Examining the Sustainable Business Model of a Sharing Platform: A Case Study of the SDG SHARE+ App

Hsien-Cheng Wang[1], Ya-Wen Lin[2*], Chien-Hsiang Liao[2], Qing-Feng Lin[2], Shan-Ling Weng[3], and Shih-Wei Shen[2]
MEAN WELL Enterprises Co., Ltd., Taiwan[1]
Department of Information Management, Fu-Jen Catholic University, Taiwan[2]
Department of Statistics and Information Science, Fu-Jen Catholic University, Taiwan[3]
**Corresponding Author: 154327@mail.fju.edu.tw*

Received 5 February 2024; received in revised form 3 April 2024; accepted 23 May 2024

Abstract

In 2015, the United Nations established 17 Sustainable Development Goals (SDGs). In response to this global initiative, MEAN WELL Enterprise Co., Ltd. introduced the SDG SHARE+ App in 2022, aiming to expand the sharing economy paradigm. The app integrates Environmental, Social, and Governance (ESG) strategic alliances into its value chain and aspires to function as a platform for sharing SDGs values. To examine the development and implementation of sustainable business models within sharing platforms, this study employs the SDG SHARE+ App as a case study. Utilizing the Unified Theory of Acceptance and Use of Technology (UTAUT) theoretical model, the research analyzes cooperation partners' propensity to adopt the SDG SHARE+ App. The research findings are of managerial significance, offering valuable insights for ongoing optimization initiatives of the SDG SHARE+ App. Simultaneously, these results serve as a strategic blueprint for the extension and integration of the sharing platform model.

Keywords: Sharing economy, system adoption, UTAUT, sustainable development goals

1. Introduction

To address global challenges and create a more sustainable and equal world, the United Nations has set 17 Sustainable Development Goals (SDGs) with 169 targets. These goals guide international and national policies and bridge the gap between human rights and development (COE, 2023; UNStats, 2023). Businesses are increasingly recognizing the importance of sustainable development, with a focus on Environmental, Social, and Governance (ESG) initiatives. Taking action to improve society, the environment, and economic development is more urgent than ever.

In alignment with the ethos of promoting shared values and facilitating integration with the SDGs, MEAN WELL has innovated the SDG SHARE+ Application. This digital platform is envisioned to dispense shared value services to its user base, thereby fostering engagement in a myriad of SDG-aligned activities. Participants are rewarded with SDG points, which are accruals redeemable against various incentives, with each point holding a parity to 1 New Taiwan Dollar. This initiative underscores MEAN WELL's commitment to embedding SDG principles within the SDG SHARE+ App, thereby advancing ESG objectives in collaboration with stakeholders. This encapsulates a concerted dedication towards environmental protection, social responsibility, and corporate governance, facilitated through the communal endeavors underpinned by the SDG SHARE+ App.

The SDG SHARE+ App extends the paradigm of the sharing economy by establishing a platform dedicated to the sharing of SDGs values. In order to foster the integration of sustainability objectives within an organization, employees are required to adhere to sustainable practices, enhance awareness of ESG concerns, provide educational initiatives, and establish performance expectations. This study investigates the adoption of the SDG SHARE+ App through the application of the Unified Theory of Acceptance and Use of Technology (UTAUT) model. The outcomes are intended to enhance the functionality of the application and provide valuable insights for the expansion of the sharing platform model.

2. Literature Review

2.1 Information System Adoption

The success rate of organizations adopting new technologies is below 30%, indicating a disproportionately low return on technology investment (Marikyan & Papagiannidis, 2021). In recent years, research in the field of Human-Computer Interaction (HCI) on User Interface (UI) design has been increasing. While past efforts primarily focused on the usability of computer systems, there is a growing emphasis on understanding how computer systems influence users' information processing through

Cognitive Psychology. This approach aims to create usable computer systems, giving rise to the increasing importance of emotions and happiness engineering in system design. This involves incorporating considerations for User Experience (UX) during system design, incorporating principles from hedonistic psychology into user experience design (Naeini & Mostowfi, 2015).

