

A Human-Centric Design Framework for Digital User Fulfilment in Online Food Delivery Platforms

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Abstract

This study examines how online food delivery platforms can be designed to enhance Digital User Fulfilment (DUF) for frequent users in high frequency digital service contexts. Building from Self-Determination Theory and supported by post-use evaluative and value-alignment perspectives, the study conceptualizes fulfilment as a system-level outcome enabled by three platform provisions: Autonomy-Facilitating Design (AFD), Efficacy-Supporting Design (ESD), and Sustainability-Aligned Practices (SAP). Survey data were collected from high-frequency users of online food delivery platforms, each having placed at least six orders in the previous three months, ensuring repeated interaction with the system. The proposed model was tested using PLS-SEM (estimated using SmartPLS4). The results indicate that autonomy-facilitating and efficacy-supporting design features have significant direct effects on digital user fulfilment, while sustainability-aligned practices emerge as the strongest driver and a key mediator. These findings suggest that users meaningfully relate to sustainability-oriented platform practices, and that this relationship can be strategically leveraged by platform engineers to support stable interaction and enhance system productivity. The study contributes to engineering and operations management literature by demonstrating that sustainability-aligned design is not merely an ethical consideration but a productivity-enhancing lever in high-frequency digital service systems. Practically, it offers actionable guidance to achieve productive digital engagement.

Keywords

Digital User Fulfilment, Human-Centric Platform Design, Sustainability-Aligned Practices, Productivity-Oriented Digital Engagement, Online Food Delivery Platforms.

1. Introduction

In the current digital era online food delivery services are a dominant consumer touchpoint especially for high frequency users (Runruangjit & Charoenpornpanichkul, 2023). The manner in which the high frequency users connect with online food services is unique (Zhuang et al., 2021). Consumers of online food delivery services seek a fusion of convenience, efficiency, and on-demand satisfaction (Yeo et al., 2017). Consequentially, there has been a significant increase in platform investments on models based on machine learning towards managing operations in real-time and replacing standardized algorithms and heuristics with customized solutions to address specific problems (Ashraf & Bardhan, 2024). Platforms also need to modify their stochastic scheduling and routing challenges, which are impacted by huge fluctuations in demand for meal deliveries (Zhao et al., 2025). Therefore, building a deep and ongoing understanding, from a customer-centric perspective, is necessary to increase the platform's Digital User Fulfilment (DUF) and strengthen operational efficiencies. This in turn would facilitate opportunities for the food delivery platform's growth (Schlagwein et al., 2024).

Although extant literature has examined the influences on consumer behavior regarding online food platforms, several critical gaps remain. Prior studies have focused on functional aspects and individual elements, such as delivery, including the impact of late deliveries on repurchase behaviors (Harter et al., 2024), speed of deliveries, or customer satisfaction. Hedonism, orientation towards price saving and trust are some of the factors contributing towards online food delivery services user experience (Ahmad et al., 2025). Some studies have examined service quality and customer satisfaction within digital platforms (Suhartanto et al., 2018).

Furthermore, previous studies such as Ray et al. (2019) have focused on the drivers of motivation for online food delivery service apps building on the Uses and Gratification Theory (UGT) (Ruggiero, 2000). However, they have not holistically explored how intrinsic motivation based mechanisms interact and contribute toward building digital sustainability through DUF for online delivery platforms, especially through the lens of Self Determination Theory (SDT), and particularly in emerging markets, such as India. This presents a critical gap is the modeling of DUF with belief-based constructs using the theoretical lens of SDT.

In a departure from traditional applications of SDT, this study extends the theory into a digital platform context by examining how Autonomy Facilitating Design (AFD), Efficacy Supporting Design (ESD) and Sustainability Aligned Practices (SAP) collectively influence Digital User Fulfilment (DUF). The study proposes that fulfilment and sustainability in digital services arise not only from functional performance but also from how platform design supports user control, decision efficacy, and sustainability alignment in repeated interactions.

1.1 Research gaps

In terms of defining food delivery behavior for high frequency, AFD is a defining feature in the context of time efficiency and ease-of-use (Cho et al., 2019). Some studies have found that consumers increasingly associate digital service efficiency with platform success (Kimes, 2011). Moreover, High frequency navigating between their careers, education, and social lives opt for services that remove routine work, such as cooking (Ray et al., 2019).

However, convenience is not a transactional attribute; it is a lifestyle enabler that demonstrates broader digital engagement habits. Hence, its impact on satisfaction should be measured considering its cognitive and experiential resonance in belief-based models (Michalco et al., 2015).

Second, it is important to understand the role of post-usage evaluations regarding such aspects as pricing transparency, variety, and user interface responsiveness of ESD (Atapattu et al., 2016). Empirical work, by contrast, has emphasized functional performance metrics without systematically considering how the service's characteristics harmonize with elements of pre-formed consumer beliefs and how the confirmation of the beliefs influences the perceptions of fairness and safety (Jin et al., 2013). This is particularly salient considering that online food ordering platform environments now increasingly utilize artificial intelligence (AI) and augmented reality (Naik et al., 2025) recommendations, affecting the consumer choice architecture (Cortes & Herrmann, 2021).

Third, the role of SAP (i.e., values related to eco-friendly packaging (Ting et al., 2025), food waste reduction, reduced carbon emissions,) should be investigated in PSN models. The global climate crisis is in the spotlight, and millennial consumers are increasingly aware of environmental considerations, expecting service providers to reflect their own values (White et al., 2019). However, the post-usage status of eco-conscious beliefs has received little attention with regard to how these beliefs translate to confirm DUF judgments. Past studies have examined environmental concerns as an antecedent of purchase (Roh & Park, 2019), but few have explored how sustainable practices affect service evaluations within the digital food ordering context.

