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Understanding Consumer Purchase Intention in Cloud Gaming: The Role of Perceived Risk, Ease of Use, and Trust

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ABSTRACT

Purpose— This study aims to examine the influence of perceived ease of use, perceived risk, and consumer trust on purchase intention in cloud gaming services, specifically in the Indonesian market. As cloud gaming continues to evolve, understanding consumer behavior in this sector is essential for improving service adoption and market penetration.

Design/methods/approach–This research employs a quantitative approach using Partial Least Squares Structural Equation Modeling (PLS-SEM) to analyze relationships among variables. Data were collected from cloud gaming users and processed using SmartPLS 3.3.2 to assess direct and indirect effects.

Findings–The results indicate that perceived risk has a significant positive effect on purchase intention ($\beta = 0.620$, $p < 0.05$), suggesting that consumers are still willing to subscribe despite acknowledging potential risks. Meanwhile, perceived ease of use does not have a significant impact on purchase intention ($\beta = -0.024$, $p > 0.05$), indicating that ease of use is not a primary determinant in consumer decision-making. Additionally, consumer trust has a positive but weaker effect ($\beta = 0.278$), showing that while trust is relevant, risk perception remains the dominant factor influencing purchase decisions.

Research implications/limitations—This study provides practical insights for cloud gaming providers by emphasizing the importance of risk mitigation strategies such as improving network stability, ensuring data security, and enhancing service transparency. However, this research is limited to one cloud gaming platform (Skyegrid), restricting generalizability to other providers. Future studies should explore comparative analyses across multiple cloud gaming services and consider additional variables such as pricing models, content variety, and user engagement strategies.

Originality/value–This study contributes to the growing body of knowledge on technology adoption and consumer behavior in digital entertainment services, particularly in the cloud gaming industry. By focusing on the Indonesian market, it provides empirical evidence on how perceived risk, ease of use, and trust shape purchase intention, offering valuable insights for academics, marketers, and business strategists seeking to enhance consumer adoption of cloud gaming services.

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Introduction

In the millennium era, the internet has evolved beyond a mere information exchange platform, becoming a complex ecosystem that significantly influences people's lives. This transformation has driven society toward a digital, fast-paced, and flexible lifestyle, where many physical objects and activities have been replaced by electronic and cloud-based alternatives. The adoption of digital technology has also contributed to a substantial reduction in paper usage, further reinforcing the shift toward a digital-first world.

The rapid growth of internet users worldwide has further accelerated this digital transformation. The highest number of users is recorded in China, India, and the United States, with Indonesia ranking fourth, reaching 171.26 million users as of December 2019. Indonesia's internet user base is projected to grow by 10.2% in 2021, making it one of the fastest-growing digital markets globally. This rapid adoption of internet technology has had a profound impact on multiple industries, including the gaming sector, which has experienced exponential growth since the second half of the 20th century.

The gaming industry generates revenue through the sale of consoles, games, accessories, merchandise, and services, forming a synergistic relationship between developers, publishers, and manufacturers. According to Newzoo Analytics, the gaming industry generated USD 137.9 billion in 2018, increasing to USD 151.98 billion in 2019. This figure was expected to reach USD 165.9 billion in 2020 and USD 180.1 billion in 2021, with the mobile gaming sector being the largest contributor at 26.8% of total revenue.

Indonesia is one of Southeast Asia's largest e-sports markets, with 43.7 million active players contributing USD 879.7 million in revenue in 2017. This makes Indonesia the 16th largest gaming market globally (Newzoo, 2018). At the regional level, Indonesia leads in gamer population, with 34 million gamers as reported by The ASEAN Post. However, the growth of e-sports in Indonesia is highly dependent on the availability and quality of internet infrastructure.

The Indonesian Telecommunications Regulatory Agency (BRTI) reported that the average internet speed in Indonesia is 15.5 Mbps for fixed broadband and 10.5 Mbps for mobile connections. In major cities like Jakarta, the 4G LTE download speed averages 15.1 Mbps (Bisnis.com, 2019). However, internet distribution remains uneven, with 4G signal coverage reaching 97.51% of settlements but only 52.28% of total regions. Additionally, mobile internet latency varies significantly, with North Maluku recording the highest latency (116ms) and Banten the lowest (33ms). For fixed broadband, Gorontalo has the highest latency (38ms), while East Kalimantan has the lowest (16ms).

