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UNDERSTANDING STUDENTS' RETENTION TO USE DIGITAL FOOD BANKS: AN EXTENDED UTAUT2 MODEL

Nur Alia Atirah Che Aznan[1], Nurul Hafizah Mohd Yasin[2*], Norsyamlina Che Abdul Rahim[3]

[1]Department of Wellness, Faculty of Hospitality, Tourism and Wellness, Universiti Malaysia Kelantan, Malaysia
aliaatirah.ca@umk.edu.my https://orcid.org/0000-0001-5297-6812
[2]Department of Wellness, Faculty of Hospitality, Tourism and Wellness, Universiti Malaysia Kelantan, Malaysia
hafizah.my@umk.edu.my https://orcid.org/0009-0008-4065-4830
[3]Department of Wellness, Faculty of Hospitality, Tourism and Wellness, Universiti Malaysia Kelantan, Malaysia
norsyamlina@umk.edu.my https://orcid.org/0000-0003-4045-6566

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Abstract:

The growing use of digital platforms in charitable food aid has led to the emergence of digital food banks, yet existing research shows limitations in technology acceptance models when explaining their adoption. Prior studies have largely focused on single user groups, particularly recipients, thereby overlooking the dual-user nature of digital food banks that involve both donors and recipients within a shared value-exchange system. This conceptual paper aims to address this gap by proposing an extended Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) framework to examine intention and use behaviour toward digital food bank platforms. Drawing on UTAUT, the paper highlights the roles of performance expectancy, effort expectancy, social influence, and facilitating conditions in shaping users' behavioural intention and use behaviour. By integrating insights from specific domain framing, this study offers a more comprehensive understanding of technology adoption within community-based digital food banks. The proposed framework offers a theoretical foundation for future empirical studies and provides practical implications for policymakers and platform developers seeking to enhance participation, sustainability, and effectiveness of digital food bank initiatives.

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Digital Food Bank, Intention to Use, UTAUT2, Performance Expectancy, Social Influence

Introduction

The issue of food insecurity within higher education has escalated from a peripheral welfare concern to a critical institutional challenge worldwide (Loofbourrow et al, 2023). Rising living costs, coupled with structural inequalities and insufficient financial aid, have intensified the vulnerability of students, particularly those in middle- and low-income demographics, to unstable food access (McKay, 2025). This growing concern has prompted higher education institutions to explore alternative mechanisms to support vulnerable students, not only in terms of physical well-being but also in improving academic performance and achieving institutional equity goals.

Historically, food banks have served as the primary mechanism for short-term relief. However, traditional physical food bank models are increasingly scrutinised for operational inefficiencies, fragmented supply chains, and, perhaps most critically, the stigma associated with queuing for aid (Tovey, 2023). In response to these limitations, the sector is witnessing a paradigm shift driven by digital innovation. The emergence of digital food bank platforms leveraging mobile applications, Artificial Intelligence (AI) and blockchain promises to revolutionize food aid by enhancing transparency, ensuring real-time inventory tracking, and protecting user dignity through anonymous access.

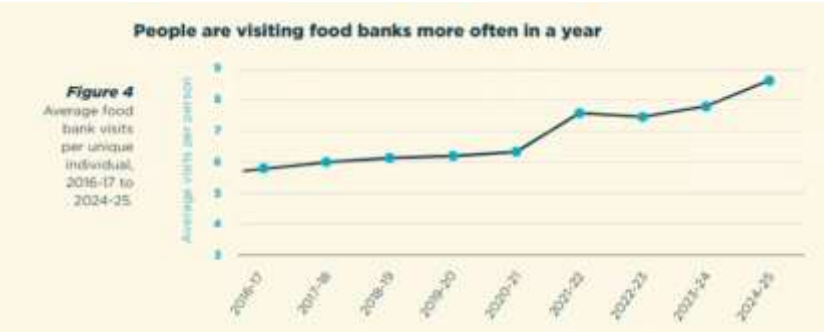

Figure 1: Individual Visiting Food Banks often from 2016-2017 to 2024-2025
Source: Global Food Banking Network (2025)

Despite these global advancements, the adoption of digital food banks remains uneven across different national contexts. Although digital solutions offer significant theoretical promise, empirical evidence suggests that their adoption remains uneven (Isa et al., 2025). In Malaysia, the digital food bank ecosystem operates within a complex environment characterised by

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digital inequality, infrastructural limitations, and privacy concerns (Perälä et al., 2024). These barriers disproportionately affect low-income students who, despite being the primary target beneficiaries, often lack the connectivity or digital literacy required to access these platforms (Arhimah et al., 2025). Consequently, the potential of digital food banks to function as inclusive student support mechanisms remains largely unrealized.