2.2 Unified Theory of Acceptance and Use of Technology (UTAUT)

Due to the limited explanatory power of the Technology Acceptance Model (TAM), which can only account for 40% of information system usage, the Unified Theory of Acceptance and Use of Technology (UTAUT) emerged (Tamilmani et al., 2021). UTAUT expands the TAM model by integrating various theories on the acceptance of information technology to predict behavioral intentions and usage behavior more effectively, achieving a 70% explanatory power.

These dimensions explore how they impact the Behavioral Intention to use technology and, consequently, the actual Usage Behavior. Among these, Performance Expectancy, Effort Expectancy, and Social Influence directly influence Behavioral Intention, while Behavioral Intention and Facilitating Conditions directly determine Usage Behavior. Additionally, these factors are influenced by gender, age, experience, and voluntariness of use (Venkatesh et al., 2003; Marikyan & Papagiannidis, 2021).

3. Research Model and Hypotheses

The SDG SHARE+ App was launched in 2022 and, as of March 2023, has a user base of more than 800 people. The users are mainly MEAN WELL internal employees and their families, as well as related cooperative companies or dealers. Users can participate in ESG activities, such as events, conferences, and courses, by applying for membership. Members who contribute to ESG activities can accumulate SDG points. SDG points are linked to membership card categories; for example, accumulating 2,000 SDG points upgrades a member from Green to Silver card. Meanwhile, SDG points can be redeemed for gifts, including MEAN WELL peripherals, life technology, charity, green environmental protection, seasonal limited editions, health, and wellness, etc.

The purpose of the SDG SHARE+ App is to create a well-designed user interface where MW WELL partners can collaborate on various value exchanges, establishing a value feedback loop. Through the SDG SHARE+ app, users can participate in various ESG activities and earn SDG points. On the other hand, content providers (organizers of events, conferences or courses) gain exposure through SDG SHARE+ App, attract more user attention, and promote user participation and contribution.

This study uses the UTAUT theoretical model to investigate current members' intentions and use behavior towards the SDG SHARE+ App. The research model is shown in Figure 1.

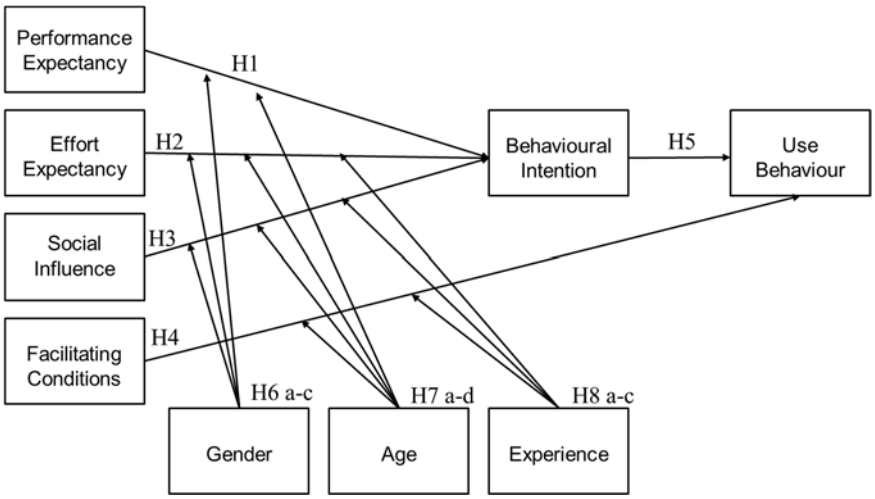

Figure 1: The Research Model

Behavioral intention refers to the subjective probability of an individual taking action and is a key determinant influencing whether an individual engages in a particular behavior. The stronger an individual's intention to perform a specific behavior, the easier it becomes to carry out that behavior. However, it's important to note that intention solely represents the motivation for action. The intensity of this motivation is more reliant on the availability of opportunities and resources to execute the intended action (Ajzen, 1989).