The COVID-19 pandemic further accelerated the shift toward cloud gaming, with increased adoption trends observed globally. Newzoo Analytics reported that the cloud gaming industry generated USD 170 million in 2019, with projections reaching USD 584.7 million in 2020 and USD 3.2 billion in 2023 (Fortune.com). Cloud gaming leverages cloud computing technology, offering flexibility and cost efficiency (Wildana, Faiq, 2020). This platform has several advantages, including eliminating the need for high-end gaming devices, reducing hardware maintenance costs, and providing better digital security against piracy (Saeed, 2020).

Traditionally, gaming involves processing input through a controller, which is then rendered by the device's graphics processing unit (GPU). The quality of rendering is highly dependent on the capabilities of the user's hardware. In cloud gaming, the graphics processing is handled by server-side rendering, allowing users to play high-quality games on low-spec devices, provided they have a stable internet connection (Purbla, Nanda, 2020). However, high latency remains a significant challenge, as it can cause delays in player controls, disrupting the gaming experience (Griwlodz, 2020).

Beyond connectivity issues, consumer reluctance to adopt cloud computing services poses another challenge. Rully Moulany, Country Manager of Red Hat Indonesia, noted that users hesitate to switch cloud providers due to migration difficulties, which results in vendor lock-in situations (Infokomputer.grid.id). Rolly Edward, Founder of Skyegrid, stated that Indonesia's cloud gaming market remains stagnant due to uneven internet infrastructure, high costs of AAA game licenses, and limited cloud adoption strategies. Even global cloud gaming services face difficulties, with Google Stadia struggling with performance constraints and NVIDIA GeForce Now losing publisher support (Hybrid.co.id).

Given these challenges, the success rate of cloud gaming adoption remains higher in developed countries with more advanced internet infrastructure. However, as Indonesia continues to expand its 5G infrastructure, there is a potential for significant market growth in the cloud gaming sector. This study aims to explore the current state of Indonesia's cloud gaming industry, its challenges, and future opportunities, particularly in relation to internet infrastructure, consumer adoption, and market potential.

Methods

This study adopts a quantitative research approach to examine consumer perception and buying interest in cloud gaming services, particularly Skyegrid users in Indonesia. The research utilizes the Technology Acceptance Model (TAM) framework to analyze the perception of convenience, risk perception, and consumer trust as key factors influencing buying interest in cloud gaming services. The study employs path analysis using SmartPLS 3.3.2 software for data processing and hypothesis testing.

Theoretical Foundation

According to Kotler & Keller (2016:27), marketing is the process of identifying and fulfilling consumer needs that can generate mutual benefits for both companies and consumers. In the context of cloud gaming services, consumer perception plays a crucial role in determining adoption rates and market success. Schiffman and Kanuk (2020) define perception as the process through which individuals select, organize, and interpret stimuli to form a meaningful and coherent understanding of their environment. In the case of cloud gaming, user perception influences how consumers evaluate the convenience, risks, and trustworthiness of the service.

Technology Acceptance Model (TAM) Approach

One of the most widely used frameworks for assessing technology adoption is the Technology Acceptance Model (TAM). Developed by Davis (1986) in Safitri (2016), TAM seeks to understand the factors influencing user acceptance of technology. A key concept introduced by TAM is perceived ease of use, which significantly affects users' attitudes toward technology adoption. This model provides a simple yet powerful explanation for predicting user acceptance and behavioral intentions toward new technology, including cloud gaming services.

Research Variables

1. Perception of Convenience

According to Davis (1989) in Hairi (2020), perceived ease of use (PEOU) is defined as the extent to which a person believes that using a new technology or system will be free from effort or difficulty. In the context of cloud gaming, PEOU refers to how easily users can access, understand, and operate cloud-based gaming platforms.

2. Risk Perception

Risk perception refers to an individual's assessment of the possible risks associated with a transaction or service. A higher perceived risk can negatively impact user adoption and purchasing decisions. In cloud gaming, risks include data security, service reliability, and financial commitment in subscription-based gaming platforms.

