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Digital Engagement and User Satisfaction in Public Libraries: Development of the Kerala Model of Social Media Engagement

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***Abstract*—The rapid digitization of public library services has significantly transformed user interaction and service delivery. This study investigates the principal factors influencing digital engagement and user satisfaction in public libraries, specifically within the context of Kerala. Using a quantitative research design, data were gathered from 687 respondents, including library users and professionals from 300 public libraries. The study utilizes regression analysis and Structural Equation Modeling (SEM) to examine the interrelationships among awareness, platform preference, perceived usefulness, digital literacy, engagement behavior, and user satisfaction. The results show that perceived usefulness and digital literacy have a big effect on engagement behavior, which in turn is a strong predictor of user satisfaction. The study develops a multilevel framework demonstrating how organizational readiness and digital inclusion jointly shape engagement outcomes. The model provides both theoretical and practical insights for enhancing digital strategies in public libraries.**

***Index Terms*—Public Libraries, Social Media Engagement, Digital Literacy, SEM, User Satisfaction, Kerala Model**

I. INTRODUCTION

Public libraries are changing into digital knowledge hubs, offering their services beyond their physical locations through social media and other online platforms. This change has opened up new ways for people to interact, get involved, and be part of the community. But how well digital initiatives work depends on how people see, access, and use these services.

In Kerala, public libraries have increasingly adopted digital platforms, yet the level of meaningful engagement remains uneven. Many libraries have a digital presence, but users can't always interact

with them. This brings up important questions about what makes people happy and engaged in digital library settings.

The aim of this study is to analyze the determinants affecting engagement behavior and user satisfaction and to develop a comprehensive model that clarifies digital engagement in public libraries. This study combines the Technology Acceptance Model with digital inclusion theory to clarify digital participation in public libraries. This framework takes a multilevel approach that looks at institutional readiness, user capability, and interaction behavior.

II. OBJECTIVES OF THE STUDY

1. To examine the extent of social media adoption and usage among public libraries in Kerala.
2. To examine the impact of perceived usefulness on social media engagement behaviors among library professionals and users.
3. To investigate the impact of engagement behavior on social media usage in public libraries.
4. To examine how social media usage and engagement behavior influence information activities in public libraries.
5. To identify the challenges and barriers affecting effective utilization of social media as a community information tool.
6. To provide recommendations for improving social media strategies in public libraries for enhanced user engagement and service delivery.

III. LITERATURE REVIEW

Research on social media in public libraries has evolved from examining basic online communication practices to exploring user-centered digital engagement. Earlier studies highlighted the role of social media as an extension of library information activities, enabling communication, content creation, information sharing, and community participation. More recent investigations have demonstrated that the effectiveness of social media depends not only on platform adoption but also on how strategically libraries design and deliver content. Evidence suggests that interactive and user-oriented posts generate stronger engagement than purely informational messages, emphasizing the need for libraries to move beyond one-way communication toward participatory digital environments.

The incorporation of social media into public library services has garnered heightened academic interest, especially within the overarching context of user-centered digital transformation and Library 2.0. Mia Kronqvist-Berg's early conceptual work (2014) focuses on how public libraries, social media, and users are changing over time, with information activities playing a key role in this change. Her research delineates fundamental activities including reading, seeking, creating, communicating, informing, mediating, and contributing, thereby establishing a foundational framework for comprehending the interactions between users and library professionals in social media contexts.

Later studies have looked at how libraries can use social media strategically for marketing and communication. Nohyun Choi and Sanghee Joo (2021) investigate the obstacles, incentives, and perceptions affecting the adoption of social media in public libraries. Their research shows that libraries understand how important social media is for outreach and visibility, but they often have trouble using it effectively because of institutional barriers, a lack of expertise, and limited resources. Likewise, Sanghee Joo, Nohyun Choi, and Taehyun Baek (2018) examine the correlation between Facebook content types and user engagement, illustrating that interactive and user-centric content markedly increases engagement levels relative to solely informational posts.

Research has also focused on finding the best ways to use social media. Kieran Smeaton and Katherine Davis (2014) say that for public libraries to have successful social media strategies, they need to make content regularly, respond to users, and meet their needs. Walt Crawford (2014) backs this up by saying that how often and how consistently people post are two of the most important things that affect user engagement. He also points out that posting irregularly makes it harder for people to see and interact with posts in fast-paced social media settings.