1.2 Research questions

This study poses three interrelated research questions (RQs) to address the identified research gaps.

RQ1: How does Autonomy Facilitating Design (AFD) impact Digital User Fulfilment(DUF) in the context of online food delivery platforms?

RQ2: How does Efficacy Supporting Design (ESD) impact Digital User Fulfilment (DUF) in the context of online food delivery platforms?

RQ3: How does Sustainability Aligned Practices (SAP) impact Digital User Fulfilment (DUF) in the context of online food delivery platforms?

1.3 Research objectives

This study poses the following research objectives (ROs) to address the research questions.

RO1: To examine the influence of AFD on DUF among frequent consumers of online food delivery platforms.

RO2: To examine the influence of ESD on DUF among frequent consumers of online food delivery platforms.

RO3: To examine the influence of SAP on DUF among frequent consumers of online food delivery platforms.

2. Literature review

SDT is based on individuals motivation (Deci & Ryan, 1985). It refers to an individual's motivation to pick-up and control a choice that they made. This is used to explain why users decide to keep using OFD platforms. SDT consists of the following constructs:

1. Autonomy. This is typically described as needs for people to feel that their behavior is their choice (Deci et al., 1989).
2. Competence. This refers to the user's desire to feel competent and efficient in their interactions with the system (Barber, 1983). It was identified that there are three trust factors in social relations: this includes competence, persistence and fiduciary responsibility.
3. Relatedness. This is the innate human desire to be connected, to love and be loved and to belong.

Across different context, SDT can be used as a robust framework to understand how satisfaction of basic psychological needs fosters positive attitudes, voluntary motivation and sustained behavioral intention. Multiple studies consistently highlight the centrality of psychological needs in shaping attitudes, motivations and behavioral intentions. Lee and Kim (2024) emphasized that perceived value and voluntary motivations, rooted in SDT, strongly influences users' positive attitude and their intention to reuse food delivery apps. Likewise, Appolloni et al., (2023) applied SDT during the COVID-19 pandemic showing how consumer psychological needs directly shaped purchasing decisions across varied consumer profiles.

Few studies extended SDT beyond consumer behavior, Al-Jubari et al. (2018) integrated SDT with Ajzen's Theory of Planned Behaviour (TPB) to reveal the student's entrepreneurial intention by psychological needs, which affects attitudes and subjective norms. While Syed et al., (2021) demonstrated that intrinsic motivational forces of autonomy, competence and relatedness significantly predicted purchase intentions, particularly within the context of halal food consumption.

With the increased digitization of food services, online food ordering platforms are growing, enabling consumers to connect with a variety of food providers digitally. Individuals' daily use of mobile apps and algorithmic interfaces has created an experiential space that goes beyond product quality and is increasingly driven by (or at least perceived to be influenced by) user experience, understood as a multidimensional construct that includes efficiency, satisfaction, trust, emotional engagement, and post-use reflection. (Zhao & Bacao, 2020). Among digitally savvy consumers, whose consumption is characterized by digital fluency, time scarcity, and value-driven preferences, user experience is also shaped by technological affordances and belief-driven expectations (Chen et al., 2020). While several studies have examined satisfaction and service quality in online food ordering platforms, few have leveraged intrinsic motivations view using SDT to systematically investigate digital sustainability.

2.1 Digital User Fulfilment

In SDT, DUF represents the fulfilment of three fundamental psychological needs—autonomy, competence, and relatedness—that collectively promote self-motivation and well-being (Deci & Ryan, 2000). Within the context of online food delivery, DUF extends beyond basic satisfaction with service performance to encompass the user's cognitive, emotional, and ethical alignment with the platform.

For High frequency consumers, DUF manifests through experiences that offer choice freedom, digital mastery, and value congruence. These consumers expect platforms to be fast, transparent, and personalized, while simultaneously reflecting their environmental and ethical priorities (Chen et al., 2020; Yeo et al., 2017). When online food platforms enable seamless navigation, trustworthy transactions, and visible sustainability cues—such as eco-friendly packaging or responsible sourcing—they fulfil not only functional expectations but also deeper psychological needs related to self-efficacy, authenticity, and connectedness.

Hence, DUF in digital ecosystems is a belief-mediated construct—shaped by users' internal motivations rather than by transactional outcomes alone. Platforms that satisfy autonomy through flexible ordering, competence through transparent feedback systems, and relatedness through pro-environmental practices are more likely to foster lasting engagement, trust, and advocacy (Roh & Park, 2019; Pillai et al., 2022). This reconceptualization positions DUF as the psychological foundation of digital sustainability, integrating intrinsic motivation with value-driven digital behaviour among High frequency consumers.

2.2 Autonomy Facilitating Design and Digital User Fulfilment

It has been established that the fast-paced urban lifestyle is driven by the pursuit of convenience and time efficiency, making online services particularly appealing. According to Ray et al. (2019), convenience motivation is a belief-based orientation that focuses on ease of ordering, flexibility in delivery scheduling, and decreased effort in meal preparation in the context of online food ordering platforms (Ray et al., 2019). Thus, time efficiency reflects a functional benefit consistent with the temporal context of High frequency who have to balance their work, study, and social life (Cho et al., 2019).

