



**Ranah Research**  
Journal of Multidisciplinary Research and Development

E-ISSN: 2655-0865

DINASTI RESEARCH

082170743613 ranahresearch@gmail.com <https://jurnal.ranahresearch.com>

DOI: <https://doi.org/10.38035/rrj.v8i3>  
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## A Socio-Technical Model of Knowledge Sharing and Discovery in Social Fitness Apps among Indonesian Users: A PLS-SEM Approach

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**Abstract:** Social fitness applications such as Strava, Nike Run Club, and Garmin Connect have turned exercise tracking into a community-based activity where users exchange tips, experiences, and performance data. However, little is known about what drives users to share and discover knowledge on these platforms. This study proposes and tests a socio-technical model that explains knowledge sharing and discovery behaviour in social fitness apps. The model integrates Social Capital Theory, the Technology Acceptance Model, and the Theory of Planned Behavior. Data was collected from 57 active users of social fitness applications and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results show that perceived usefulness, structural social capital, and perceived behavioural control significantly influence users' intentions, while attitude and cognitive social capital do not play a major role. Intention, in turn, strongly predicts actual knowledge sharing and discovery behaviour. These findings suggest that knowledge-related actions in social fitness communities are driven mainly by functional benefits, connectedness within the community, and users' sense of capability, rather than by evaluative attitudes alone. The study offers a clearer view of how socio-technical factors work together in digital fitness ecosystems and provides a basis for future research on knowledge behaviour in online communities.

**Keyword:** *Social fitness applications, Knowledge sharing, Knowledge discovery, Socio-technical behavioural model, Sem-pls.*

### INTRODUCTION

The rise of social fitness applications such as Strava, Nike Run Club, Garmin Connect, and similar platforms has transformed digital exercise communities into spaces where users not only track physical activities but also exchange insights, experiences, and

performance-related knowledge (Pinem et al., 2024). Through features like activity feeds, virtual clubs, challenges, and peer interaction, these platforms enable individuals to learn from each other and enhance their training through a combination of social engagement and technological support (Selim et al., 2022). Knowledge sharing and discovery have become central behaviours within social fitness ecosystems. Users frequently share tacit knowledge (e.g., training tips, route insights) alongside explicit information such as performance metrics and workout patterns (Selim et al., 2022; Xin et al., 2023; Deng et al., 2022). Despite the increasing importance of these knowledge-related interactions, limited research has examined the socio-technical factors that drive such behaviours in social fitness contexts, highlighting the need for deeper investigation into the mechanisms that encourage users to share and discover knowledge through these platforms (Ruiz-Herrera et al., 2023).

Although social fitness applications have become increasingly popular as digital communities for tracking activities and exchanging insights, existing research has not fully explored how knowledge-related behaviours emerge within these platforms. Most prior studies focus on aspects such as motivation, gamification, usability, or physical activity outcomes, while the behavioural mechanisms that underlie knowledge sharing and discovery remain underexamined. As a result, the theoretical understanding of how users exchange information, learn from community interactions, and utilize shared content for performance improvement in social fitness contexts is still limited.

Furthermore, the factors that influence these behaviours are inherently socio-technical, involving both social elements such as trust, norms, and network structure and technological perceptions such as usefulness and ease of use (Pérez Fernández et al., 2024; Selim et al., 2022; Di Gangi et al., 2023). Despite this complexity, there is a lack of integrated models that combine social capital theory, technology acceptance frameworks, and behavioural intention perspectives to explain knowledge sharing and discovery in social fitness ecosystems. This gap underscores the need for a more comprehensive examination of the socio-technical factors that shape users' knowledge-related participation in these platforms. Addressing this gap, the present study proposes and empirically tests an integrated socio-technical behavioural model using PLS-SEM to explain the factors influencing users' knowledge sharing and discovery intentions.