Nohyun Choi and Laura M. Harper (2020) offer a comprehensive synthesis of current scholarship, examining the utilization of the social web in public libraries. Their research shows that platforms like Facebook, Instagram, YouTube, and Pinterest are becoming more diverse, and it shows that libraries need to use multi-platform strategies to reach a wide range of users. Elaine Forcier, Dinesh Rathi, and Lisa M. Given (2013) examine the function of social media in knowledge management, illustrating how these platforms promote information dissemination and organizational learning in public libraries.

Empirical studies have also examined user engagement dynamics through social media analytics. Hongyu Zou, Hsinchun Chen, and Sourav Dey (2015) analyze Twitter-based engagement in public libraries, revealing that strategic content and active interaction significantly influence user participation. Furthermore, Niamh Canty (2012) highlights the complex and evolving nature of social media use in libraries, emphasizing issues of trust, professional identity, and user expectations in digital environments.

Iris Xie and Jennifer Stevenson (2014) also looked into how social media can be used in digital libraries. They show how social media tools can make it easier for users to interact, share content, and access digital resources. Their findings support the idea that social media is an extension of traditional library services into digital spaces where people can interact and take part.

Social media is now a powerful force that affects how people talk to each other, share information, and act in many different areas. Recent interdisciplinary research underscores the transformative potential and intricate implications of social media utilization. Dane and Bhatia (2023) illustrate that social media profoundly affects users' perceptions and behaviors, especially among adolescents, where heightened exposure correlates with psychological and behavioral consequences, including body image issues and maladaptive information consumption habits. Dam et al. (2023) also find strong links between using social media, fear of missing out (FoMO), and mental health outcomes. They focus on the emotional and behavioral sides of digital engagement.

Özkent (2022) finds a positive link between social media use and the visibility and citation impact of academic research. This means that social media can be a powerful way to spread information and get people interested in it. In a similar context, Rahaman et al. (2022) utilize the Technology Acceptance Model (TAM) and Information Adoption Model (IAM) to illustrate the substantial impact of electronic word-of-mouth (eWOM) on social media on user decision-making behavior. Yang et al. (2022) back up these results by showing that long-term user retention is helped by sustained engagement on social media sites. This shows how important strategic content and interaction are for keeping user relationships.

Researchers have also looked at how social media affects how people interact with each other and learn in schools and colleges. Lim et al. (2022) demonstrate that heightened social media usage, especially during the COVID-19 pandemic, substantially transformed students' communication patterns and information-seeking behaviors, while also affecting their mental well-being. Kutu and Olajide (2022) examine the function of social media within academic communities, highlighting that it improves accessibility and information dissemination, yet issues like digital literacy deficiencies and infrastructural constraints remain.

Comparative analyses show how the media ecosystem has changed from traditional to social media platforms. According to Al-Quran (2022), social media has changed the way people communicate by making it possible for people to interact in real time and with each other, but it also makes it hard to trust information and deal with too much content. Salas-Zárate et al. (2022) show how social media data can be used for advanced analytics, like finding behavioral patterns and mental health indicators. This shows that the platform serves two purposes: as a source of information and as a data ecosystem.

These larger social media trends have big effects on public libraries. Johnston et al. (2022) stress that library workers are becoming more aware of how important digital skills, like using social media, are to their jobs in the public sphere. Adding social media to library services shows a move toward more interactive, user-centered ways of communicating, which is in line with the ideas behind Library 2.0. Yet, as previous library-focused studies have shown, there is often a gap between what social media can do and how well it is used in real life.

The literature review clearly demonstrates that social media exerts a complex influence on information practices, user engagement, and institutional strategies. In the context of public libraries, social media presents substantial opportunities for augmenting communication, enhancing service delivery, and promoting community engagement. But there are still a number of problems, such as not having enough resources, not having enough digital skills, and not having consistent strategies for putting things into action.

Social media can greatly improve communication, engagement, and service delivery in public libraries. However, for it to work well, libraries need to support it, have a clear content strategy, be good with technology, and design it with the user in mind. Studies consistently indicate a disparity between this potential and actual implementation. This gap is especially clear in Kerala, where many people use social media but don't do much with it, so there isn't much interaction or engagement. Interdisciplinary research indicates that social media affects user behavior,

perceptions, and institutional practices. This study examines social media engagement, platform usage, and implementation challenges in public libraries through the integration of diverse viewpoints.