Performance expectation refers to the degree to which users expect the potential effect of the system in providing work performance. Performance expectation is almost the main

factor affecting the intention to use (Venkatesh et al., 2003). Therefore, the following hypotheses are derived:

H1: Performance expectancy positively affects behavioral intention of SDG SHARE+ App

Effort expectancy refers to the level of effort required by an individual when using the system. If an information system has an excellent and user-friendly user interface, it will become an easy-to-operate system, thereby increasing users' willingness to accept it (Venkatesh et al., 2003). Therefore, the following hypothesis is an inference:

H2: Effort expectancy positively affects the behavioral intention of SDG SHARE+ App

Social influence refers to the extent to which individuals believe that people who have important influence on them have subjective norms about using a new system (Venkatesh et al., 2003). Therefore, it is inferred that users' willingness to use information systems will be affected by supervisors or related personnel. influence, so the following hypothesis is put forward:

H3: Social influence positively affects the behavioral intention of SDG SHARE+ App

Facilitation conditions refer to the degree of support provided by individuals for the use of the system by organizational and technology-related equipment, including support for computer software and hardware and assistance with system operation. It also determines the user's intention to use the information system (Venkatesh et al., 2003), therefore the following hypothesis is proposed:

H4: Facilitation conditions positively affects the behavioral intention of SDG SHARE+ App

Behavioral intention is an antecedent factor that affects personal behavior. Therefore, behavioral intention is considered to be the degree to which it affects actual behavior (Gao et al.., 2008). Therefore, the following hypotheses are derived:

H5: The behavioral intention has a positive impact on the use behavior of the SDG SHARE+ App

The strength of the relationships between performance expectancy, effort expectancy, social influence, and behavioral intention all change according to gender, age, and usage experience; in addition, since use behavior changes according to age and usage experience, only when age combines these two factors hour. Only by combining the moderating effect with age and experience can we see the obvious impact of facilitation conditions on use behavior; that is to say, this impact is more significant especially among older users and gradually increases with the accumulation of usage experience (Hsu & Peng, 2022). In summary, using gender, age and usage experience as moderator variables respectively, the following hypotheses are derived:

H6a: User gender has a positive moderating effect on the relationship between performance expectancy and behavioral intention.

H6b: User gender has a positive moderating effect on the relationship between effort expectancy and behavioral intention.

H6c: User gender has a positive moderating effect on the relationship between social influence and behavioral intention.

H7a: User age has a positive moderating effect on the relationship between performance expectancy and behavioral intention.

H7b: User age has a positive moderating effect on the relationship between effort expectancy and behavioral intention.

H7c: User age has a positive moderating effect on the relationship between social influence and behavioral intention.

H7d: User age has a positive moderating effect on the relationship between facilitation conditions and use behavior.

H8a: Usage experience has a positive moderating effect on the relationship between effort expectancy and behavioral intention.

H8b: Usage experience has a positive moderating effect on the relationship between social influence and behavioral intention.

H8c: Usage experience has a positive moderating effect on the relationship between facilitation conditions and use behavior.

4. Data Analysis

4.1 Data Collection

In July 2023, we initiated a month-long online survey. The cohort of respondents consisted predominantly of registered users of the SDG SHARE+ App, a group significantly associated with MEAN WELL Taiwan. This survey targeted a broad spectrum of user categories within the SDG SHARE+ App ecosystem, encompassing employees, executive leadership such as directors and supervisors, various distribution channels and direct clientele, coordination personnel, suppliers, partners engaged in public welfare initiatives, enterprises aligned with ESG principles, and additional entities recognized for their contributions to public welfare and educational endeavors.

The SDG SHARE+ App features two membership account types: company and individual. In the case of individual accounts, donations are associated with the individual, and registration is carried out using an ID number or email. Conversely, contributions to company

accounts are attributed to legal entities. These accounts are registered using an Enterprise Resource Planning (ERP) system code or a unified business number, and the rights and privileges are exercised by the legal entity or a designated representative.

There are a total of 138 valid samples in this study. Sample characteristics are shown in Table 1. The male-to-female ratio among the subjects is about 6:4, and the ages are concentrated between 41-50 years old. Time; Since the SDG SHARE+ App will be launched in 2022, the usage experience is usually 3 months to 1 year, of which personal accounts are the largest, accounting for more than 60%.