In addition, consistent with the research of Ray et al. (2019), convenience is a major determinant in food delivery app usage, overriding concerns about loyalty or pricing. Similarly, Yeo et al. (2017) noted that perceived ease-of-use and delivery speed significantly influence positive service experiences and behavioral intentions specifically among High frequency who expect 'seamless' digital navigation (Yeo et al., 2017). Increased investments in AI-enabled recommendation systems, predictive logistics, and real-time tracking are also driven by the demand for instant gratification and frictionless service, which collectively reinforce the perception of convenience and efficiency (Kimes, 2011). Within the SDT framework, such autonomy-supportive experiences strengthen intrinsic motivation, as users perceive the platform to enable freedom of choice and facilitate the management of personal goals and routines (Deci & Ryan, 2000).

Therefore, convenience should not be viewed merely as a functional or operational outcome but as a belief-based antecedent embedded within users' cognitive schemas and motivational systems. When platforms provide consumers with autonomy in customizing delivery time, food options, and payment modes, these features fulfill an essential psychological need for self-direction, which directly contributes to DUF. Moreover, autonomy-supportive platforms that simultaneously uphold sustainability values (through eco-friendly options and transparent operations) are likely to strengthen SAP which mediates the relationship between autonomy and overall psychological fulfillment.

Based on the literature, this study proposes the following hypotheses:

H1: AFD has a significant positive impact on DUF in online food ordering platforms.

H2: AFD significantly influences DUF through the mediating effect of SAP in online food ordering platforms.

2.3 Efficacy Supporting Design and Digital User Fulfilment

Within SDT, competence reflects an individual's need to feel capable, effective, and confident while engaging in a task (Deci & Ryan, 2000). In the context of online food delivery platforms, ESD represents users' belief that the platform empowers them to make informed and successful decisions—whether through clear pricing, transparent reviews, or efficient order management systems.

For High frequency consumers—digitally adept, information-savvy, and value-driven—competence is expressed through their ability to navigate apps with ease, locate preferred cuisines, compare options, and optimize choices based on both convenience and ethics (Cho et al., 2019; Ahmad, 2023). Platforms that enhance this sense of mastery—via intuitive design, real-time feedback, and reliable service quality—strengthen intrinsic motivation and foster deeper engagement. Transparent communication of pricing structures, delivery times, and restaurant ratings reinforces perceptions of fairness and control, satisfying users' competence needs while simultaneously building trust and digital resilience (Annaraud & Berezina, 2020; Ardiansyahmiraja et al., 2023).

Moreover, competence support extends beyond functional usability to encompass belief-driven dimensions of safety, reliability, and fairness. When users feel capable of identifying sustainable restaurants, evaluating eco-friendly practices, and making responsible choices, they experience enhanced competence that aligns with their pro-environmental values. This alignment strengthens SAP which mediates the relationship between competence and overall DUF, thereby illustrating how environmental consciousness reinforces intrinsic motivation in digital contexts. Based on the literature, we posit the following hypothesis:

H3: ESD has a significant positive impact on DUF in online food ordering platforms.

H4: ESD significantly influences DUF through the mediating effect of SAP in online food ordering platforms.

2.4 Sustainability Aligned Practices and Digital User Fulfilment

Within the framework of SDT, relatedness refers to individuals' need to feel connected to others and to align with shared values or causes (Deci & Ryan, 2000). Extending this concept to the digital sustainability context, SAP captures the extent to which users feel psychologically connected to a platform's eco-conscious initiatives and sustainability orientation. This connection is not merely functional but deeply symbolic, reflecting how High frequency consumers' personal values of environmental care and ethical consumption resonate with platform practices (White et al., 2019; Wahid et al., 2024).

As environmental awareness increasingly defines High frequency's consumption logic, digital food delivery platforms that demonstrate visible, credible, and consistent sustainability practices—such as eco-friendly packaging, food waste reduction (Salem et al., 2025) and carbon-neutral delivery—fulfil users' need for value congruence. This perceived alignment fosters trust and emotional resonance, reinforcing users' sense of belonging to a larger sustainability ecosystem (Zhao & Bacao, 2020; Ahmed et al., 2020). When users perceive that their eco-values are mirrored in platform design and communication, they experience enhanced DUF through meaningful relatedness. Conversely, superficial or inconsistent sustainability claims (e.g., “greenwashing”) lead to dissonance and reduced affective attachment, despite efficient service delivery (Kumar et al., 2021). Thus, SAP acts as both a belief-based and motivational construct—a psychological bridge connecting personal environmental beliefs with digital platform engagement. In this sense, eco-friendly choices, carbon-reduction metrics, and sustainable restaurant partnerships are not only operational attributes but serve as cues of moral alignment, affirming high frequency users' self-concept as responsible digital citizens. Platforms that foster such environmental relatedness enable consumers to experience authenticity, pride, and purpose, which in turn strengthens their overall satisfaction, loyalty, and psychological well-being (Guo & Mantravadi, 2024; Krishna et al., 2023). Based on the literature this study proposes the following hypothesis:

H5: SAP has a significant positive impact on DUF in online food ordering platforms.

The conceptual framework developed based on the abovementioned literature and SDT theory is outlined in Figure 1.

