis is to define the relationship of each variable and predict the variable's relationship strength. The PLS method also provides a precise calculation of the questionnaire results, which helped us to study the importance of each indicator within the variables, which can be used to solve weak relationships and strengthen the relationship result, as well as practical contribution [7].

Based on the data collected and explained before, the total of eligible respondents with the answers is summed to a total of 444 respondents. The statistic reports in the following table contain the data from respondents who completed the questionnaire. The information regarding the respondents is as follows, divided by each category:

Table 1: Respondent's Profile

Age		
Characteristic	Frequency	Percentage (%)
10-25	435	97.97%
26-41	6	1.35%
42-57	3	0.68%

Gender		
Characteristic	Frequency	Percentage (%)
Male	111	25%
Female	333	75%

Education		
Characteristic	Frequency	Percentage (%)
SMA or Equal	245	55.18%
Diploma or Equal (D1 - D3)	4	0.9%
S1 or Equal	192	43.24%
S2 or Equal	2	0.45%
S3 or Equal	1	0.23%

Occupation		
Characteristic	Frequency	Percentage (%)
Students or College Students	433	97.52%
Employee	6	1.35%
Housewife	4	0.9%
Entrepreneur	1	0.23%
Lecturers	0	0

Domicile		
Characteristic	Frequency	Percentage (%)
Outside Java	124	27.93%
Jakarta	49	11.04%
Bogor	5	1.13%
Depok	4	0.9%
Tangerang	65	14.64%
Bekasi	10	2.25%
Outside Jabodetabek (still in Java)	187	42.12%

How often do you use E-commerce platform to shop?		
Characteristic	Frequency	Percentage (%)
1-3x transactions per week	384	86.49%
4-6x transactions per week	53	11.94%
More than 6x transactions per week	7	1.58%

How much do you spend on E-commerce platform?		
Characteristic	Frequency	Percentage (%)
Less than Rp. 500.000 per week	395	88.96%
Rp. 500.000 - Rp. 2.000.000	47	10.59%

More than Rp. 2.000.000 per week	2	0.45%
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What E-commerce platform do you use?		
Characteristic	Frequency	Percentage (%)
Tokopedia	223	50.23%
Shopee	414	93.24%
Lazada	52	11.71%
Bukalapak	17	3.83%
Blibli	14	3.15%
JD. ID	22	4.96%
Others	18	4.05%

The tables above display the frequency of answers from every category, alongside the percentage of total respondents from the questionnaire answers. From the tables, we can see that the majority of the respondents are between the ages of 10 and 25, with a percentage of 97.97%. The majority of the respondents are female (75%), with the majority of their last education being in high school (SMA) or equal, with a percentage of 55.18%, with the majority of their current occupation is students or college students with a percentage of 97.52%. Most respondents live within Java Island but not in the Jabodetabek area, with a percentage of 42.12%.

For their transactions in the E-commerce platform, most respondents did between 1 to 3 transactions per week, with a percentage of 86.49%. In contrast, the majority of the respondents spent less than Rp. 500.000 per week for their transactions, with a percentage of 88.96%. Lastly, the E-commerce platform used mainly by the respondents is Shopee, with a percentage of usage of 93.24%, followed by Tokopedia, with a percentage of usage of 50.23%. This result shows that the majority of respondents are using Shopee and Tokopedia.

B. Measurement Model

Measurement models are displayed in the convergent validity table, which contains the Average Variable Extracted (AVE), loading factors, and composite reliability. These are used to indicate the factor loadings to be acceptable. Here are displayed the convergent validity for the questionnaire's computation results:

Table 2: Convergent Validity

Variable	Item	Loading Factor	Composite Reliability	AVE
Information Quality	IQ1	0.824	0.786	0.647

	IQ2	0.784		
Systems Quality	SQ1	0.790	0.782	0.643
	SQ2	0.813		
Service Quality	SerQ1	0.765	0.813	0.592
	SerQ2	0.797		
	SerQ3	0.746		
Security	Sec1	0.802	0.782	0.643
	Sec2	0.801		
Privacy	Pri1	0.879	0.858	0.751
	Pri2	0.855		
Satisfaction	Sat1	0.824	0.797	0.663
	Sat2	0.804		
Trust	Tr1	0.805	0.795	0.565
	Tr2	0.718		
	Tr3	0.730		
Loyalty	Lyt1	0.849	0.810	0.680
	Lyt2	0.800		

As we can see from the tables displayed above, it can be seen that the AVE value of each indicator is already over 0.5. The outer loading (composite reliability) is already over 0.7 [44], indicating that the variables' convergent validity is valid. Hence, there is no need for further estimation, and this result indicates that the convergent validity is declared valid.