Existing scholarship has largely focused on the operational and nutritional aspects of food banks (Esmaeilidouki et al., 2023). While there is growing acknowledgement of digital systems, there is a scarcity of research applying robust technology adoption theories to understand the psychological and behavioural drivers of student usage. This study extends the UTAUT2 framework in two important ways. First, attitude is introduced as a mediating variable between UTAUT2 determinants and behavioural intention. Previous studies suggest that users' attitudes toward digital platforms significantly influence technology adoption in welfare-based digital services. Second, the study contextualizes UTAUT2 within a community-based digital food bank ecosystem, where participation involves multiple actors such as donors and recipients. Unlike commercial digital platforms where users typically share similar consumption motivations, digital food bank platforms operate through asymmetrical user roles. Donors are often motivated by altruism and social contribution, whereas recipients are primarily driven by accessibility, trust, and the need for food assistance. Therefore, incorporating this dual-user perspective further extends the explanatory capability of the UTAUT2 framework in understanding behavioural intention within digital food bank platforms.

Literature Review

Guided by the UTAUT2 framework and the proposed mediating role of attitude, the following section reviews key theoretical constructs that influence students' intention to use digital food bank platforms.

Performance Expectancy

In this study, performance expectancy refers to the extent to which Malaysian university students believe that a digital food bank is useful in facilitating faster and easier access to food aid while supporting efficient assistance management and daily academic functioning. It is support for academic daily functioning. Performance expectancy is also empirically found to be positively significant towards intention to use the digital food bank application (Suhardjono et al., 2022), making it another determinant by its significance in the current study's theoretical model.

Effort Expectancy

According to Carter and Belanger (2004), effort expectancy refers to the degree to which a system is perceived as easy to use, flexible, and simple to learn. It represents how well a system interface is designed, easy to use, flexible, scalable and simple to learn. Given this, it is assumed that the perceived ease of digital food banks would be easy to use without effort. The factor of effort expectancy has been found in the literature to significantly influence intention to use in several studies using the UTAUT model (Chen & Hwang, 2019; Dulle & Minishi-Majanja, 2011; Kabra et al., 2017; Oktal, 2013; Tosuntas¸, Karadag & Orhan, 2015).

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Attitude

Attitude plays an important role in enforcing emotional risk perception and behavioural intention (Bae and Chang, 2021). A positive attitude will stimulate college students to adopt the digital food bank experience technology (Tussyadiah, Wang, Jung, & Tom Dieck, 2018). In fact, attitudes are inherently subjective, and the uncertainty that someone had in their attitude is essentially an act of faith, confidence, or belief on behalf of the students (Tormala & Rucker, 2018). Social influence has been identified as an important antecedent of users' attitudes towards digital food bank platforms (Yang et al., 2017).

Retention to Use

Institutions of higher learning have access to the Malaysia Food Bank Programme with the (indiscernible) student food bank programme. Introduced at UiTMCPP on 15 February 2019, the initiative is intended to help counteract the high cost of living for students and make their financial load more manageable, in turn allowing them to dedicate more time to studies. Support will be given to B40 students under the initiative. As a result, such students are monitored by the SAD in each university and report student data to the ministry and university for further action (Berita Harian Online, 2019). The key driver for the setup of food banks in Malaysia is due to the excessive wastage of food, that are around 8,000 tonnes/day or represents approximately 60% of the daily household food (Kushairi, 2018).

UTAUT2

Hedonic Motivation

According to this study by Kadua, Safitri & Afiyah (2023), hedonic motivation has a significant influential effect on intention to use a digital food bank. Digital food banks provide several benefits for students, including easier access to food assistance and improved efficiency in food distribution. As an introductory information, looked on the role of digital food bank related to online version of food bank provides hedonic motivation among students. The intention to use the digital food bank was investigated by a researcher among university students. The model for research was UTAUT2 with attitude as mediating factor.

Price Value

According to the UTAUT2 model, students perceived value of using the digital food bank will be considered as positive when the benefits of ordering food conveniently and saving time and expenses for food have outweighed these costs, which can enhance their behavioural intention to reuse the system (Shaw & Sergueeva, 2019; Fatima et al., 2021). Results from technology and digital food banks indicate that stronger perceived value is positively related to stronger intention of use and purchase, which also supports the hypothesis that it could be applied to examine digital food bank intentions among university students (Shaw & Sergueeva, 2019).

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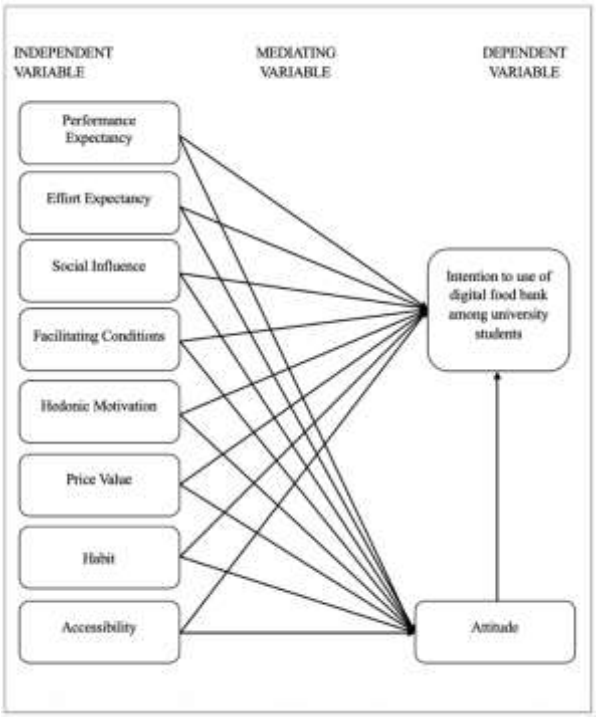