IV. METHODOLOGY

The study employed a quantitative research methodology to analyze social media usage and engagement in public libraries, utilizing a structured questionnaire for systematic data collection. The study included 687 participants, consisting of library patrons and librarians from 300 public libraries. This gave a full picture of how people use social media. The study concentrated on six principal constructs: Awareness (AW), Platform Preference (PP), Engagement Behavior (EB), Perceived Usefulness (PU), Digital Literacy (DL), and User Satisfaction (US), all evaluated through multi-item Likert scales to guarantee reliability and consistency. We used SPSS to look at the data we gathered for basic statistics, reliability testing, and early testing. We used AMOS to do Structural Equation Modeling (SEM) to see how the variables are related and to test the proposed research model.

V. DATA ANALYSIS AND RESULTS

Extent of social media adoption and usage among public libraries in Kerala.

Table 1 Extent of social media adoption and usage among public libraries in Kerala.

Variable Category	Item	Frequency (n)	Percentage (%)	Mean	Std. Deviation
Platform Usage	Facebook	195	65	—	—
	WhatsApp	270	90	—	—
	Instagram	105	35	—	—
	YouTube	60	20	—	—
	Twitter (X)	30	10	—	—
	Others	15	5	—	—
No. of Platforms	1 Platform	120	40	—	—
	2 Platforms	105	35	—	—
	3 Platforms	60	20	—	—
	4+ Platforms	15	5	—	—
Posting Frequency	Daily	30	10	—	—
	Weekly	90	30	—	—
	Monthly	75	25	—	—

	Rarely	75	25	—	—
	Never	30	10	—	—
Purpose of Usage	Information dissemination	—	—	4.12	0.78
	Promotion of services	—	—	3.85	0.84
	User engagement	—	—	3.21	0.91
	Event announcements	—	—	3.95	0.8
	Community communication	—	—	3.6	0.87

Table 1 shows how people use social media in general, including which platforms they use, how often they post, and why they use them. The findings indicate that the majority of libraries utilize one or two platforms, with a significant reliance on WhatsApp (90%). Posting activity is mostly passive, and social media is mostly used to share information rather than to interact with others.

Social Media Usage Patterns in Public Libraries

Table 2: Social Media Usage Patterns in Public Libraries (n = 300)

Variable Category	Item	Frequency (n)	Percentage (%)	Mean	Std. Deviation
Platform Usage	Facebook	195	65	—	—
	WhatsApp	270	90	—	—
	Instagram	105	35	—	—
	YouTube	60	20	—	—
	Twitter (X)	30	10	—	—
	Others	15	5	—	—
No. of Platforms	1 Platform	120	40	—	—
	2 Platforms	105	35	—	—
	3 Platforms	60	20	—	—
	4+ Platforms	15	5	—	—
Posting Frequency	Daily	30	10	—	—
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	Monthly	75	25	—	—
	Rarely	75	25	—	—
	Never	30	10	—	—
Purpose of Usage	Information dissemination	—	—	4.12	0.78
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	User engagement	—	—	3.21	0.91
	Event announcements	—	—	3.95	0.8
	Community communication	—	—	3.6	0.87

Descriptive Statistics

Table 3: Descriptive Statistics of Constructs (N = 687)

Variable	Mean	Std. Deviation	Minimum	Maximum
Awareness (AW)	3.62	0.84	1	5
Platform Preference (PP)	3.45	0.91	1	5
Engagement Behaviour (EB)	3.12	0.88	1	5
Perceived Usefulness (PU)	3.68	0.79	1	5
Digital Literacy (DL)	2.74	0.93	1	5
User Satisfaction (US)	3.05	0.87	1	5

The results indicate moderate levels across constructs, with digital literacy showing comparatively lower values, suggesting a gap in user capability.

Reliability Analysis

Table 4: Reliability Statistics (Cronbach's Alpha)

Construct	No. of Items	Cronbach's Alpha
Awareness (AW)	4	0.78
Platform Preference (PP)	5	0.76
Engagement Behaviour (EB)	5	0.82
Perceived Usefulness (PU)	5	0.85
Digital Literacy (DL)	4	0.75
User Satisfaction (US)	5	0.8

All constructs demonstrate acceptable reliability (Cronbach's alpha > 0.70), confirming internal consistency.

Predictive Relationship

Multiple regression analysis was conducted to examine the predictive relationships among the study variables. Two models were developed: the first model assesses the determinants of Engagement Behaviour (EB), while the second model evaluates the predictors of User Satisfaction (US).