Further cross-analyzing the sample characteristics, concerning company accounts, the primary usage experience with the Shared Machine App is within the range of 3 months to 1 year, with a predominant representation of females. The number of individuals with usage experience less than 1 month is minimal, indicating that company accounts are predominantly held by experienced users. Conversely, for individual accounts, the proportion of male users is higher, with the main usage experience falling within the 3 months to 1 year and less than 1-month intervals.

Table 1: Demographic Profile of the Respondents

Item	Category	Frequency	Percentage
Gender	Female	52	37.7
	Male	86	62.3
Age	Under 20	1	0.7
	21~30	8	5.8
	31-40	33	23.9
	41-50	60	43.5
	Over 51	36	26.1
SHARE+ App using experience	Over 1 years	35	25.4
	3 month - 1 year	52	37.7
	1 - 3 month	26	18.8
	Less than 1 month	25	18.1
Membership card	Company account	55	39.9
	Individual account	83	60.1

4.2 Measurement

The measurement model of this questionnaire is also called the external model and has 9 aspects, namely performance expectation (PE), effort expectation (EE), social influence (SI) and facilitating conditions (FC). Behavioral intention (BI), usage behavior (UB) and three moderator variables, namely gender (Gender), age (Age) and usage experience (Experience). A five-point Likert scale ranging from "5" for "strongly agree" to 1 for "strongly disagree" was used to measure performance expectations (PE), effort expectations (EE), social influence (SI) and facility. (FC), behavioral intention (BI) and use behavior (UB).

Members of the SDG SHARE+ App will be assigned distinct membership cards based on their respective contribution levels. The membership card category can serve as a measure of use behavior (UB) to validate the user's actual level of participation. The measurement items and theoretical sources of each questionnaire are shown in Table 2.

Table 2: Measurement Items and Theoretical Sources

Measurement items	Reference
Performance Expectation (PE)	
1. Using SDG SHARE+ App helps me accomplish things more quickly, such as registering meetings, events, and courses.	Venkatesh et al. (2012); Hsu & Tsai (2017)
2. Using SDG SHARE+ App increases my chances of achieving the UN Sustainable Development Goals (SDGs).	
3. Using SDG SHARE+ App increases my productivity	
4. Overall, SDG SHARE+ App is useful to me.	
Effort Expectation (EE)	
1. Learning how to use SDG SHARE+ App is easy for me.	Venkatesh et al. (2012); Hsu & Tsai (2017)
2. My interaction with SDG SHARE+ App is clear and understandable.	
3. Overall, SHARE+ App is easy to use to me.	
Social Influence (SI)	
1. Many of my friends or colleagues are using SDG SHARE+ App.	Venkatesh et al. (2003); Hsu & Tsai (2017)
2. My supervisor is very supportive of the use of SDG SHARE+ App.	
3. People who influence my behavior think that I should use SDG SHARE+ App.	
4. Overall, the organization has supported the use of the SDG SHARE+ App.	

Measurement items	Reference
Facilitating Conditions (FC)	
1. I have the resources necessary to use SHARE+ App.	Venkatesh et al. (2003);
2. SDG SHARE+ App is compatible with all aspects of my work	Hsu & Tsai (2017)
3. I can complete redeem SDG points on SHARE+ App without paying a lot of efforts	
Behavioral Intention (BI)	
1. I intend to continue using SHARE+ App in the future.	Venkatesh et al. (2012);
2. I will always try to participate in daily activities such as meetings, events, or courses through SDG SHARE+ App.	Hsu & Tsai (2017)
3. I plan to continue to use SDG SHARE+ App frequently	
Use Behavior (UB)	
What is your membership card?	This study
1. None	
2. Green Card	
3. Silver Card	
4. Golden Card	
5. Platinum Card	
6. Diamond Card	

4.3 Model Identification

This study applies the Partial Least Squares (PLS) method in SmartPLS 4 to examine the measurement scale of users' intention to use the SDG SHARE+ App and to test the research hypotheses. The assessment of the measurement model encompassed evaluations of reliability, convergent validity, and discriminant validity. All Cronbach's α values exceeded 0.7, and the composite reliability (CR) ranged from 0.812 to 0.958, surpassing the acceptable threshold of 0.7. This demonstrates a high level of internal consistency for the constructs (Nunnally, 1978). Additionally, the average variation extracted (AVE) values are all above 0.5, with the minimum value being 0.671, showing that latent variables are largely explained by changes in their measured variable (Fornell & Larcker, 1981), as depicted in Table 3.