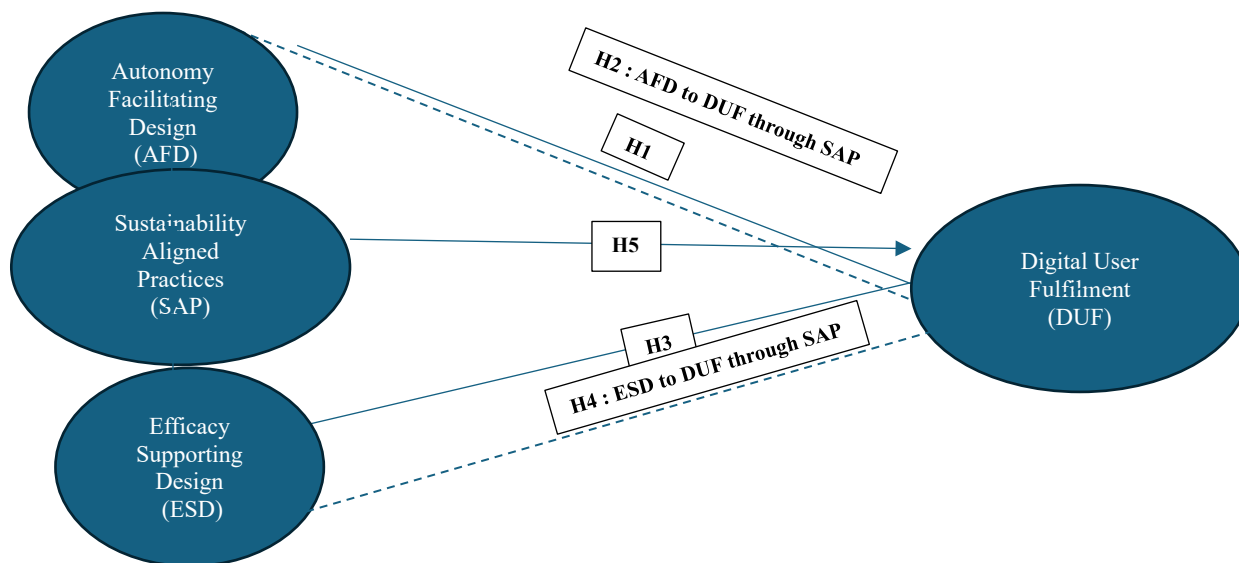


Figure 1. Conceptual framework

Note: thick lines indicate direct impacts, and dotted lines indicate indirect impacts

3. Methodology

3.1 Data collection

This research was conducted among High frequency consumers from Tier-I and Tier-II cities of India who have placed at least 6 orders in the previous three months on food delivery platforms.

The primary data collection tool was online Google forms that were circulated to the respondents through purposive sampling via mobile. The online questionnaire, which comprised of a series of statements to test the loading items were rated on a five-point Likert scale a format which is used online in studies conducted for measuring belief-based constructs (Ray et al.,2019) where 1 = strongly disagree, 2 = disagree, 3 = neither disagree nor agree, 4 = agree, and 5 = strongly agree.

The online survey questionnaire was pretested among 75 respondents (not included in the final analysis) for clarity and reliability before the online deployment. The online questionnaire explained to the participants the reason for conducting the survey as a part of the study and also indicated that it would take approximately 12-15 minutes to complete. Respondents were assured that the responses they shared would be kept confidential and used for research purposes only. The questionnaire concluded by thanking the respondents for their participation.

3.2 Sampling

A total of 1,750 digital food ordering consumers were contacted online, of whom 955 responded. From these responses, 126 were discarded for failing to meet the order frequency criterion. Another 53 responses were discarded as part of data cleaning. The final sample achieved for purposes of analysis was 776, with a response rate of 44.3%. This sample size has a 95% confidence level (Byrne, 2013) and thus statistically valid, with a margin of error lower than 10%.

3.3 Ethical considerations

All participants gave informed consent before commencing to participate in the survey. Participants were informed about the research purpose, the voluntary nature of participation, and their right to withdraw at any time.

4. Data analysis and results

4.1 Demographic analysis

Table 1 presents demographic variables, including sex and frequency of ordering from online food delivery services. The results demonstrated that more male respondents (n = 451) met the study criteria versus female respondents (n = 325).

Table 1. Demographics and frequency of ordering analysis of respondents

Respondent Demographics			
		Respondents	Percentage %
Sex	Male	451	58.1
	Female	325	41.9
Total		776	100.0

4.2 Analysis of measurement model

The conceptual framework highlighted in Figure 1 was tested using the measurement model shown in Figure 2.

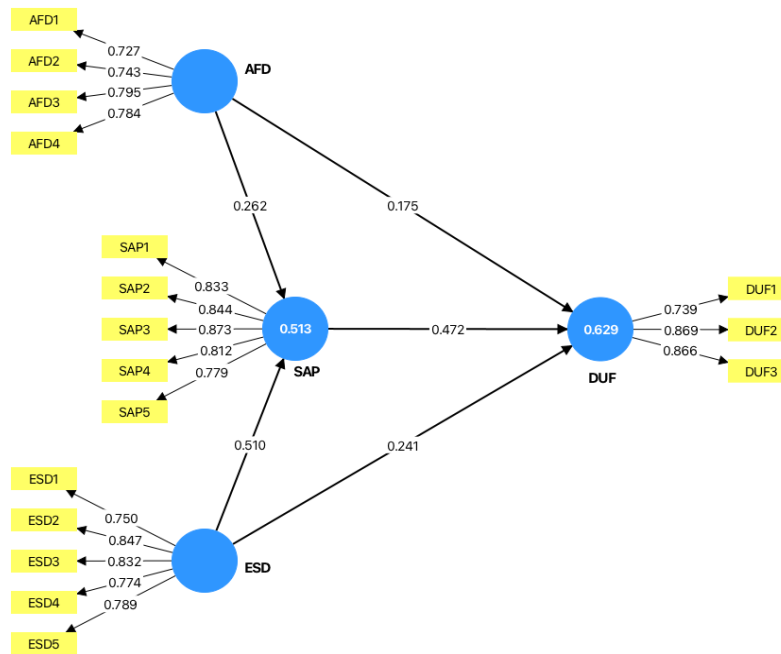


Figure 2. Analysis of the measurement model using SmartPLS4-SEM

The analysis reveals the relationship between the observed and latent variables in a specified investigation (Hair et al., 2011). To assess latent variables, several measurement items with numerical values were collected in the questionnaire.