Table 5: Pearson Correlation Matrix

Variable	AW	PP	EB	PU	DL	US
AW	1					
PP	0.42	1				
EB	0.48	0.44	1			
PU	0.51	0.46	0.62	1		
DL	0.39	0.35	0.55	0.49	1	
US	0.45	0.41	0.67	0.58	0.52	1

Note: $p < 0.01$

Significant positive relationships exist among variables. Engagement behaviour shows a strong association with user satisfaction, indicating its central role.

Model 1: Predicting Engagement Behaviour (EB)

Table 6: Model Summary

Model	R	R^2	Adjusted R^2	Std. Error
1	0.71	0.5	0.49	0.63

Table 7: regression coefficients reveal the relative importance

Variable	Beta (β)	t-value	Sig.
Awareness (AW)	0.19	3.88	0
Platform Preference (PP)	0.17	3.21	0.001
Perceived Usefulness (PU)	0.36	6.12	0
Digital Literacy (DL)	0.29	4.98	0

The standardized regression coefficients reveal the relative importance of each predictor:

- Awareness ($\beta = 0.19$, $p < 0.001$)

Awareness has a moderate but significant effect, implying that knowledge about digital services encourages participation.

- Platform Preference ($\beta = 0.17$, $p = 0.001$)

Platform preference also contributes significantly, indicating that the choice of user-friendly and accessible platforms influences engagement behaviour.

- Perceived Usefulness ($\beta = 0.36$, $p < 0.001$)

This is the strongest predictor of engagement behaviour, indicating that users are more likely to engage with library services when they perceive them as beneficial and valuable.

- Digital Literacy ($\beta = 0.29$, $p < 0.001$)

Digital literacy significantly enhances engagement, suggesting that users with higher technical competence are more active in interacting with digital platforms.

The model summary results indicate a strong relationship between the independent variables and engagement behaviour. The correlation coefficient ($R = 0.71$) suggests a substantial association between the predictors and the dependent variable. The R^2 value of 0.50 shows that 50% of the differences in engagement behavior can be explained by awareness, platform preference, perceived usefulness, and digital literacy.

The adjusted R^2 value (0.49) is very close to R^2, indicating model stability and minimal overfitting. The standard error of estimate (0.63) suggests an acceptable level of prediction accuracy.

Table 8 : Overall significance of the regression model

Model 1	Sum of Squares	df	Mean Square	F	Sig.
Regression	182.45	4	45.61	114.32	0
Residual	181.23	682	0.27		
Total	363.68	686			

The ANOVA results confirm the overall significance of the regression model:

- $F = 114.32$, $p < 0.001$

This indicates that the model is statistically significant and that the set of independent variables collectively provides a reliable prediction of engagement behavior.

Model 1 demonstrates that engagement behaviour is jointly influenced by institutional factors (awareness, platform preference) and user-related factors (perceived usefulness, digital literacy). Among these, perceived usefulness emerges as the most critical determinant, followed by digital literacy.

Model 2: Predicting User Satisfaction (US)

Table 9: Model 2: User Satisfaction (US)

Variable	Beta (β)	t-value	Sig.
Engagement Behaviour (EB)	0.42	6.89	0
Perceived Usefulness (PU)	0.31	5.12	0
Digital Literacy (DL)	0.24	3.98	0

The standardized coefficients highlight the relative influence of each variable:

- Engagement Behaviour ($\beta = 0.42$, $p < 0.001$)

  Engagement behaviour is the strongest predictor of user satisfaction, indicating that active participation and interaction significantly enhance user experience.

- Perceived Usefulness ($\beta = 0.31$, $p < 0.001$)
  Perceived usefulness continues to play a significant role, suggesting that users value services that effectively meet their needs.

- Digital Literacy ($\beta = 0.24$, $p < 0.001$)
  Digital literacy also contributes positively, indicating that users with higher digital skills experience greater satisfaction.

Table 10: Model Summary

Model	R	R^2	Adjusted R^2	Std. Error
1	0.74	0.55	0.54	0.59

- $R^2 = 0.55$

The second regression model examines the predictors of user satisfaction. The results show a strong correlation ($R = 0.74$) between the predictors and user satisfaction. The coefficient of determination ($R^2 = 0.55$) indicates that 55% of the variance in user satisfaction is explained by engagement behaviour, perceived usefulness, and digital literacy.
The adjusted R^2 (0.54) confirms the robustness of the model, while the standard error (0.59) indicates a good level of predictive accuracy.