Table 3: Reliability a Convergent Validity Analysis

Construct	Cronbach Alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	AVE
FC	0.761	0.812	0.858	0.671
EE	0.929	0.931	0.955	0.875
SI	0.875	0.887	0.914	0.727
PE	0.932	0.935	0.952	0.831
BI	0.934	0.937	0.958	0.884

To ensure adequate discriminant validity, the square root of the average variation (AVE) extracted from each construct must exceed the correlations shared between that construct and other constructs in the model. Table 4 lists the correlations between constructs, with the square root of the AVE value on the diagonal. Notably, the diagonal values exceeded the inter-construct correlations, confirming the acceptability of the discriminant validity test. At the same time, the factor loading test values are all greater than 0.7, indicating that the construct validity is ideal. Therefore, we can assert that the measures of each construct meet the criteria for construct validity.

Table 4: Discriminant Validity Analysis

Construct	FC	EE	SI	PE	BI
FC	0.819				
EE	0.723	0.936			
SI	0.76	0.669	0.853		
PE	0.646	0.682	0.715	0.912	
BI	0.688	0.682	0.786	0.814	0.94

4.4 Model Evaluation

This study uses the partial least squares method (PLS) to analyze the hypothesized model. PLS is beneficial for modeling latent structures under non-normal conditions and is particularly suitable for modeling small to medium-sized samples using component-based estimation methods (Chin, 1998). PLS is considered to be more suitable for testing moderating effects than covariance-based estimates (Chin & Newsted, 1999). Therefore, PLS imposes minimal restrictions on normality, scaling, sample size, and testing of moderating effects.

In this study, we utilized the PLS method and used SmartPLS software for data analysis.

PLS-SEM has no specific statistical assumptions about the distribution of latent variables, so the sample distribution is unknown. In order to test the significance of parameter estimates, PLS-SEM mainly relies on bootstrapping to obtain the sampling allocation standard error (Chin, 1998). This study uses a random sample of 5,000 for estimation. The standardized root mean square residual (SRMR) of this study was less than 0.08, indicating good fitness.

The test of the hypothesis of this study is shown in Figure 2. The strength of the causal relationship between various aspects is expressed through the value of the path coefficient. Path coefficients provide information about the strength and direction between variables. The R^2 value is the amount of explanation of endogenous variables by exogenous variables, and also represents the predictive ability of the study. The path coefficient and R^2 value jointly represent the degree of fit between the structural model and the observation data. As can be seen from Figure 2, the explanatory power of performance expectancy (PE), social influence (SI) and facilitating conditions (FC) on behavioral intention (BI) is 77.4%. The model was shown to explain the latent variables well, with behavioral intention (BI) explaining 24% of use behavior (UB).