Based on the gaps identified in prior studies and the need for a more integrated socio-technical understanding of knowledge-related behaviors in social fitness environments, this study formulates a research question that guides the overall investigation:

1. What socio-technical factors influence knowledge sharing and discovery intentions in social fitness apps among Indonesian users?
2. How are these factors related to the PLS-SEM model?

These questions reflect the study's aim to examine the interplay between social capital, technology perceptions, and behavioral determinants in shaping users' intentions within a predictive structural framework.

## **METHOD**

This study adopted a quantitative research strategy, implementing the PLS-SEM approach to analyse users' responses regarding the socio-technical factors that influence knowledge sharing and discovery intention on social fitness applications. The use of PLS-SEM is appropriate for predictive behavioural modelling and has been widely applied across various domains, including digital communities, online knowledge platforms, and technology adoption research. Following the five logical stages of PLS-SEM which are specification, identification, parameter estimation, model estimation, and model modification that examined the structural relationships between latent constructs derived from Social Capital Theory (SCT), Technology Acceptance Model (TAM), and the Theory of Planned Behavior (TPB).

The analytical procedure followed the criteria including assessment of the reflective measurement model through reliability, convergent validity, and discriminant validity, followed by evaluation of the structural model using coefficient paths,  $R^2$ ,  $Q^2$ , and effect size ( $f^2$ ) to determine predictive relevance. The model accommodated both reflective constructs and complex theoretical linkages typically found in socio-technical behavioural research. Subsequently, the study followed the main analytical steps typically employed in PLS-SEM studies to develop and validate the integrated socio-technical behavioural model proposed for social fitness applications.

### Hypothesis Development

Building on the theoretical foundations discussed in the previous section, this study develops a set of hypotheses that reflect the socio-technical mechanisms influencing knowledge sharing and discovery behaviour in social fitness applications. Prior research across digital communities, health forums, and online travel platforms has demonstrated that knowledge-related behaviours are shaped by the interplay between social capital, technological perceptions, and behavioural determinants.

These insights support the integration of Social Capital Theory (SCT), the Technology Acceptance Model (TAM), and the Theory of Planned Behavior (TPB) into one unified framework. Accordingly, the following hypotheses were formulated to examine the structural relationships between cognitive and structural social factors, technology acceptance variables, and behavioural intention pathways within the proposed socio-technical model.

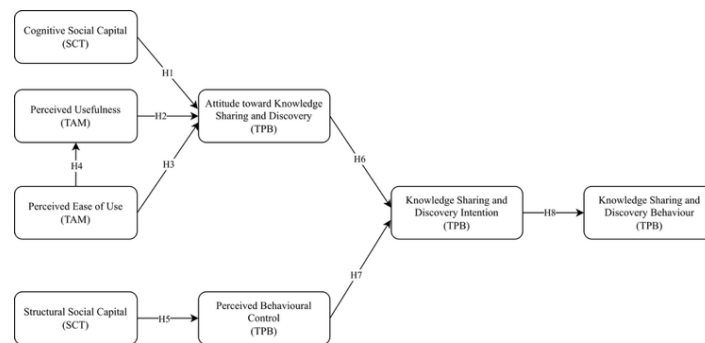


Figure 1. Proposed Model

1. Cognitive Social Capital → Attitude Toward Knowledge Sharing and Discovery  
Cognitive social capital reflects shared norms, trust, and mutual understanding among community members, which form the basis for collaboration and social learning (Nahapiet & Ghoshal, 1998). In the context of social fitness platforms, values of trust and collective identity strengthen positive perceptions of knowledge sharing and information exploration. Previous studies have shown that shared norms and trust strengthen positive attitudes toward engagement in online communities (Pérez Fernández et al., 2024; Selim et al., 2022). Therefore, the higher the level of cognitive social capital within a community, the more positive users' attitudes toward knowledge sharing and discovery on the platform. Therefore, the proposed hypothesis is as follows:  
**H1: Cognitive Social Capital has a positive effect on Attitude Toward Knowledge Sharing and Discovery.**
2. Perceived Usefulness → Attitude toward Knowledge Sharing and Discovery  
Based on the Technology Acceptance Model, perceived usefulness of a system is a primary determinant of user attitudes toward technology (Davis, 1989). If users perceive that a social fitness platform provides tangible benefits, such as improved exercise performance or broader access to knowledge, they will have a more positive attitude

toward knowledge sharing activities. Perceived usefulness significantly influences attitudes toward technology use behaviour (Ruiz-Herrera et al., 2023; Wei et al., 2025). Therefore, the proposed hypothesis is as follows:

**H3: Perceived Usefulness has a positive effect on Attitude toward Knowledge Sharing and Discovery.**

3. Perceived Ease of Use → Attitude toward Knowledge Sharing and Discovery

Perceived ease of use describes the extent to which users believe that using a system will be free from difficulty (Davis, 1989). When users perceive knowledge sharing and discovery features as easy to use, this creates a sense of comfort and increases positive attitudes toward the platform. Empirical evidence shows that ease of use directly influences positive attitudes toward digital technology (Ruiz-Herrera et al., 2023; Wei et al., 2025). Therefore, the proposed hypothesis is as follows.

**H4: Perceived Ease of Use has a positive effect on Attitude toward Knowledge Sharing and Discovery.**

4. Perceived Ease of Use → Perceived Usefulness

In addition to influencing attitude, perceived ease of use is also a major determinant of perceived usefulness in the TAM model (Davis, 1989). When users perceive a platform as easy to use, they are more likely to perceive the system as beneficial for their fitness and knowledge activities. This relationship has been consistently demonstrated in the literature that a significant influence between ease of use and perceived usefulness of the system on digital technology adoption (Ruiz-Herrera et al., 2023). Therefore, the proposed hypothesis is as follows:

**H5: Perceived Ease of Use has a positive effect on Perceived Usefulness.**

5. Structural Social Capital → Perceived Behavioral Control

Structural social capital describes the extent to which an individual has a broad social network and connections with other community members (Nahapiet & Ghoshal, 1998). Strong social connectedness increases perceived control and ease of access to knowledge resources, thereby strengthening feelings of ability to actively contribute. Social relationships in digital networks can increase perceived control and accessibility to information (Di Gangi et al., 2023). Therefore, the stronger an individual's social network on a social fitness platform, the higher their perceived ability to share and discover knowledge. Therefore, the proposed hypothesis is as follows:

**H5: Structural Social Capital has a positive effect on Perceived Behavioural Control.**

6. Attitude Toward Knowledge Sharing and Discovery → Knowledge Sharing and Discovery Intention

In the Theory of Planned Behaviour, attitude toward a behaviour is a major predictor of intention to act (Ajzen, 1991). A positive attitude toward knowledge sharing and discovery activities will increase an individual's desire to engage in them. Attitudes toward knowledge sharing have a direct influence on users' intention to continue doing so in online communities (Selim et al., 2022; Ajzen, 1991). Therefore, the proposed hypothesis is as follows:

**H6: Attitude toward Knowledge Sharing and Discovery has a positive effect on Knowledge Sharing and Discovery Intention.**

7. Perceived Behavioural Control → Knowledge Sharing and Discovery Intention

Perceived behavioural control describes the extent to which an individual feels capable of controlling a particular behaviour. In the context of knowledge sharing on a social fitness platform, individuals with high levels of self-efficacy, for example, who feel capable of using the features, understand community norms, and have sufficient time, will have a stronger intention to participate (Selim et al., 2022; Ajzen, 1991). Therefore, the proposed hypothesis is as follows:

**H7: Perceived Behavioural Control has a positive effect on Knowledge Sharing and Discovery Intention.**

8. Knowledge Sharing and Discovery Intention → Knowledge Sharing and Discovery Behaviour

Intention to perform an action is the strongest predictor of actual behaviour (Ajzen, 1991). In the context of social fitness platforms, users with a strong intention to share and discover knowledge are more likely to actually do so through interactions, posts, and comments in the community. Knowledge sharing intention significantly influences actual behaviour in online communities (Selim et al., 2022). Therefore, the proposed hypothesis is as follows:

**H8: Knowledge Sharing and Discovery Intention has a positive effect on Knowledge Sharing and Discovery Behaviour.**

**Research Instrument**

This study employed a structured questionnaire as the primary research instrument. All measurement items were adapted from the proposed research model, which integrates constructs from the socio-technical perspective of knowledge sharing and discovery in social fitness applications. Each item was measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), to capture respondents' level of agreement with each statement.

**Data Collection**

This study used a quantitative approach with an online survey method to collect data through a structured questionnaire. The questionnaire was designed to evaluate factors that influence knowledge sharing and discovery behavior among social fitness app users. The target respondents in this study were active users of social fitness apps who had engaged in at least one form of digital community interaction, such as sharing activities, providing comments, participating in discussions, or sharing information and experiences. The sampling technique used was purposive sampling, considering relevant respondent characteristics and their experience in using community features on social fitness apps. Of the total responses collected, 57 data were declared valid and suitable for analysis after going through a data cleaning process.

**Data Analysis**

The collected data were analyzed using the Structural Equation Modeling Partial Least Squares (SEM-PLS) technique with SmartPLS software version 4.

**RESULTS AND DISCUSSION**

**Demographic analysis of respondents**

The study collected responses from 57 participants with a diverse demographic profile. Most respondents were between 27–36 years old, followed by those aged 17–26 and 37–46. Gender distribution was balanced, with 28 females and 29 males. In terms of platform usage, Strava was the most widely used social fitness application, followed by Nike Run Club, Garmin Connect, Komoot/Relive, and Adidas Running. Regarding community engagement duration, the majority had participated in social fitness communities for 6–12 months or 1–2 years, indicating that most respondents were moderately experienced users.

**Table 1. Respondents' Demographic**

Characteristics	Item	Frequency
Age (years)	17 - 26	18
	27 - 36	22
	37 - 46	15
	> 46	2

Characteristics	Item	Frequency
Gender	Female	28
	Male	29
Social Fitness Application	Strava	25
	Nike Run Club	13
	Adidas Running	5
	Garmin Connect	8
	Komoot / Relive	6
	Others	0
Joined Community Since	< 6 Months	8
	6–12 Months	24
	1–2 Years	20
	> 2 Years	5

**Measurement Model**

Initially, each construct in the model consisted of four indicators. During the measurement model assessment, indicators with outer loading values below 0.50 were removed to improve reliability and overall model fit (Hair et al., 2019). After this refinement, the second iteration results presented in Table II show that all remaining indicators have loading values ranging from 0.724 to 0.939. Therefore, all retained indicators are valid and suitable for further analysis in the reliability and validity assessment stage.

**Table 2. The Value of 2<sup>nd</sup> Iteration Loading Factor**

Variable	Indicator	Loading Factor	Validity
Cognitive Social Capital	CSC2	0.897	Valid
	CSC4	0.732	Valid
Perceived Usefulness	PU2	0.857	Valid
	PU3	0.724	Valid
Perceived Ease of Use	PEUO1	0.890	Valid
	PEUO3	0.731	Valid
	PEUO4	0.727	Valid
Structural Social Capital	SSC2	0.930	Valid
	SSC4	0.739	Valid
Attitude toward Knowledge Sharing and Discovery	ATT1	0.882	Valid
	ATT3	0.939	Valid
Perceived Behavioural Control	PBC2	0.920	Valid
	PBC4	0.825	Valid
Knowledge Sharing and Discovery Intention	INT1	0.938	Valid
	INT4	0.905	Valid
Knowledge Sharing and Discovery Behaviour	BEH2	0.851	Valid
	BEH4	0.832	Valid

Figure 1 visually presents the measurement model after the second iteration. It shows the retained indicators and their respective loading values, illustrating the relationships between latent constructs.