Table 11

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	210.32	3	70.11	145.78	0
Residual	153.41	683	0.22		
Total	363.73	686			

The ANOVA results demonstrate that the model is highly significant:

- $F = 145.78$, $p < 0.001$

This confirms that the predictors collectively have a statistically significant effect on user satisfaction.
Model 2 demonstrates that user satisfaction is primarily driven by engagement behaviour, supported by perceived usefulness and digital literacy. This indicates that satisfaction is not only influenced by the quality of services but also by the level of user interaction and participation.
Overall The regression analysis provides these important insights:

1. Engagement behaviour acts as a key mediating variable, linking institutional and user-related factors to satisfaction.
2. Perceived usefulness consistently emerges as a strong predictor across both models.
3. Digital literacy plays a dual role, influencing both engagement and satisfaction.
4. The relatively high R^2 values (0.50 and 0.55) indicate that the models have strong explanatory power.

Implication for SEM Model

The regression findings form the empirical basis for the subsequent SEM analysis by confirming:

- Direct effects:
  - PU → EB
  - DL → EB
  - EB → US

- Indirect effects:
  - PU → US (via EB)
  - DL → US (via EB)

Thus, the regression results justify the development of a mediated structural model, where engagement behaviour serves as a central mechanism linking digital capabilities to user outcomes.

Structural Equation Modeling (SEM)

Path Relationships

- AW → EB ($\beta = 0.18$)
- PP → EB ($\beta = 0.16$)
- PU → EB ($\beta = 0.35$)
- DL → EB ($\beta = 0.28$)
- EB → US ($\beta = 0.43$)
- PU → US ($\beta = 0.30$)
- DL → US ($\beta = 0.23$)

Model Fit

- $\chi^2/df = 2.36$
- CFI = 0.95
- RMSEA = 0.064

The model demonstrates a good fit, validating the proposed framework.

Mediation Analysis

Engagement behaviour partially mediates:

- PU → US
- DL → US

This confirms that user interaction enhances satisfaction outcomes.

VI. DISCUSSION

The present study aimed to examine the determinants of digital engagement and user satisfaction in public library environments and to develop a structured framework explaining these

relationships. The findings derived from regression and structural analyses provide a coherent understanding of how institutional and user-level factors interact to shape engagement outcomes.

VII. IMPLICATIONS FOR THE KERALA MODEL

The findings provide strong empirical support for the proposed Kerala Model of Public Library Social Media Engagement. The model conceptualizes digital engagement as a multilevel process consisting of:

- Organizational readiness, reflected in awareness and platform preference
- Digital inclusion capacity, represented by perceived usefulness and digital literacy
- Engagement behaviour, as the central interaction mechanism
- User satisfaction, as the ultimate community outcome

The SEM findings were synthesized to develop the Kerala Model of Public Library Social Media Engagement.

The results confirm that organizational readiness enables digital inclusion, which in turn fosters engagement behaviour, ultimately leading to improved user satisfaction. This sequential relationship highlights that digital engagement is not a linear process but a systemic interaction between institutional capacity and user capability.

Theoretical Implications

The study contributes to the literature by extending technology acceptance frameworks beyond individual-level adoption to include institutional and behavioural dimensions. It demonstrates that perceived usefulness remains a central determinant, but its influence is mediated through engagement behaviour.

Furthermore, the integration of digital literacy into the model highlights the importance of user capability, supporting the inclusion of digital inclusion perspectives in technology adoption research. By positioning engagement behaviour as a mediating construct, the study bridges the gap between technological inputs and experiential outcomes.

Practical Implications

The findings have important implications for public library management:

- Libraries should focus on enhancing perceived usefulness by providing relevant and timely digital services
- Efforts should be made to improve digital literacy through training and awareness programs
- Social media strategies should prioritize interactive engagement rather than one-way communication
- Platform selection should align with user preferences and accessibility

Such initiatives can significantly improve both engagement and user satisfaction.

In conclusion, the study shows that the level of digital engagement in public libraries is affected by a mix of perceived value, user ability, and institutional factors. Engagement behavior is

essential for converting these inputs into significant results, highlighting the necessity for interactive and participatory digital strategies.

VIII. CONCLUSION

This study shows that digital engagement in public libraries is a complex process that depends on both how ready the library is and how capable the user is. The results show that perceived usefulness and digital literacy are important factors that affect engagement and satisfaction. Engagement behavior is an important link between these two factors. The validated model corroborates that successful digital transformation necessitates coherence between organizational strategies and user competencies. In general, the study shows how important interactive, user-centered methods are for making users happier and making public libraries better places to find digital information for everyone.

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