3. Consumer Trust

Trust plays a vital role in online transactions and technology adoption (Kevin, 2020). In cloud gaming, consumer trust is shaped by users' confidence in the developer's ability to provide a secure and reliable gaming experience. The level of trust influences whether consumers are willing to commit to long-term usage of cloud gaming services.

4. Buying Interest

Buying interest is a psychological tendency that influences a consumer's likelihood of purchasing a particular product (Schiffman & Kanuk, 2009 in Hasibuan, 2020). In the context of cloud gaming, a high level of buying interest increases the probability of consumer engagement and subscription to cloud gaming platforms.

Research Design

- Measurement Scale: This study employs a Likert scale to measure respondent perceptions of each research variable.
- Population: The research targets Skyegrid cloud gaming users in Indonesia.
- Sampling Technique: The study applies non-probability sampling, specifically purposive sampling, to select respondents who have experience using cloud gaming services.
- Data Collection Tools: Structured online questionnaires were used to gather data from respondents.

Data Analysis Technique

The research employs path analysis using SmartPLS 3.3.2 software to examine the direct and indirect relationships between perception of convenience, risk perception, consumer trust, and buying interest in cloud gaming services. This analytical approach enables a comprehensive assessment of the factors influencing consumer decision-making in adopting cloud gaming technology.

Result

Demographic Analysis

The demographic analysis provides insights into the characteristics of respondents in this study. The findings indicate that:

- All participants in the sample have used or subscribed to Skyegrid's cloud gaming application.
- 68.0% of respondents were male, while 32.0% were female.
- In terms of age distribution, 54% of respondents were aged 21–30 years, 38% were aged 41–50 years, and none were above 50 years old.
- Regarding educational background, 8.0% held a diploma, 79.0% had a bachelor's degree (S1), and 13.0% held a master's or doctoral degree (S2/S3).

These results indicate that the majority of cloud gaming users in the study are young adults, predominantly male, and highly educated, which aligns with the common demographic profile of technology adopters and gamers.

Measurement Model Analysis

The Partial Least Squares (PLS) analysis in this study follows three key estimation categories:

1. Weight estimation to create latent variable scores.
2. Path estimation to evaluate the relationships between latent variables and their indicators (outer model).
3. Mean and location estimation to determine regression constant values for latent variables.

According to Ghozali & Latan (2015:73), the outer model is assessed to determine validity and reliability. The evaluation involves convergent validity, discriminant validity, and composite reliability through Cronbach's Alpha values.

Outer Model Analysis

The outer model analysis ensures that the measurements used are valid and reliable. The validity and reliability tests are conducted based on the following indicators:

- Convergent Validity
  Convergent validity is assessed based on the correlation between each measurement item (indicator) and its latent construct. A standardized loading factor above 0.7 indicates strong correlation and high validity. In this study, all outer loading values exceeded 0.7, confirming that the measurement items used have good convergent validity.
- Discriminant Validity
  Discriminant validity is evaluated based on the cross-loading of measurement items with constructs. If the correlation of an indicator with its construct is higher than with other constructs, it demonstrates strong discriminant validity. In this study, all tested variables had correlation values above 0.5, confirming good discriminant validity.

Inner Model Analysis

The inner model analysis examines the relationship between latent variables based on theoretical models. This analysis is conducted using bootstrapping procedures, which generate path coefficients, Cronbach's Alpha, HTMT, and R^2 values. The results of the inner model test are summarized in the following table:

Table 1: Inner Model Test Results

Hypothesis	Relationship	Path Coefficient	p-value	Result
H1	Consumer Confidence → Buying Interest	0.278	0.085	Valid, Insignificant
H2	Consumer Confidence → Risk Perception	0.202	0.069	Valid, Insignificant
H3	Perception of Convenience → Buying Interest	-0.024	0.871	Invalid
H4	Perception of Convenience → Risk Perception	0.737	0.000	Valid, Significant
H5	Risk Perception → Buying Interest	0.620	0.926	Valid, Significant

Source: Data processing using SmartPLS 3.3.2

Based on the hypothesis testing results:

- H1 was rejected, indicating no significant direct effect between consumer confidence and buying interest.
- H2 was rejected, showing no significant direct effect between consumer confidence and risk perception.

- H3 was rejected, demonstrating no significant direct effect between perceived convenience and buying interest.
- H4 was accepted, confirming a significant direct effect between perceived convenience and risk perception.
- H5 was accepted, indicating a significant direct effect between risk perception and buying interest.