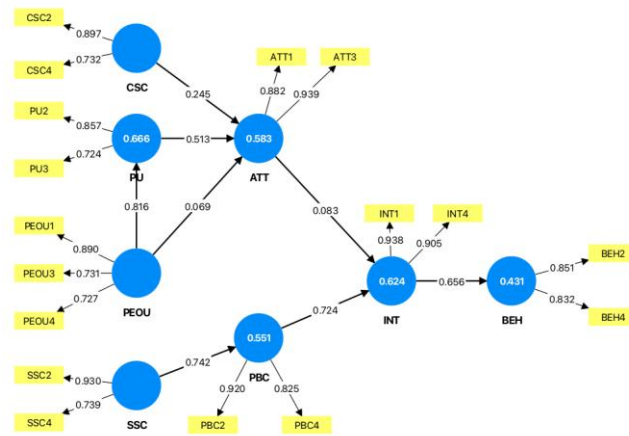


Figure 2. Outer Loading Results

Table 3 presents the results of the reliability and convergent validity analysis for each construct, measured using Cronbach’s Alpha (CA), Composite Reliability (CR), and Average Variance Extracted (AVE). The values of CA range from 0.421 to 0.824. For some constructs, such as Perceived Usefulness (0.421) and Cognitive Social Capital (0.524), the value falls slightly below the conventional threshold of 0.70.

All CR values exceed 0.70, indicating satisfactory construct reliability and internal consistency. The highest CR values are found in Knowledge Sharing and Discovery Intention (0.918) and Attitude toward Knowledge Sharing and Discovery (0.907), demonstrating strong reliability among their indicators. Similarly, the AVE values for all constructs are above 0.50, confirming adequate convergent validity. This means that more than 50% of the variance in the indicators is explained by their latent constructs (Kline, 2016).

Table 3. The Value of Cronbach’s Alpha (CA) and Composite Reliability (CR)

Variable	CA	CR	AVE
Cognitive Social Capital	0.524	0.829	0.670
Perceived Usefulness	0.421	0.772	0.630
Perceived Ease of Use	0.685	0.828	0.619
Structural Social Capital	0.610	0.825	0.705
Attitude toward Knowledge Sharing and Discovery	0.800	0.907	0.830
Perceived Behavioural Control	0.700	0.866	0.764
Knowledge Sharing and Discovery Intention	0.824	0.918	0.849
Knowledge Sharing and Discovery Behaviour	0.587	0.829	0.708

Table 4 presents the results of the discriminant validity assessment using the Fornell–Larcker criterion. Discriminant validity ensures that each construct in the model is distinct from the others, meaning that the indicators of one construct do not overlap with those of another. According to the Fornell–Larcker rule, the square root of each construct’s AVE should be greater than its correlations with other constructs in the same column and row (Hair et al., 2019). Hence, most constructs demonstrated acceptable discriminant validity. However, correlations among Perceived Ease of Use, Perceived Usefulness, and Intention were high, slightly exceeding their square roots of AVE. This suggests a certain degree of conceptual overlap among the technology-related constructs.

Table 4. The Fornell–Larcker Result

	ATT	BEH	CSC	INT	PBC	PEOU	PU	SSC
ATT	<b>0.911</b>							
BEH	0.481	<b>0.841</b>						
CSC	0.649	0.433	<b>0.818</b>					
INT	0.643	0.65	0.687	<b>0.921</b>				

<b>PBC</b>	0.774	0.518	0.813	0.788	<b>0.874</b>		
<b>PEOU</b>	0.661	0.521	0.710	0.900	0.857	<b>0.787</b>	
<b>PU</b>	0.839	0.541	0.693	0.767	0.781	0.816	<b>0.784</b>
<b>SSC</b>	0.774	0.739	0.731	0.739	0.742	0.699	0.745 <b>0.840</b>