Figure 2: Research Framework

Methodology

Research Design

This study adopts a conceptual model development approach, integrating insights from the UTAUT2 framework and digital welfare literature to propose a theoretical model explaining students' retention to use digital food bank platforms. The proposed framework provides a conceptual basis for understanding how UTAUT2 constructs may influence behavioural intention within digital food bank ecosystems and offers directions for future empirical testing.

Sampling and Instrumentation

The target population comprises public university students in Malaysia, specifically those aware of or using digital food bank platforms. A purposive sampling technique is recommended to ensure respondents possess the necessary experience to evaluate the system's utility. Based on G*Power analysis, a minimum sample of 92 is required, though a target of 380 is suggested to minimise sampling error and accommodate Structural Equation Modelling (SEM) requirements.

The proposed instrument is a bilingual questionnaire in English and Malay adapted from established studies (Venkatesh et al., 2012), utilising 5-point Likert scales to measure constructs.

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Proposed Analysis Strategy

Data analysis will be conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) via SmartPLS.

1. **Measurement Model:** To assess reliability (Cronbach's Alpha, CR) and validity (AVE).
2. **Structural Model:** To test path coefficients and predictive relevance.
3. **Mediation Analysis:** To rigorously test the mediating effect of Attitude using bootstrapping and Variance Accounted For (VAF) methods.

Implications

Developers should prioritise privacy and anonymity feature within in the user interface. These features may include anonymous registration, masked user profile, and encrypted transactions to mitigate the stigma associated with seeking food aid, which often deters vulnerable users like university students from engagement (Idehai et al., 2024). Within the UTAUT2 framework, these elements positively enhance social influence by normalising aid-seeking through reduced visibility of participation, thereby fostering supportive peer norms and alleviating self- and social stigma that negatively predict adoption intentions (Su et al., 2025). Consequently, improved attitudes toward the technology mediate stronger behavioural intentions to use, promoting equitable access while upholding user dignity in welfare-oriented digital services (Tetri et al, 2024).

In the Unified Theory of Acceptance and Use of Technology (UTAUT), facilitating conditions denote the perceived organisational and technical support, including access to devices, data plans, and guidance, that enables individuals to employ new systems, exerting a direct influence on use behaviour independent of behavioural intentions (Xue et al., 2024). Applied to higher education, this construct obliges universities to furnish students with the requisite infrastructure for digital applications, such as e-learning platforms, lest resource deficiencies prevalent among socioeconomically disadvantaged learners convert ostensibly inclusive digital solutions into exclusionary barriers that widen the digital divide. Empirical evidence from university contexts affirms that robust facilitating conditions significantly enhance technology adoption, whereas their absence undermines equitable access and perpetuates disparities in educational outcomes.

Research underscores the imperative to reframe food banks' role, transitioning from residual charity models characterised by episodic, needs-based aid distribution to integrated, technology-enabled institutional support mechanisms that embed food assistance within broader social welfare systems (Warshawsky, 2025). These repositioning leverages digital platforms for streamlined eligibility verification, real-time inventory management, and predictive demand analytics, fostering sustainable, scalable interventions that mitigate food insecurity proactively rather than reactively (Hassoun et al., 2023). Empirical studies affirm that such technology-driven institutionalization enhances equity and efficiency, diminishing reliance on ad-hoc donations while aligning with UTAUT constructs like facilitating conditions to ensure accessible, user-centric support (Adiyono et al., 2025).

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Conclusion

The digitisation of food aid offers a promising avenue to address food insecurity among university students in Malaysia. However, technology alone is insufficient. This conceptual paper argues that the effectiveness of digital food banks depends on a complex interplay of functional expectancy, social influence, and, crucially, users' attitudes. By applying the UTAUT2 model with attitude as a mediator, this research provides a robust framework for understanding the behavioural intentions of vulnerable students. Ultimately, successful digital food banks must be designed not just as logistical tools but as user-centric platforms that uphold dignity, ensure accessibility, and foster positive behavioural habits.

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Ethics Statement: This study involves human participants in the form of university students who voluntarily participated in the survey. All responses were collected anonymously and used solely for academic research purposes.

Author Contribution Statement: Nurul Hafizah Binti Mohd Yasin was responsible for conceptualization and supervision of the study. Nur Alia Atirah Binti Che Aznan conducted conceptualization, data collection and analysis. Norsyamlina Binti Che Abdul Rahim contributed to literature review, manuscript drafting, and critical revision.

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