The other measurement model, namely the discriminant validity, is also displayed in the following table. Discriminant validity contains a squared root of the AVE shaped in a diagonal pattern, with another correlating coefficient outside the diagonal. The discriminant validity table displayed below is based on the Fornell and Larcker Criterion, with the diagonal pattern (square root of AVE) written in bold.

Table 3: Discriminant Validity

	Informat ion Quality	Loyal ty	Priva cy	Satisfact ion	Secur ity	Servi ce Quali ty	Syste ms Qualit y	Tru st
Informat ion Quality	0.805							
Loyalty	0.327	0.825						
Privacy	0.259	0.249	0.867					
Satisfact ion	0.443	0.416	0.293	0.814				
Security	0.232	0.246	0.521	0.245	0.802			
Service Quality	0.338	0.304	0.362	0.463	0.328	0.770		
Systems Quality	0.370	0.301	0.315	0.450	0.231	0.440	0.802	
Trust	0.431	0.340	0.508	0.430	0.401	0.547	0.501	0.752

Based on the discriminant validity table displayed above, all the variables are deemed valid since every number diagonally written in bold has a square root value from the AVE, while the numbers below the diagonal do not exceed the value in the diagonal.

Table 4: Cross Loading

	Information Quality	Loyalty	Privacy	Satisfaction	Security	Service Quality	Systems Quality	Trust
IQ1	0.824	0.233	0.140	0.372	0.125	0.286	0.300	0.308
IQ2	0.784	0.296	0.284	0.340	0.255	0.258	0.296	0.391
Lyt1	0.274	0.841	0.241	0.348	0.239	0.243	0.246	0.298
Lyt2	0.266	0.804	0.164	0.339	0.162	0.260	0.251	0.262
Pri1	0.222	0.209	0.879	0.273	0.455	0.326	0.264	0.453
Pri2	0.228	0.223	0.855	0.233	0.448	0.327	0.274	0.428
SQ1	0.335	0.262	0.312	0.351	0.219	0.279	0.404	0.151
SQ2	0.261	0.222	0.195	0.369	0.153	0.481	0.303	0.389
Sat1	0.349	0.332	0.255	0.824	0.231	0.433	0.303	0.372
Sat2	0.373	0.334	0.222	0.804	0.166	0.340	0.303	0.277
Sec1	0.146	0.176	0.469	0.133	0.802	0.321	0.303	0.360
Sec2	0.226	0.217	0.367	0.259	0.801	0.215	0.202	0.382
Ser	0.293	0.244	0.234	0.362	0.298	0.733	0.404	0.131
Ser Q1	0.253	0.195	0.315	0.356	0.244	0.976	0.276	0.407
Ser Q2	0.234	0.268	0.288	0.349	0.214	0.740	0.404	0.431
Tr1	0.317	0.242	0.444	0.372	0.319	0.443	0.808	0.051
Tr2	0.301	0.228	0.328	0.281	0.283	0.337	0.707	0.181
Tr3	0.354	0.305	0.365	0.310	0.296	0.317	0.307	0.301

C. Structural Model

The tables displayed below explain this research’s proposed framework model hypothesis (H1 - H9), which also includes the graphic portrayal of the framework. The tables alongside the framework model are displayed as follows:

Table 4: Path Coefficient

Hypothesis	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values	Results
Information Quality -> Satisfaction	0.256	0.260	0.048	5.374	0.000	Accept
Privacy -> Satisfaction	0.053	0.054	0.045	1.191	0.234	Reject
Privacy -> Trust	0.345	0.342	0.046	7.513	0.000	Accept
Satisfaction -> Trust	0.293	0.295	0.046	6.350	0.000	Accept
Security -> Satisfaction	0.024	0.021	0.047	0.505	0.614	Reject
Security -> Trust	0.149	0.152	0.049	3.019	0.003	Accept
Service Quality -> Satisfaction	0.251	0.253	0.049	5.088	0.000	Accept
Systems Quality -> Satisfaction	0.222	0.221	0.051	4.377	0.000	Accept
Trust -> Loyalty	0.340	0.340	0.041	8.290	0.000	Accept

Based on the path coefficient computation given, we can conclude that from 9 proposed hypotheses, there are two rejected hypotheses,

namely the Privacy => Satisfaction (H5) and the Security => Satisfaction (H4), meaning that they have adverse effects, thus are rejected, and were not supported.