**Structural Model**

Table 5 presents the R-square ( $R^2$ ) values obtained from the previous stage. The results show that Perceived Usefulness ( $R^2 = 0.666$ ) and Knowledge Sharing and Discovery Intention ( $R^2 = 0.624$ ) demonstrate strong explanatory power, indicating that their predictors effectively explain the variance within these constructs. Meanwhile, Attitude toward Knowledge Sharing and Discovery ( $R^2 = 0.583$ ), Perceived Behavioral Control ( $R^2 = 0.551$ ), and Knowledge Sharing and Discovery Behaviour ( $R^2 = 0.431$ ) exhibit moderate levels of explanatory power.

These results suggest that the socio-technical model proposed in this study has a good predictive capability. In particular, the high  $R^2$  value for Intention implies that behavioural intention is strongly influenced by the combined effects of perceived usefulness, attitude, and perceived control, which consistent with the TAM and TPB.

**Table 5. The Value of 2<sup>nd</sup> Iteration Loading Factor**

Variable	R-square	Conclusion
Perceived Usefulness	0.666	Strong
Attitude toward Knowledge Sharing and Discovery	0.583	Moderate
Perceived Behavioural Control	0.551	Moderate
Knowledge Sharing and Discovery Intention	0.624	Strong
Knowledge Sharing and Discovery Behaviour	0.431	Moderate

**Table 6. Hypothesis Test Result**

Hypothesis	Path	T-Statistic	P-Values	Conclusion
H1	CSC → ATT	1.855	0.064	Rejected
H2	PU → ATT	3.058	0.002	Accepted
H3	PEOU → ATT	0.465	0.642	Rejected
H4	PEOU → PU	16.681	0.000	Accepted
H5	SSC → PBC	13.954	0.000	Accepted
H6	ATT → INT	0.791	0.429	Rejected
H7	PBC → INT	8.772	0.000	Accepted
H8	INT → BEH	9.071	0.000	Accepted

Table 6 presents the results of the structural model evaluation, summarizing the significance of each hypothesized relationship between constructs in the proposed socio-technical behavioural model. Based on the t-statistics and p-values reported in the table, five hypotheses are supported, while three hypotheses are rejected.

First, H1 (Cognitive Social Capital → Attitude) is rejected ( $t = 1.855$ ,  $p = 0.064$ ), indicating that shared understanding, trust, and common values within a social fitness community do not significantly shape users’ attitude toward knowledge sharing and discovery. Similarly, H3 (Perceived Ease of Use → Attitude) is also rejected ( $t = 0.465$ ,  $p = 0.642$ ), suggesting that the perceived simplicity of platform features does not directly generate a positive attitude toward knowledge-related behaviours. In addition, H6 (Attitude → Intention) is rejected ( $t = 0.791$ ,  $p = 0.429$ ), implying that even when users hold positive attitudes, this does not necessarily translate into stronger intentions to engage in knowledge sharing and discovery.

Conversely, several hypotheses are strongly supported. H2 (Perceived Usefulness → Attitude) is accepted ( $t = 3.058$ ,  $p = 0.002$ ), demonstrating that users’ perception of the benefits and usefulness of the platform plays a critical role in shaping their attitude toward

knowledge-related activities. H4 (Perceived Ease of Use → Perceived Usefulness) exhibits a very strong and significant effect ( $t = 16.681$ ,  $p = 0.000$ ), reinforcing the classic TAM logic that ease of use enhances perceived usefulness. Likewise, H5 (Structural Social Capital → Perceived Behavioural Control) is significant ( $t = 13.954$ ,  $p = 0.000$ ), indicating that network ties, frequency of interactions, and social connectedness increase users' perceived capability to share and discover knowledge.