Table 2 indicates the outer loadings for the measurement model used in Smart-PLS4 SEM. According to Hair et al. (2017), outer loadings should ideally exceed 0.6 to indicate good reliability of the reflective indicators. Loadings greater than 0.70 indicate very good reliability (Hair et al., 2017).

As Table 2 shows all the loadings for AFD, ESD, SAP and DUF are greater than 0.700, which can be considered very good.

Table 2. Outer loadings of measurement model

Items	
Autonomy Facilitating Design (AFD)	
AFD1: Food ordering platform allows me make choices as per my preferences.	0.727
AFD2: Food ordering platforms gives me flexibility in deciding when to order.	0.743
AFD3: Food ordering platforms enables me to manage my schedules effectively.	0.795
AFD4: Food ordering platforms provides features that help me decide independently.	0.784
Efficacy Supporting Design (ESD)	
ESD1: Food ordering platform gives me tools to make informed food choices.	0.750
ESD2: Food ordering platforms makes it easy to find good promotion deals.	0.847
ESD3: Food ordering platforms helps me find my preferred cuisines easily.	0.832
ESD4: Food ordering platforms provides information on high-quality options.	0.774

ESD5: Food orderings platforms make review ratings useful to rely upon.	0.789
Sustainability Aligned Practices(SAP)	
SAP1: My food ordering platform demonstrates eco-friendly practices while delivering.	0.833
SAP2: My food ordering platform shows efforts to reduce its carbon footprint.	0.844
SAP3: My food platform offers eco-friendly packaging options for deliveries.	0.873
SAP4: My food ordering platform provides options for eco-friendly cutlery.	0.812
SAP5: My food ordering platform supports efforts to reduce food wastage.	0.779
Digital User Fulfilment (DUF)	
DUF1: My food ordering platform consistently meets my expectations.	0.739
DUF2: I feel confident using the platform for my food orders.	0.869
DUF3: I trust my food ordering platform for my food needs.	0.866

4.3 Construct reliability

To determine the items' reliability and validity, the proposed model was tested using partial least squares structural equation modeling with SmartPLS4 (Sarstedt & Cheah, 2019). Table 3 presents the results of the measurement model analysis. Cronbach's alpha (CA) scores (Cronbach, 1951) over 0.70 and composite reliability (CR) values over 0.70 were used to determine the model's construct reliability (Hair et al., 2019). As the latent variables' CA values and CR values were above 0.70, construct reliability is confirmed.

Table 3. Results of construct reliability

Latent Variables	Cronbach's Alpha	Composite reliability (rho_a)	Composite reliability (rho_c)
DUF	0.766	0.773	0.866
AFD	0.760	0.763	0.847
SAP	0.885	0.887	0.916
ESD	0.858	0.859	0.898

4.4 Convergent validity

Average variance extracted (AVE) with a value over 0.50 was used to determine convergent validity (Fornell & Larcker, 1981). An AVE of 0.50 or greater signifies that the latent construct is responsible for 50% or more of the variance in the observable variables, on average. Table 4 presents the AVE for all latent variables. As the AVE is greater than 0.5 for all the variables, convergent validity is confirmed.

Table 4. Results of convergent validity

Latent Variables	Average Variance Extracted
DUF	0.684
AFD	0.582
SAP	0.687

ESD	0.639
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4.5 Discriminant validity

To ensure that each latent variable is unique, according to discriminant validity (Fornell & Larcker, 1981), the beta coefficients of the constructs were compared with the corresponding square root of the AVE values. If the square root of the AVE is greater than the beta coefficients, discriminant validity is achieved (Fornell & Larcker, 1981).

Table 5 shows the results of the discriminant validity analyzed according to the Fornell–Larcker criterion. The square roots of the AVE values are represented in the diagonal elements highlighted in bold. As the table indicates, each latent variable is unique, given that the square roots of the AVE values for DUF, AFD, SAP, and ESD of 0.827, 0.763, 0.829 and 0.799 respectively, are greater than beta coefficients (correlations) mentioned in corresponding rows and columns along the diagonal. This confirms discriminant validity according to the Fornell–Larcker criterion.

Table 5. Results of discriminant validity: Fornell–Larcker criterion

Latent Variables	AFD	DUF	ESD	SAP
AFD	0.763			
DUF	0.632	0.827		
ESD	0.692	0.689	0.799	
SAP	0.615	0.746	0.691	0.829

Furthermore, it is crucial for each variable to load on to its own and not on other variables in order to explain the variance of the variable it is loaded on. Table 6 shows every item loaded very high on its own respective construct and loaded very low on the rest of the constructs, indicating the absence of cross-loadings.