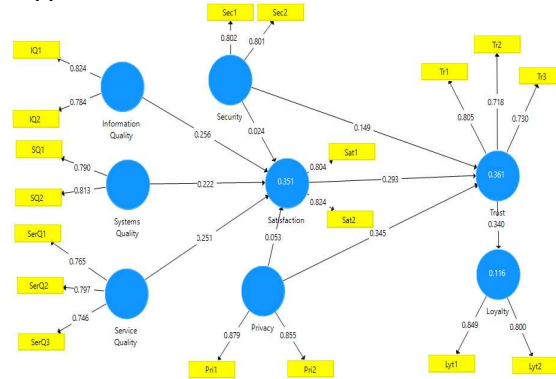


Figure 2: Research Model with Factor Loadings

D. Discussion

Based on the structural model displayed earlier, it is supported that the H1, Information quality has a positive impact towards satisfaction, is proven accepted, meaning that the information quality significantly impacts the satisfaction. This hypothesis is in line with previous works used as a reference [6, 9, 15], which also accepts the hypothesis. For the H2, Systems Quality has a positive impact on satisfaction; it is also proven accepted, meaning that the system's quality significantly impacts satisfaction. This hypothesis is in line with previous works used as a reference [6, 10, 14], which also accepts the hypothesis. For the H3, Service quality has a positive impact on satisfaction; it is also proven accepted, meaning that service quality significantly impacts satisfaction. This hypothesis is in line with previous works used as a reference [6, 10, 12, 13, 14], which also accepts the hypothesis. Based on the explanation given, from the perceived quality aspects, it is proved that all three qualities are significant factors influencing the satisfaction aspects of the consumer using E-commerce technologies.

For the H5, Security has a positive impact towards trust; it is proven accepted, meaning that security significantly impacts the trust aspects. This hypothesis aligns with previous works used as a reference [1, 5, 15], which also accepts the hypothesis. Aligned with H6 and H7, Privacy positively impacts trust and is also proven accepted. This hypothesis is in line with previous works used as a reference [8, 15], which also accepts the hypothesis. This proves that the privacy and security

aspects guaranteed within the E-commerce technologies affect the consumer's trust towards the E-Commerce technologies.

For the H8, Satisfaction positively impacts trust; it is proven accepted, meaning that the satisfaction aspect influences the trust aspect of E-Commerce technology users. This hypothesis aligns with previous works used as a reference [3, 8, 18], which also accepts the hypothesis. This proves that satisfied consumers would be more likely to trust the E-Commerce technology vendors.

For the H9, Trust positively impacts loyalty; it is proven accepted, meaning that trust impacts the loyalty aspect of the E-commerce users. This hypothesis aligns with previous works used as a reference [3, 9, 12], which also accepts the hypothesis. This proves that consumers who trust the E-commerce technology and are satisfied will be likelier to stay loyal and keep using the desired E-commerce technology vendors.

In contrast with the accepted hypothesis, two hypotheses are rejected, namely H4, Security has a positive impact towards satisfaction, and H6, Privacy has a positive impact towards satisfaction. On the contrary, after the data collection and computation, these hypotheses were rejected, meaning they did not significantly impact the correlated variable, namely the satisfaction aspects. However, one of the journals references [7] that is used to build the arguments for the hypothesis in this journal also has the same result that shows that privacy and security aspects are found to be weak determinants for the satisfaction aspects, which is mainly caused by the importance priority since the respondents preferred the privacy and security aspect for the E-commerce technology trusts are more critical compared to the E-commerce technology satisfaction. In this journal's works, both variables adversely affect the Satisfaction aspect. This may be caused by most respondents answering the questionnaire not using the E-commerce technology that often (proved by most of the respondents only do an average of 1 to 3 purchase transactions per week within E-commerce technology, with total transactions made per week is only Rp. 500.000 or less).