Finally, two behavioural pathways strongly align with TPB. H7 (Perceived Behavioural Control → Intention) is accepted ( $t = 8.772$ ,  $p = 0.000$ ), showing that users' confidence in their ability to perform knowledge-related behaviours is a key determinant of their intention to engage in those behaviours. H8 (Intention → Behaviour) also shows a strong significant relationship ( $t = 9.071$ ,  $p = 0.000$ ), confirming that behavioural intention is the primary driver of actual knowledge sharing and discovery actions within social fitness communities.

Overall, the results highlight the dominant influence of technological usefulness, structural social connections, and behavioural control in predicting knowledge sharing and discovery, while attitude surprisingly does not play a significant mediating role in this context.

## Discussion of Results

The findings of this study offer a clearer picture of the socio-technical conditions that shape users' intentions to share and discover knowledge in social fitness applications. On the technological side, perceived usefulness stands out as a key driver of users' attitudes. When users feel that the platform genuinely helps them improve their workouts or provides valuable information, they tend to view knowledge-related activities more positively. This result is very much in line with TAM-based that a strong effect of perceived usefulness on user attitude and intention (Ruiz-Herrera et al., 2023; Wei et al., 2025). Perceived ease of use plays an important but indirect role: the easier the platform is to operate, the more users see it as useful. Again, this pattern is broadly consistent with prior TAM research, although our finding that ease of use does not directly shape attitude deviates from many earlier studies where both usefulness and ease of use significantly influence attitude.

From the social perspective, the results highlight the importance of structural social capital. Users who have stronger connections within the community such as more frequent interactions, membership in groups, or broader social ties to feel more capable of taking part in knowledge sharing and discovery. This echoes evidence from online travel and entrepreneurial communities (Pérez Fernández et al., 2024; Selim et al., 2022), where dense network ties and active participation are associated with higher perceived control and willingness to share knowledge. However, cognitive social capital does not significantly influence user attitudes in our model. This contrasts with several studies in virtual communities and health forums that emphasize trust, shared norms, and a sense of common identity as key drivers of positive attitudes toward knowledge sharing. In the context of social fitness apps, it appears that being connected matters more than feeling alike.

In the behavioural pathway, perceived behavioural control emerges as the strongest predictor of intention, while attitude does not significantly affect intention. This is a notable departure from many TPB-based studies, including work on online travel communities and sports media consumption where attitude typically shows a substantial positive effect on intention. One plausible explanation is that social fitness platforms are fast-paced and performance-oriented: users may rely more on their sense of ability and opportunity (for example, knowing how to use features, having time to post, feeling embedded in a group) than on reflective evaluations of whether sharing knowledge is "good" or "bad." At the same time, our finding that intention strongly predicts actual knowledge sharing and discovery

behaviour is fully consistent with the core logic of TPB and with prior work on continuance behaviour in online communities.

These results provide a direct answer to the research question. In this sample, knowledge sharing and discovery intentions in social fitness apps are driven primarily by perceived usefulness, structural social capital, and perceived behavioural control, with intention acting as the main bridge to actual behaviour. Attitude and cognitive social capital play a much smaller role than the classic models would suggest, indicating that in social fitness ecosystems knowledge-related behaviour is shaped more by functional benefits, concrete social connections, and a sense of capability than by evaluative judgements or shared beliefs.

## CONCLUSION

This study sets out to examine the socio-technical factors that shape knowledge sharing and discovery within social fitness applications. By integrating Social Capital Theory, the Technology Acceptance Model, and the Theory of Planned Behavior into a single framework, the study provides new insight into how technological perceptions, social structures, and behavioural beliefs jointly influence user participation. The results show that perceived usefulness, structural social capital, and perceived behavioural control play central roles in driving users' intentions and behaviours, while attitude and cognitive social capital have limited influence. These findings highlight that knowledge-related actions in social fitness environments are driven more by practical benefits and users' sense of capability than by evaluative judgments. Overall, the study contributes to a clearer understanding of the mechanisms that encourage knowledge exchange in digital fitness communities and offers a foundation for future research on socio-technical behaviour in emerging online platforms.

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