These findings suggest that risk perception plays a key role in influencing consumer buying interest, while consumer confidence and perceived convenience do not directly impact purchase decisions.

The Partial Least Squares Structural Equation Modeling (PLS-SEM) analysis presented in Figure 1 illustrates the relationships between Perceived Ease of Use, Perceived Risk, Consumer Trust, and Purchase Intention in this study. This model evaluates both direct and indirect relationships between variables using SmartPLS 3.3.2.

From the data analysis results, it is evident that Perceived Ease of Use has a positive effect on Perceived Risk (0.737), indicating that the easier a technology is to use, the higher the level of risk perceived by consumers. However, Perceived Ease of Use does not have a significant effect on Purchase Intention (-0.024, $p > 0.05$), meaning that ease of use is not a primary factor driving purchase decisions in cloud gaming services.

Meanwhile, Perceived Risk has a significant positive effect on Purchase Intention (0.620, $p < 0.05$), suggesting that the higher the perceived risk, the greater the consumer's purchase intention in cloud gaming services. This indicates that in subscription-based technology industries, consumers tend to remain interested in making purchases despite recognizing certain risks.

Consumer Trust also has a positive relationship with Purchase Intention (0.278); however, its effect is weaker compared to Perceived Risk. This suggests that while trust in service providers is important, risk perception remains a key consideration in purchase decisions.

The model has an R^2 value of 0.712 for the Purchase Intention variable, meaning that the combination of Perceived Ease of Use, Perceived Risk, and Consumer Trust explains 71.2% of the variation in consumer purchase decisions, while the remaining percentage is influenced by other factors outside the model.

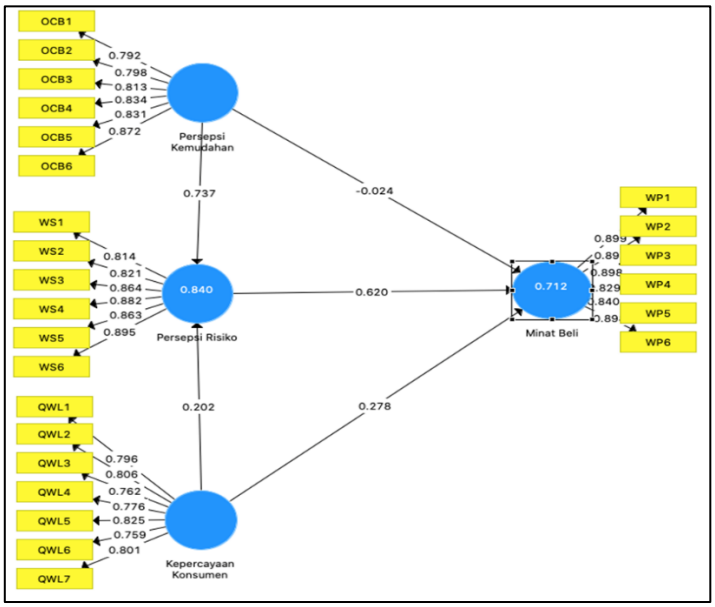

Figure 1. PLS-SEM Structural Model of Variable Relationships
Source: Data Processed with SmartPLS 3.3.2

The interpretation of these results suggests that in the context of cloud gaming, risk perception plays a more dominant role than ease of use in shaping consumer purchase intention. Therefore, cloud gaming service providers should focus on risk mitigation strategies, such as enhancing data security, ensuring service transparency, and guaranteeing stable performance, to improve the adoption rate of this technology in the Indonesian market.

Mediation Analysis: The Influence of Perceived Ease of Use on Buying Interest

To examine the mediating effect of risk perception, an additional mediation analysis was conducted. The results are presented in Table 2:

Table 2: Mediation Analysis Results

Hypothesis	Relationship	Path Coefficient	p-value	Result
H6	Perception of Convenience → Risk Perception → Buying Interest	0.457	0.001	Valid, Significant
H7	Consumer Confidence → Risk Perception → Buying Interest	0.125	0.116	Valid, Insignificant

Source: Data processing using SmartPLS 3.3.2

The findings indicate that:

- H6 was accepted, meaning risk perception significantly mediates the relationship between perceived convenience and buying interest.
- H7 was rejected, showing no significant mediating effect between consumer confidence and buying interest through risk perception.

