An Exploratory Factor Analysis for Consumer Traits among Malaysian e-Service Users

Fahmi Zaidi Abdul Razak¹ Azlina Abu Bakar² and Wan Salihin Wong Abdullah³

¹Faculty of Education and Social Science, Widad University College, BIM Point, Bandar Indera Mahkota, 25200 Kuantan, Pahang
²Faculty of Human Development, University Pendidikan Sultan Idris
³Quality Assurance and Accreditation Centre, University Malaysia Kelantan

Abstract. Nowadays, many countries are working to implement e-government in their country. This requires substantial investments and, if the consumers do not make use of them, the investment would be considered a failure. Many previous researches have looked at the validity of consumer traits dimension as well as its role in predicting technology adoption. This research seeks to explore the validity of the dimension of consumer traits in the Malaysian context. Using a structured questionnaire derived from the literature, data was collected from 543 e-service users in both public and private institutions in Malaysia. Data was analyzed using exploratory factor analysis (EFA). The results indicate that the consumer traits were valid with three factor model.

1 Introduction
The need to improve efficiency in management, business and learning requires assistance from information technology. However, the initiatives of e-government will not be fully success if it is not received by the end users. The usage of e-government oftenly hinder by consumer traits of the users. Several scholars have argued that technological anxiety, need for interaction and technological innovation are variables of consumer traits that can predict the adoption of technology. However, few studies have identified the validity of technology anxiety, the need for interaction and technology innovation, but none have been conducted in Malaysia. Therefore, the main objective of this investigation is to assess the validity of these constructs in terms of their convergent and discriminant validity.

2 Literature review

2.1 E-government in Malaysia
What is E-Government? E-government is short for electronic government. E-government also known as e-gov, Internet Government, Digital Government, Online Government, and Connected Government. G2G (Government to Government), G2C (Government to Citizen), G2E, (Government to Employees), G2B (Government to Business). E-Government is the use of information and communication technologies (ICTs) to improve the activities of public sector organizations. The Malaysia's Electronic Government initiative began in 1997 with the launch of Multimedia Super Corridor's (MSC) E-Government Flagship Application to lead the country into the Information Age. There are ten projects of e-Government in
Malaysia. Project Monitoring System (SSP II). It is an online system that tracks national program life cycles, for example from project requests to approvals, mid-term analysis and completion.

2.2 Consumer traits
A number of studies have examined the role of consumer traits in predicting technology adoption. In the extended Theory of Planned Behavior, Yang [1] seeks to examine the relationship between consumer traits determinants and mobile shopping adoption. Lee, Jeong Cho, Xu, & Fairhurst [2] revealed that technology anxiety, the need for interaction and technology innovationesss has significant influence on retail self-service checkouts usage. While Bruner & Kumar [3] explores the new concept of the technology-related type of consumer called gadget lover. According to Bruner & Kumar [3], Gadget lover is defined as a highly motivated customer who adopts and uses a number of state of the art technological products including complementary services.

3 Methodology
The research sample consisted of 543 e-service users in both public and private institutions. Data from the study were collected using a non-probability sampling method. Measures for the model were adapted from existing scales from previous relevant studies using a 5-point Likert scale anchored by 1 = strongly disagree and 5 = strongly agree

| Constructs                        | Source |
|-----------------------------------|--------|
| technology anxiety,               | [4]    |
| the need for interaction          | [5]    |
| technology innovationesss         | [3]    |

4 Data analysis

4.1 Demographic variable
The overall sample for e-service users is 114 and 77.2 percent of respondents were Malay and 21.1 percent were Chinese and 1.8 percent were Indian. 30 were male 26.3 were female. Majority of them (43%) had 12 years and above and 4 to 7 years of internet experience and the rest 1 to 3 years are 7% and 8 to 11 years are 17.5%

![Figure 1. Demographic](image-url)
4.2 Exploratory factor analysis

If researchers are interested in the validity of the factor structure, the use of exploratory factor analysis (EFA) technique is necessary. The use of the EFA was initiated by Pearson [6] and Spearman [7]. EFA’s purpose is to reduce a large number of variables into a smaller set of variables [8]. The present study employs EFA to identify the factor structure of consumer traits among Malaysian e-service users. Data showed strong correlation between the extracted factors based on the Varimax rotation method. The Kaiser–Meyer–Olkin measure indicates the good suitability of the sample size for the factor analysis, KMO = 0.766 and The Bartlett’s test of sphericity is significantly large ($\chi^2(78) = 1026.093, p < 0.05$). The analysis showed the existence of three components with an eigenvalue of more than 1 explaining 75% of the variance (Table 1). The following factors are determined by interpreting the variables clustered in the rotating component matrix (Table 2)