Table 6. Cross-loadings

	AFD	DUF	ESD	SAP
AFD1	0.727	0.447	0.511	0.388
AFD2	0.743	0.475	0.467	0.531
AFD3	0.795	0.500	0.556	0.476
AFD4	0.784	0.504	0.578	0.467
DUF1	0.570	0.739	0.553	0.519
DUF2	0.492	0.869	0.572	0.662
DUF3	0.514	0.866	0.584	0.663
ESD1	0.559	0.538	0.750	0.611
ESD2	0.602	0.581	0.847	0.578
ESD3	0.560	0.571	0.832	0.540
ESD4	0.530	0.515	0.774	0.511
ESD5	0.508	0.542	0.789	0.512
SAP1	0.548	0.644	0.581	0.833
SAP2	0.501	0.634	0.537	0.844
SAP3	0.531	0.644	0.617	0.873
SAP4	0.437	0.585	0.579	0.812
SAP5	0.526	0.582	0.545	0.779

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4.6 Multicollinearity test

High correlations among independent variables may influence model estimation results. Hence, a multicollinearity test is conducted to check for the presence of high correlations. Multicollinearity exists if the variance inflation factor (VIF) value reaches 5 (Hair et al., 2019). As Table 7 shows, the highest VIF recorded in this study was 2.452, which was confirmed to be within the acceptable limits. Therefore, the presence of multicollinearity was deemed to be absent in the dataset.

Table 7. Multicollinearity results for inner model

	VIF
AFD -> SAP	1.919
AFD -> DUF	2.060
ESD -> SAP	1.919
ESD -> DUF	2.452
SAP -> DUF	2.053

4.7 Measurement of structural model

Coefficient of determination (R^2)

The explanatory power of the structural model in PLS is determined by the coefficient of determination or R^2 , which varies between 0 and 1 (Hair et al., 2019). A higher R^2 value implies better prediction of endogenous constructs. According to Hair et al. (2019), R^2 values of 0.75, 0.50, and 0.25 denote substantial, moderate, and weak prediction, respectively. The higher the value, the better the prediction power. The percentage of change in the dependent variable that the model could explain was shown by the R-square values.

As Table 8 illustrates, the analysis revealed that the model could account for approximately 62.9% of variations in DUF.

Table 8. R-square of the endogenous latent variable

Dependent Variable	R-Square	R-square adjusted	Comment
DUF	0.629	0.627	Substantial

4.8 Direct and mediating hypotheses

The structural model is assessed to verify the hypotheses after the validity of the whole measurement model has been established (Hair et al., 2019). The stated hypotheses that indicate the relevance of the relationships are either supported or not supported through this analysis. In this study, a bootstrapping setting with 5,000 samples (fixed seed, complete level of complexity, significance level of 0.05, and two-tailed test) was used to estimate the structural model (Hair et al., 2021).

4.9 Structural model: Hypothesis testing

Path coefficients (beta), t statistics, and corresponding p-values are displayed below for each hypothesis tested. The t-value is statistically significant in two-tailed testing when it is outside the range of -1.96 to $+1.96$, and the p-value is less than 0.05 (Byrne, 2013).

The following results are for the structural model analysis (direct effects).

H1: AFD has a significant positive impact on DUF in online food ordering platforms.
H1 was strongly supported, as the beta value is 0.175 and T-value 3.697

H3: ESD has a significant positive impact on DUF in online food ordering platforms.
H3 was strongly supported, as the beta value is 0.241 and T-value 4.924

H5: SAP has a significant positive impact on DUF in online food ordering platforms.

H5 was strongly supported, as the beta value is 0.472 and T-value 8.930

The following results are for the structural model analysis (indirect specific effects).

H2: AFD significantly influences DUF through the mediating effect of SAP in online food ordering platforms.

H2 was strongly supported, as the beta value is 0.124 and T-value 4.519

H4: ESD significantly influences DUF through the mediating effect of SAP in online food ordering platforms.

H4 was strongly supported, as the beta value is 0.240 and T-value 6.803.

5. Discussion

This study examines how frequent users derive digital user fulfilment (DUF) from online food delivery platforms through a human-centric design lens informed by Self-Determination Theory (SDT). The research extends SDT into a digital service context by operationalizing autonomy, competence, and value-based relatedness as platform design provisions—Autonomy-Facilitating Design (AFD), Efficacy-Supporting Design (ESD), and Sustainability-Aligned Practices (SAP). DUF is conceptualized as a system-level outcome reflecting trust, confidence, and expectation fulfilment in repeated digital interactions.

By focusing on frequent users, the study captures behavioural patterns of users who interact with platforms as part of routine consumption. For these users, engagement is shaped not only by convenience but also by how well the platform supports decision control, usability, and value alignment.

The findings indicate that autonomy-facilitating features operate as decision-enabling mechanisms rather than mere convenience tools. When users can exercise control over ordering choices, scheduling, and customization, interaction friction is reduced and fulfilment increases. This highlights the importance of designing systems that support user control in high-frequency digital services.

Efficacy-supporting design also emerged as a strong driver of DUF. Users experience higher fulfilment when platforms provide clear information, reliable reviews, transparent pricing, and responsive interfaces that support confident decision-making. These features strengthen system trust and interaction stability.

Sustainability-aligned practices play a distinctive role by functioning as value-alignment signals. Eco-friendly packaging options, waste-reduction initiatives, and carbon-conscious practices help signal responsible platform behaviour. When integrated into routine platform operations, these practices enhance trust and reinforce continued engagement. In this sense, sustainability operates as a design attribute that supports productive platform use rather than solely as an environmental commitment.