These results suggest that perceived convenience indirectly affects buying interest through risk perception, emphasizing the importance of minimizing consumer concerns about risks in cloud gaming services. On the other hand, consumer confidence does not significantly contribute to risk perception or buying interest, implying that trust in cloud gaming providers alone is not enough to drive consumer adoption.

Summary of Key Findings

Risk perception significantly impacts buying interest, highlighting consumer concerns about security, reliability, and financial risks in cloud gaming.

Perceived convenience does not directly influence buying interest, but it affects risk perception, meaning that if consumers find cloud gaming difficult to use, they may perceive it as risky, lowering their buying interest.

Consumer confidence does not significantly impact either risk perception or buying interest, indicating that trust in the service provider alone is not a primary driver of adoption.

These findings provide valuable insights for cloud gaming providers, suggesting that reducing perceived risks and improving the user experience can encourage higher adoption rates and purchase decisions. Future research could explore additional factors such as pricing strategies, customer engagement, and technological advancements to further understand consumer behavior in cloud gaming adoption.

Discussion

The findings of this study provide valuable insights into the factors influencing purchase intention in cloud gaming services, particularly on the Skyegrid platform in Indonesia. Based on Partial Least Squares Structural Equation Modeling (PLS-SEM) analysis, it was found that perceived risk plays a dominant role in shaping consumer purchase intention, while perceived ease of use and consumer trust do not have a direct significant effect on purchase decisions. These results suggest that consumer behavior in cloud gaming adoption follows a different pattern than traditional technology adoption models, requiring further exploration of risk perception and its impact on decision-making.

One of the key findings is that perceived risk has a significant positive effect on purchase intention ($\beta = 0.620$, $p < 0.05$). This result is somewhat surprising, as perceived risk is generally viewed as a barrier to adoption (Kim et al., 2008). However, in the context of cloud gaming, perceived risk is likely related to connection stability, streaming quality, and service reliability rather than concerns over security or fraud. Users may still be willing to subscribe despite recognizing these risks, especially if the benefits outweigh their concerns. This aligns with previous research suggesting that in emerging technology-based service industries, consumers develop risk tolerance when they perceive high-value returns from the service (Gefen et al., 2003). In cloud gaming, users may accept risks related to latency issues or service interruptions as long as they gain flexibility, accessibility, and cost savings compared to traditional gaming models.

Another interesting result is that perceived ease of use does not have a significant direct effect on purchase intention ($\beta = -0.024$, $p > 0.05$). This contradicts the Technology Acceptance Model (TAM), which states that ease of use is an important driver of technology adoption (Davis, 1989). A possible explanation for this finding is that cloud gaming users are generally tech-savvy individuals who are already familiar with digital entertainment services. As a result, ease of use is not a major concern, and users prioritize other factors such as performance stability, pricing models, and game availability when making purchasing decisions. Similar findings have been observed in studies on subscription-based digital services, where usability becomes less important as users gain more experience with technology (Venkatesh et al., 2012). This suggests that cloud gaming service providers should shift their focus from emphasizing usability to highlighting service quality, reliability, and exclusive content offerings.

The role of consumer trust in purchase intention also presents an interesting perspective. Although consumer trust has a positive relationship with purchase intention ($\beta = 0.278$), the effect is weaker compared to perceived risk. This indicates that while trust is important, it is not the primary factor driving purchase decisions in cloud gaming. Unlike traditional e-commerce transactions where trust plays a crucial role in reducing perceived risks, cloud gaming adoption appears to be more influenced by service-related factors such as latency, game selection, and pricing models. Studies in the digital service industry have shown that trust alone is not sufficient to drive adoption, especially when users rely more on brand reputation, peer recommendations, and trial-based experiences before committing to a service (Pavlou & Dimoka, 2006). In cloud gaming, users may evaluate a provider's credibility based on service reviews, technical performance, and promotional offerings rather than direct trust in the provider itself.