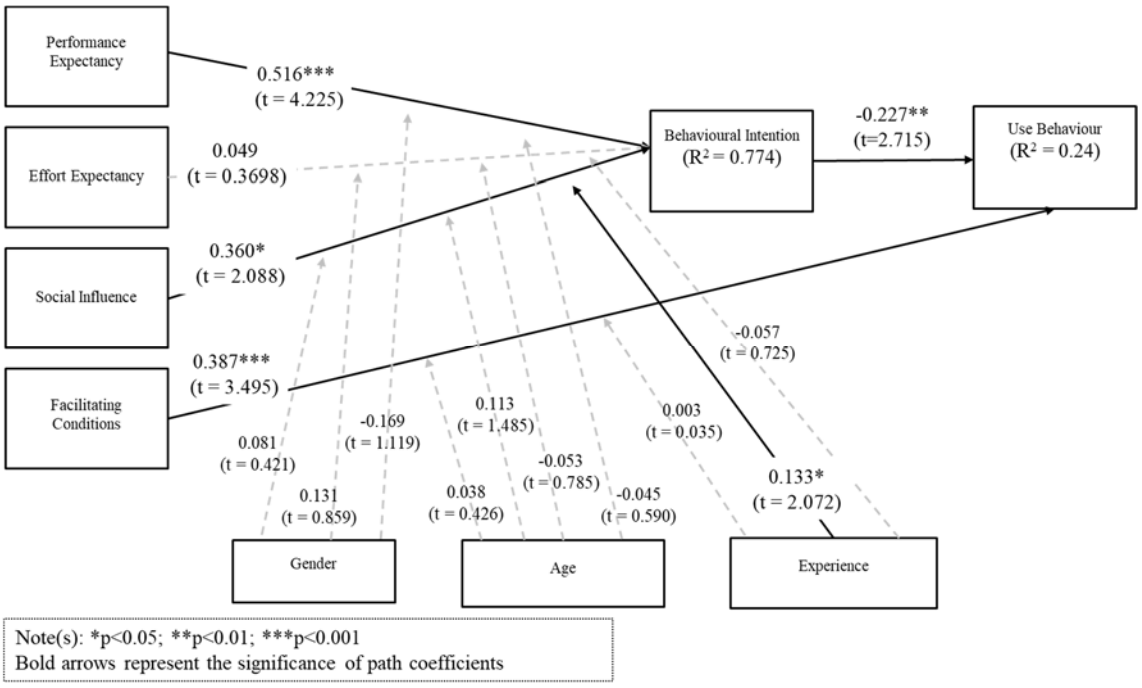

Figure 2: Modeling Results

5. Discussion

According to the research findings, it was observed that Effort Expectancy (EE) does not have a significant impact on Behavioral Intention (BI). This suggests that the overall operation of the SDG SHARE+ App is relatively simple, and thus does not influence users' intention to use. Gender, age, and experience do not exhibit consistent moderating effects, except that experience positively moderates the relationship between Social Influence (SI) and Behavioral Intention (BI). This indicates that the use of the SDG SHARE+ App is applicable to everyone, regardless of gender or age. As experience accumulates, it creates a social influence within the organization, affecting individual perceptions of subjective norms and subsequently enhancing the usage intention among organizational members. Since the SDG SHARE+ App was newly launched in 2022, with early users guiding the way, it can be anticipated that more users will be drawn to its usage due to the social influence in the future.

It is worth noting that, despite the significant impact of Behavioral Intention (BI) on Use Behavior (UB), the effect is negative. This implies that although users have a high behavioral intention, it does not necessarily translate into increased actual usage. Further analysis of the correspondence between membership levels and reveals, that users without membership cards constitute the majority, mostly associated with individual accounts. This suggests that while most users express an intention to use, their actual contribution level is not high, and they are unable to progress to become card-carrying members. It is inferred that the threshold for upgrading to membership status may be high, or the motivating factors may not

be sufficient. Further analysis of point incentives and membership card approval mechanisms is needed to enable users willing to use the SDG SHARE+ App to make more meaningful contributions and become MEAN WELL partner members, fostering long-term collaboration towards the shared vision of value creation.

6. Conclusion

In summary, confronting global challenges and fostering a sustainable, equitable world necessitates a concerted effort from corporations, particularly through the lens of ESG initiatives. The adoption of sustainable practices within a company is paramount, necessitating a comprehensive approach that includes enhancing awareness of ESG matters, educating employees on sustainability issues, and setting clear performance benchmarks. MEAN WELL's development of the SDG SHARE+ App exemplifies an innovative approach to integrating these sustainable development goals, aiming to broaden the sharing economy's scope into a platform dedicated to the shared values of the SDGs.

The analysis delves into the strategic approaches and capabilities inherent in the SDG SHARE+ application to support the achievement of sustainability goals through corporate and individual engagement. It highlights the innovative features of the SDG SHARE+ App, promoting user engagement in sustainability efforts, a reward system that promotes continued engagement, and the integration of the SDG SHARE+ App into broader corporate sustainability.