Collectively, the findings position digital sustainability as a function of human-centric system design rather than only technological efficiency. DUF emerges as a post-use evaluative outcome shaped by how well platforms support user control, decision efficacy, and sustainability alignment. This perspective highlights the role of platform design in enabling stable and productive digital service interactions.

6. Contribution to Theory

This study extends SDT into the domain of digital consumption by positioning DUF as the psychological foundation of Digital Sustainability. While SDT traditionally explains intrinsic motivation through autonomy, competence, and relatedness, this research reconceptualizes these needs as belief-based antecedents of sustainable digital engagement. The constructs—AFD, ESD, and SAP—together provide a multidimensional framework for explaining how high frequency users experience well-being and continuity within algorithmically mediated service ecosystems.

By integrating SDT with belief-driven evaluation, the study advances theoretical understanding in two ways. First, it reframes need satisfaction as a cognitive–emotional alignment rather than a purely motivational outcome, emphasizing that user fulfilment depends on the perceived congruence between platform design and user values. Second, it broadens the application of SDT beyond individual psychology to the digital sustainability paradigm, where user empowerment, competence, and eco-ethical relatedness jointly sustain long-term digital well-being. Thus, this research contributes to both SDT and digital service theory by establishing that sustainable digital engagement arises

not only from efficiency and performance but from the fulfilment of intrinsic psychological needs within ethically resonant, belief-aligned digital environments.

7. Contribution to Practice

This study provides a comprehensive framework that can be easily applied to food delivery platforms by sustainability officers, platform designers, and digital strategists to enhance customer satisfaction and loyalty. Implementing this approach also bridges the gap between operational decision-making and academic models by allowing platforms to align their services closely with emotional needs, values, and expectations of high frequency users (Annaraud & Berezina, 2020).

1. Understanding the core drivers of DUF

The most immediate and impactful takeaway for practitioners is the shift from viewing digital sustainability as the main outcome to a cognitively and emotionally driven experience present in SDT based motivators. In the past, online food ordering platforms were dependent on performance metrics such as food accuracy, delivery speed, and app responsiveness. However, understanding DUF is critical because the study shows that satisfaction is more deeply linked with the alignment between user intrinsic motivations and service characteristics (Atapattu et al., 2016).

In practical terms, this means that platforms are required to engage in value mapping because it is a strategic process to understand the deeper lifestyle, emotional, and ethical motivations of their user base. For example, High frequency consumers choose platforms that are not only convenient to use but exhibit values such as fair labor policies and sustainable practices that mirror their own. Platforms that ignore these emerging belief-based drivers may face problems in maintaining relevance even if their technical performance is strong (Pyöriä et al., 2017).

2. Improving Efficacy Supporting Design through perceived fairness and safety

This study also increases the understanding of service quality by including user beliefs around fairness, safety, and trust in algorithmic decision-making. These aspects are critical in an era when digital services are managed through opaque, AI-driven systems (Yeo et al., 2017).

Based on practice perspectives, the findings show the importance of transparent communication regarding delivery fees, estimated times, and surge pricing. Second, fairness is the key driver and shows how those practices are made visible to the customer. Moreover, safety guarantees, including hygienic food handling, emergency response protocols, and contactless delivery, are reliable for health protection (Ardiansyahmiraja et al., 2023).

Hence, online food delivery service platforms can use these insights to enhance the application experience and gain reputational advantages by showing their commitment to fairness and digital trust (Dutta et al., 2025).

3. Harnessing eco-consciousness for competitive advantage

In the DUF model, the inclusion of eco-conscious platform perception compels a strategic lever for differentiation. Because of global climate change, sustainability has moved from a niche concern to a mainstream expectation among high frequency consumers. The study findings show that when platforms reflect user beliefs around sustainability by offering carbon-neutral delivery and eco-friendly packaging they not only meet environmental goals but also enhance digital satisfaction and emotional engagement (Chopdar et al., 2018).

However, in reality, online food ordering platform services can implement green delivery options such as offset checkout choices and partner with restaurants that follow ethical sourcing practices, highlighting these practices in the application. Moreover, platforms can offer users the choice to opt out of receiving plastic containers or cutlery, reinforcing personal agency and environmental responsibility (Yang et al., 2024).

Second, it is important that these platforms communicate regularly and clearly regarding sustainability impacts. For example, they can show the cumulative environmental impact of eco-friendly choices (e.g., you saved 5 kg of plastic this year) to foster a sense of alignment between the platform and user and strengthen brand loyalty (Williady et al., 2025).

4. Guiding personalization and algorithm design

The study also offers practical implications for AI and recommendation systems, which are now deeply linked with digital platforms. These algorithms are trained solely on transactional behaviors, including ratings and past orders. Hence, they may miss users' SDT-driven and nuanced preferences. For example, users may prefer slower delivery if the service implements proper ethical sourcing and lower emissions (Ahmed et al., 2020).

Therefore, all online food ordering platforms can use these findings to train AI systems on both belief indicators and behavioral data. They can include sustainability preferences such as opt-ins for eco-packaging, user feedback on perceived fairness and quality, and responses to belief-related surveys or onboarding quizzes (Cho et al., 2019).

Through integrating SDT-based parameters into algorithmic learning, it is possible for platforms to make personalization highly meaningful and predictive. Such alignment can lead to a high retention rate and strong emotional bond with the platform (Atapattu et al., 2016).