- **First component.** Technology anxiety. defined as a fear and apprehension about using all forms of technology [4]
- **Second Component.** Need for interaction is the extent to which consumers importantly perceive human interaction in service delivery [5]
- **Third Component.** Technology innovativeness. refers to consumers’ motivation of being the first to adopt new technology-based goods and services [3]
Table 2: Exploratory data analysis

| Component | Initial Eigenvalues | Extraction Sums of Squared Loadings | Rotation Sums of Squared Loadings |
|-----------|---------------------|-------------------------------------|----------------------------------|
|           | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1         | 4.605 | 35.425        | 35.425       | 4.605 | 35.425        | 35.425       | 4.111 | 31.625        | 31.625        |
| 2         | 2.948 | 22.679        | 58.104       | 2.948 | 22.679        | 58.104       | 3.273 | 25.178        | 56.803        |
| 3         | 2.199 | 16.914        | 75.018       | 2.199 | 16.914        | 75.018       | 2.368 | 18.215        | 75.018        |
| 4         | .643  | 4.949         | 79.968       |        |               |              |        |               |              |
| 5         | .526  | 4.048         | 84.016       |        |               |              |        |               |              |
| 6         | .476  | 3.658         | 87.674       |        |               |              |        |               |              |
| 7         | .370  | 2.844         | 90.518       |        |               |              |        |               |              |
| 8         | .317  | 2.436         | 92.954       |        |               |              |        |               |              |
| 9         | .278  | 2.135         | 95.089       |        |               |              |        |               |              |
| 10        | .252  | 1.939         | 97.028       |        |               |              |        |               |              |
| 11        | .182  | 1.403         | 98.431       |        |               |              |        |               |              |
| 12        | .114  | .876          | 99.307       |        |               |              |        |               |              |
| 13        | .090  | .693          | 100.000      |        |               |              |        |               |              |

Extraction Method: Principal Component Analysis.

Table 3: Rotated component

| Contract               | Indicators | Component 1 | Component 2 | Component 3 |
|------------------------|------------|-------------|-------------|-------------|
| Technology anxiety     | Anxie6     | .885        |             |             |
|                        | Anxie5     | .857        |             |             |
|                        | Anxie4     | .840        |             |             |
|                        | Anxie3     | .829        |             |             |
|                        | Anxie1     | .780        |             |             |
|                        | Anxie2     | .734        |             |             |
|                        | Inno2      |             | .921        |             |
| Technology innovativeness | Inno3 |             | .916        |             |
|                        | Inno4      |             | .882        |             |
|                        | Inno1      |             | .860        |             |
| Need for interaction  | Interact2  |             |             | .879        |
|                        | Interact3  |             |             | .860        |
|                        | Interact1  |             |             | .836        |
5 Discussion
An initial objective of the study was to assess the validity of technological anxiety, need for interaction, and technological innovativeness. An EFA was conducted to achieve the study goal. Empirically, data showed that consumer traits has been validated with three sub-components that are technological anxiety, need for interaction, and technological innovativeness. This finding was supported by Lee et al. (2010) who first validated the constructs from the self-service checkout usage perspective. The result of the EFA shows that the whole item falls precisely within the intended factor structure and has exceptional loadings. The most surprising outcome of the data is that none of the item was deleted due to a low factor loading indicating sufficient numbers of data as well as strong theoretical foundation. No study was carried out in Malaysia to test the validity of the consumer traits dimension in Malaysia. Our findings shed light on the applicability of consumer traits dimension in Malaysian context.

6 Conclusion
Our research is the first to assess the validity of the consumer traits dimension among Malaysian e-government users. Given the importance of technology acceptance research, it is crucial to implement valid and reliable tools to measure the dimension. The consumer traits dimension resulted in a three-factor model with good construct validity. The most important limitation lies in the fact that this study on focuses on the validity aspect. Thus, future investigations, might be possible to use consumer traits dimension in full conceptual model as a predictor for any kind of technology adoption. Finally, the consumer traits dimension may continue to serve as a research tool to measure technology adoption among other context in Malaysia.

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