These findings have several implications for cloud gaming service providers. First, since perceived risk strongly influences purchase intention, companies must focus on risk mitigation strategies to improve consumer confidence. This can be achieved by enhancing network infrastructure, reducing latency, and offering service guarantees to minimize potential

concerns. Second, marketing strategies should move beyond emphasizing ease of use and instead highlight the advantages of cloud gaming, such as cost efficiency, game accessibility, and cross-platform play. Third, given that consumer trust alone does not significantly impact purchase decisions, companies should invest in community-driven marketing efforts and partnerships with influencers or gaming content creators to strengthen credibility and user engagement.

Despite these valuable insights, this study has certain limitations. The research is limited to a single cloud gaming provider (Skyegrid), making it difficult to generalize the findings across different platforms such as GeForce Now, Google Stadia, or Xbox Cloud Gaming. Future research should explore cross-platform comparisons to identify whether these trends hold true across various cloud gaming services. Additionally, this study does not consider other factors such as pricing strategies, game exclusivity, and long-term user retention, which may also influence purchase intention. Future studies could integrate these variables to gain a more comprehensive understanding of consumer behavior in cloud gaming adoption. Another limitation is the sampling technique, which focuses primarily on active cloud gaming users. Future research could benefit from a longitudinal approach, tracking how consumer perceptions evolve over time as cloud gaming technology and market dynamics change.

Overall, the results suggest that risk perception plays a more significant role than ease of use and trust in driving purchase intention in cloud gaming services. This challenges traditional technology adoption models and highlights the need for a more nuanced approach to understanding consumer decision-making in cloud-based entertainment services. Cloud gaming companies must prioritize addressing perceived risks, improving service quality, and leveraging community engagement strategies to maximize adoption and market penetration. Future research should continue exploring the long-term impact of these factors and investigate how evolving technological advancements, such as 5G infrastructure and AI-driven gaming enhancements, influence consumer adoption patterns in cloud gaming.

Conclusion

This study provides important insights into consumer purchase intention in cloud gaming services, particularly in the Indonesian market. The results indicate that Perceived Risk plays a dominant role in shaping consumer purchase decisions, while Perceived Ease of Use does not have a significant direct effect. Additionally, Consumer Trust has a positive but weaker impact on purchase intention, suggesting that while trust in service providers is relevant, risk perception remains the key determinant in decision-making.

The findings highlight that consumers are still willing to purchase cloud gaming services despite recognizing potential risks. This suggests that, in the subscription-based technology industry, consumers may prioritize service reliability, pricing, and exclusive content over ease of use. The R^2 value of 0.712 further confirms that the combination of Perceived Ease of Use, Perceived Risk, and Consumer Trust explains 71.2% of the variations in purchase decisions, emphasizing the importance of these variables in cloud gaming adoption.

From a managerial perspective, cloud gaming service providers should focus on risk mitigation strategies to enhance consumer confidence. This includes improving network stability, ensuring data security, and increasing service transparency. Moreover, marketing strategies should shift from emphasizing ease of use to promoting the unique advantages of cloud gaming, such as cost efficiency, accessibility, and cross-platform compatibility.

Despite its contributions, this study has several limitations. The research focuses on a single cloud gaming provider (Skyegrid), making it difficult to generalize findings across other

platforms such as GeForce Now, Google Stadia, or Xbox Cloud Gaming. Future research should explore cross-platform comparisons and consider additional variables such as pricing models, content variety, and long-term user engagement. Additionally, conducting a longitudinal study could provide deeper insights into how consumer perceptions evolve over time as cloud gaming technology advances.

Overall, the study confirms that risk perception plays a more significant role than ease of use and trust in shaping purchase intention in cloud gaming services. These findings challenge traditional technology adoption models and suggest that companies must prioritize addressing perceived risks, improving service quality, and leveraging community engagement strategies to increase market adoption. Future research should continue exploring long-term industry trends, consumer behavior shifts, and the impact of emerging technologies such as 5G on cloud gaming adoption.

Declarations

Author contribution statement

The lead author participated in the study's conceptualization and design, analysis, interpretation of data, and initial drafting of the paper. Each author contributed to the critical revision of the content for intellectual rigor and provided final approval for the published version. All authors are responsible for every aspect of the work.

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Data availability statement

The data supporting this study's findings are available from the corresponding author upon reasonable request. However, due to privacy and ethical considerations, the data are not publicly accessible.

Declaration of Interests Statement

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