5. Strategic implications for branding and positioning

A SDT based approach offers new directions for market positioning and branding in a highly competitive marketplace. Many platforms compete on operational capabilities such as the range of restaurants, discounts, and delivery speed. The study suggests that embedding SDT-aligned branding as the platform's core identity could become a powerful differentiator (Ahmad, 2023). For example, a brand could position itself as an ethical choice for mindful food ordering. The next focus on urban efficiency for busy professionals shows lifestyle enablement, and the third may lead to transparency and safety in algorithmic recommendations (Annaraud & Berezina, 2020).

Therefore, the move from performance-driven branding to SDT based branding requires a substantial marketing shift but organizational alignment must ensure that all systems, customer service, and partnerships reflect the stated values of platforms (Ahmed et al., 2020).

7. Managerial implications

The results indicate that DUF is shaped not only by functional performance but also by how clearly platforms support user control, decision efficacy, and value alignment.

- **Designing for user control:** Platforms should incorporate features that allow users flexibility in scheduling, customization, and choice. Such autonomy-facilitating features can reduce decision friction and improve ordering efficiency.
- **Decision-support tools:** Clear ratings, reliable reviews, transparent pricing, and accurate tracking systems strengthen user confidence and reduce uncertainty in high-frequency usage contexts.
- **Sustainability visibility:** Sustainability-related information—such as eco-friendly packaging options or waste-reduction initiatives—should be integrated into the interface in a visible but unobtrusive way. When sustainability cues are embedded in the decision flow, they can function as trust and alignment signals rather than promotional messages.

Implications for Platform Management and Digital Strategy

The findings suggest that long-term platform performance depends on balancing operational efficiency with user-centric design.

- **From efficiency to stability:** While speed and cost optimization remain important, platform managers should recognize that sustained productivity also depends on repeatable and low-friction interactions.
- **Policy transparency:** Clear refund policies, data protection measures, and fair pricing logic can reinforce system trust and reduce service recovery costs.
- **User segmentation by usage patterns:** Segmenting users based on ordering frequency and usage intensity allows platforms to allocate resources more effectively and tailor service features to heavy-use segments.

Implications for Sustainable Strategy

The study shows that sustainability-aligned practices influence fulfilment in high-frequency digital services.

- **Sustainability as an operational signal:** Eco-friendly packaging, reduced cutlery options, and food-waste initiatives should be treated as operational features rather than marketing add-ons.
- **Scalable sustainability integration:** Sustainability initiatives should be standardized across delivery operations, so they are perceived as consistent platform practices.
- **Link to productivity:** When sustainability practices align with user expectations, they can enhance trust and interaction continuity, indirectly supporting platform productivity.

8. Limitations

Although this research offers valuable practical and theoretical contributions, some limitations must be acknowledged to ensure a balanced interpretation of the findings. All of these limitations provide opportunities for future research to extend, refine, and validate the proposed SDT based model on the context of online food delivery services.

The main limitation is related to the scope of the study, which focused primarily on high frequency consumers. Therefore, such focus inherently limits the generalizability of the findings across other frequency groups, such as infrequent users. Each group demonstrates different digital behaviors, beliefs, and motivation systems that have a considerable influence on their satisfaction judgments. Therefore, future studies must consider comparative different frequency group analysis to examine whether the SDT model varies across digital fluency levels and usage frequency.

The second limitation is related to the study's geographic and cultural context, which can limit external validity. Various factors, including service quality (Parasuraman et al., 1988), perception of convenience, and eco-consciousness, are likely shaped by infrastructure, cultural norms, and national policies regarding digital services and sustainability. For example, consumers in highly developed urban environments may prioritize technological integration, whereas consumers in developing areas may focus on affordability and accessibility. Moreover, some cultural variations in environmental concerns and trust in digital platforms can influence the confirmation process differently. Therefore, future studies should include a cross-cultural or cross-regional sample to enhance the applicability and robustness of the findings.

Thirdly, longitudinal methods and insights would offer a deeper understanding of these SDT constructs as they evolve over time with customers' changing views on digital sustainability.

9. Implications for future research

We recommend that future research includes additional moderating variables to reveal other SDT related motivations, and a larger sample size should be used for nuance and detail. There is room for additional hypotheses to explain how changing platform services can affect home cooking habits compared with online ordering. Lastly, the impact of AI on one or all these factors should be investigated for its efficiency and potential intuitiveness regarding building DUF.

10. Conclusion

This study examined how Autonomy-Facilitating Design (AFD), Efficacy-Supporting Design (ESD), and Sustainability-Aligned Practices (SAP) jointly contribute to Digital User Fulfilment (DUF) among frequent users of online food delivery platforms in India. Drawing on Self-Determination Theory, the study translated autonomy, competence, and value-based relatedness into platform design provisions relevant to high-frequency digital service systems.

The findings highlight the particularly strong role of sustainability-aligned practices. SAP emerged not only as a direct predictor of digital user fulfilment but also as a key mechanism through which platform design influences stable and productive user engagement. This suggests that users do not treat sustainability features as peripheral add-ons but as meaningful signals that shape trust, confidence, and interaction continuity.

From an operations and engineering perspective, the results indicate that sustainability-aligned design can function as a productivity-enhancing lever. Platforms that integrate eco-friendly packaging options, waste-reduction initiatives, and transparent sustainability practices alongside autonomy-facilitating and efficacy-supporting features are better positioned to reduce interaction friction and maintain repeated use.

Overall, the study underscores that human-centric and sustainability-aligned platform design contributes not only to user fulfilment but also to more productive and resilient digital service systems. For food delivery providers, embedding sustainability within core platform design is therefore not merely an ethical consideration but a strategic design choice that supports long-term platform performance.

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