The results of this study are expected to provide a comprehensive understanding of the factors that contribute to the effectiveness of digital platforms, such as the SDG SHARE+ app, in advancing the sustainable development goals and provide practical recommendations for overcoming system adoption challenges.

References

Ajzen, I. (1985). From Intentions to Actions: A Theory of Planned Behavior. In: Kuhl, J., Beckmann, J. (Eds), Action Control (pp. 11-39). Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-69746-3_2

Chin, W. W., & Newsted, P. R. (1999). Structural Equation Modeling Analysis with Small Samples Using Partial Least Squares. *Statistical Strategies for Small Sample Research*, *1*(1), 307-341.

Chin, W.W. (1998). *The Partial Least Squares Approach for Structural Equation Modeling in Modern Methods for Business Research*. Mahwah, NJ: Lawrence Erlbaum.

COE (2023). UN Agenda 2030, Council of Europe. Retrieved from https://www.coe.int/en/web/programmes/un-2030-agenda

Gao, Z., Xiang, P., Lee, A. M., & Harrison Jr, L. (2008). Self-efficacy and outcome expectancy in beginning weight training class: Their relations to students' behavioral intention and actual behavior. *Research Quarterly for Exercise and Sport*, *79*(1), 92-100.

Hsu, C. W., & Peng, C. C. (2022). What drives older adults' use of mobile registration apps in Taiwan? An investigation using the extended UTAUT model. *Informatics for Health and Social Care*, *47*(3), 258-273.

Marikyan, D. & Papagiannidis, S. (2021). Unified Theory of Acceptance and Use of Technology: A review. In S. Papagiannidis (Ed), *TheoryHub Book*. Retrieved April 13, 2023, from https://open.ncl.ac.uk/theory-library/unified-theory-of-acceptance-and-use-of-technology.pdf

Marinen, M. (2012). Book Review — Resilient People, Resilient Planet: A Future Worth Choosing. *Promoting Leadership in Thought that Leads to Action (Cadmus)*, 1(5), 109-114. Retrieved from http://www.cadmusjournal.org/article/issue-5/book-review-%E2%80%94-resilient-people-resilient-planet-future-worth-choosing

Naeini, H.S. & Mostowfi, S. (2015). Using QUIS as a Measurement Tool for User Satisfaction Evaluation (Case Study: Vending Machine). *International Journal of Information Science*, *5*(1), 14-23.

Nunnally, J. C. (1978). *Psychometric Theory*. NY: McGraw-Hill.

Tamilmani, K., Rana, N. P., Wamba, S. F., & Dwivedi, R. (2021). The extended Unified Theory of Acceptance and Use of Technology (UTAUT2): A systematic literature review and theory evaluation. *International Journal of Information Management*, *57*, 102269.

UNStats (2023). SDG Indicators. Retrieved from https://unstats.un.org/sdgs/

Vogeistein, F. (2013). *Dogfight: How Apple and Google Went to War and Started a Revolution*. New York, NY: Sarah Crichton Books.

About Authors

Hsien-Cheng Wang is the Sustainability Director at MEAN WELL Group, responsible for sustainable management, strategy development, and operational performance. He drives the implementation of Sustainable Development

Goals (SDGs) and actively supports CSR and Public Welfare Foundation initiatives.

Ya-Wen Lin is assistant professor in the department of Information Management at Fu Jen Catholic University in Taiwan. Her research interests include network economy, project management and geoinformatics.

Chien-Hsiang Liao is professor at the department of information management, Fu Jen Catholic University, Taiwan. His research focuses on the e-services, informetrics, information system, social capital, and social network.

Qing-Feng Lin is assistant professor in the department of Information Management at Fu Jen Catholic University in Taiwan. His research interests include sentimental analysis, machine learning and project management.

Shan-Ling Weng is an undergraduate student in the department of Statistics and Information Science at Fu Jen Catholic University in Taiwan. Her research interests include data analysis and speech recognition.

Shih-Wei Shen is a master's student in the Information Management Department of Fu Jen Catholic University in Taiwan. His research interests include data mining, machine learning and deep learning.