7. CONCLUSION

This research paper examines how cybercrime acts, mainly attacking the security aspect of E-commerce technologies, will affect consumers' trust. This study shows that perceived quality

(information quality, systems quality, and service quality) has a direct and positive impact on the satisfaction of consumers. Alongside the privacy and security aspects that directly affect the consumer's trust, satisfied consumers do affect the consumer's trust, which leads to a loyal consumer. On the other hand, the privacy and security aspects have no significant positive effect on consumer satisfaction. Some implications can be explained in the E-commerce technology research that is:

1. The perceived quality of the E-commerce technology influences the consumer to use the E-commerce technology, with a reasonable perceived quality that would significantly impact the consumer's satisfaction.
2. The privacy and security aspects of E-commerce determine the trust factor that the consumer has. The consumer will trust the E-commerce technology vendors if they have excellent and robust privacy and security aspects.
3. The satisfied consumers would lead to a consumer that trusts the E-commerce technology, which leads to a loyal consumer.
4. The privacy and security aspects that have no positive impacts on satisfaction indicate that privacy and security are not necessarily connected to the satisfaction of consumer's usage of E-commerce technology, compared to the perceived qualities that positively impact E-commerce technologies.

From the literature review and the results of this research, user trust is one of the keys to increasing loyalty in e-commerce. Efforts to build trust in users can be made in several ways. It has become mandatory for e-commerce to provide the best quality to make customers feel satisfied. The quality referred to in this research is the ability of an e-commerce platform to provide a reliable system, present appropriate information, and meet user service expectations. When users are satisfied, it can enhance a good company image and ultimately help expand market reach.

This research also found that users will trust an e-commerce platform if their privacy is maintained. Privacy gives users a sense of security and freedom to explore without feeling watched or judged. In this case, privacy also creates confidence that personal information will not be misused. When an e-commerce company is committed to ethical values and user security, users will feel respected

and have their privacy protected, thereby building a foundation of trust.

Talking about security, this research also proves its relationship with trust. E-commerce is in a digital world where various online security risks are a concern for many people. Some risks include fraud, identity theft, sensitive data being misused, and other cyber-attacks. This is a concern for customers when using e-commerce because the impact can be detrimental to them. When e-commerce can provide user protection from security threats, users can trust the platform.

Even though this research shows that security and privacy do not affect user satisfaction, it is important for an e-commerce platform to maintain ethical values and user security. These ethical and security values are the basis for building user trust. So, by providing quality, security, privacy and trust, this will have a big impact on loyal e-commerce users. Maintaining user loyalty is a way to build long-term relationships that are beneficial for business.

Loyal customers tend to return to make purchases on the platform and increase revenue significantly. When users feel comfortable with a platform, there is a high probability that they will leave positive reviews and recommend e-commerce to others because of the positive user experience. These reviews and recommendations can help companies to get potential new customers. A good company image is an advantage to survive amidst fierce e-commerce competition. Potential new customers will prefer a company that has a positive image, and old/loyal users will continue to choose that brand over other options. Therefore, user loyalty is something that has a big influence on companies, and e-commerce needs to build a business strategy that can increase user loyalty.

8. LIMITATIONS AND FURTHER STUDIES

This research is limited, mainly from the questionnaire respondent's data collection method. This is caused by the respondents filling the questionnaire, who are not mainly active buyers or spend quite a few moneys within each transaction, which shows that most of the respondents only did 1 to 3 transactions per week, spending less than Rp. 500.000 per week. On the other hand, they still give meaningful input since they are primarily students and still have a teenager age, ranging between 10 to 25 years old, who mostly understands the workflow or how the E-commerce technology works.

Based on the limitations that have been mentioned, future research needs to focus on making

restrictions on respondents who are not active buyers or buyers who spend significant amounts of money in order to provide a comprehensive understanding of the impact of user trust on e-commerce. In this study, the respondents involved were mainly teenagers and students, so future research can also expand the age range of respondents in order to explore how age affects user trust and the impact of cybercrime on different age groups.

For further study, it is possible that the total number of respondents will be increased, and more variation questions, as well as expand the frameworks of research, meaning that the current framework may be added with more variables and their respective items in order to analyze different aspects or different parts of the framework. Another possibility is using the framework from a different approach, which might give different outputs or perspectives on the same problems.

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