IJBARR
E- ISSN -2347-856X
ISSN -2348-0653

# USE OF TECHNOLOGY MODEL FOR E-AGRICULTURE SERVICES

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***Abstract***

*The role of the information technology sector has permeated every element of human life in the current era of information technology. In places where ICT development has modernised traditional agriculture. In order to identify the gaps and current state of the art in research, this study will examine and analyse the trend of information technology in e-agriculture. In this study used a sample of 385 farmers from Tirunelveli District with the use of SPSS 20 software and AMOS 20, the researcher used reliability test, Exploratory Factor Analysis, Confirmatory Factor Analysis. Twenty statements are divided into five factors. There are Performance Expectancy, Behavioural Intention, Effort Expectancy, Social Influence and Facilitating Conditions. Farmers have many technology in practices. The experts are teaching it to the farmers but there is a delay in their implementation. It has been suggested that the experts should focus on teaching and implementation.*

**Key Words: Traditional, Information, Performance, Behavioural, Effort, Implementation.**

## Introduction

Technology use has increased as a result of farmer demand. New technology have long been a target for farmers looking to save expenses. Additionally, customers are demanding low cost, high quality food that is being produced using organic methods in many nations, with more variety, consistency, and year-round availability. This is due to rising incomes, improved knowledge, and better communication channels. The desire from customers for their food to be produced using methods that limit environmental constraints, conserve natural resources, and give more consideration to rural practicality and animal welfare is growing at the same time. The sources of supply and the level of competition are expanding as a result of trade liberalisation (Radhika Kapur 2018). **Erick Fernando et al., (2016)** analysis showing that e-commerce is the trend in agricultural information technology. According to a well-known study by experts, successful e-commerce in agriculture is necessary for having an impact on farmers' income. Additionally, studying the sensor sector that aids an agricultural operation to boost output from such a farm. Information technology advancements have made agriculture more contemporary. **Abdul Rehman et al., (2016)** the most current tractors and implements can be more exact and less wasteful in their use of fuel, fertiliser, or seed thanks to GPS locators, computer monitoring systems, and self-steer programmes. current technology is changing the way that humans run the equipment. Future agricultural equipment that uses GPS and electronic sensors, such as driverless tractors, may be mass produced.

**Table 1-KMO and Bartlett's Test & Cronbach's Alpha**

| | | |
|---|---|---|
| **Cronbach's Alpha** | | **.874** |
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | **.885** |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 4247.484 |
| | Df | 190 |
| | Sig. | .000 |
| No. of Items | | 20 |

Source: Derived

As per Kaiser-Meyer-Olkin test, the sampling adequacy is .885 which is above .5 with the chi square value of 4247.484 and is statistically significant as the p value is .000 which is below 0.05 and Cronbach's Alpha is 0.874 which is the good measure of reliability.

**Table 2-Rotated Component Matrix**

| Components | Performance Expectancy | Behavioural Intention | Effort Expectancy | Social Influence | Facilitating Conditions |
|---|---|---|---|---|---|
| E-agriculture helps to increase agricultural production | **.833** | .177 | .088 | .170 | .095 |
| The actual process of using e-Agriculture is pleasant | .813 | .205 | .065 | .222 | .072 |
| Timely information is available from e-agriculture service | **.806** | .228 | .062 | .209 | .078 |
| E-agriculture service is useful by providing information related to agriculture | **.784** | .230 | .085 | .133 | .076 |
| Get more information about e-agriculture service | .186 | **.836** | .117 | .208 | .053 |
| It costs a lot to use e-Agriculture | .243 | **.818** | .142 | .163 | .101 |
| E-agriculture service will continue to be used in the future | .175 | **.811** | .134 | .156 | .089 |
| E-agriculture service can be used if assistance facility has been developed for assistance. | .234 | **.777** | .117 | .095 | .047 |
| Interacting with an e-agriculture service does not require much mental effort. | .050 | .122 | **.866** | .090 | -.026 |
| E-agriculture is easy to use and flexible | .056 | .118 | **.859** | .012 | .041 |
| Learning to use e-agriculture is easy. | .061 | .107 | **.851** | .039 | -.001 |
| A specified individual (or group) is available in case of difficulty | .107 | .102 | **.846** | .134 | .023 |
| In general, the community encourages using e-Agriculture and sharing the information as much as can. | .025 | .039 | .024 | **.820** | .038 |
| People at e-agriculture service are reliable | .293 | .260 | .109 | **.777** | .078 |
| Friends (non-relatives) influence own decision to use e-agriculture services | .352 | .148 | .064 | **.736** | .070 |
| Relatives influence the decision to use e-agriculture services. | .276 | .362 | .171 | **.732** | .085 |
| Resources are available to use the e-agriculture service. | .002 | .020 | .013 | .119 | **.799** |
| Sufficient electricity and mobile network is available to use e- Agriculture service. | .066 | .068 | .050 | .031 | **.778** |
| Knowledge required using e-agriculture service. | .146 | .044 | -.046 | -.003 | **.774** |
| No assistance is required to use the e-agriculture service. | .046 | .097 | .015 | .047 | **.768** |
| Eigenvalues | 6.65 | 2.69 | 2.19 | 1.53 | 1.38 |
| % of Variance | 33.23 | 13.45 | 10.97 | 7.66 | 6.92 |

Source: Derived

The first factor is performance expectancy consists of four statements namely, E-agriculture helps to increase agricultural production (.833), the actual process of using e-Agriculture is pleasant (.813), timely information is available from e-agriculture service (.806), e-agriculture service is useful by providing information related to agriculture (.784). The second factor is behavioural intention consists of four statements namely, Get more information about e-agriculture service (.836),it costs a lot to use e-Agriculture (.818),e-agriculture service will continue to be used in the future (.811), e-agriculture service can be used if assistance facility has been developed for assistance. (.777). Third factor consists of four statements namely, interacting with an e-agriculture service does not require much mental effort (.866),e-agriculture is easy to use and flexible (.859),learning to use e-agriculture is easy (.851),a specified individual (or group) is available in case of difficulty (.846). Forth factor consists of four statement namely, in general, the community encourages using e-agriculture and sharing the information as much as can (.820),people at e-agriculture service are reliable (.777),friends (non-relatives) influence own decision to use e-agriculture services (.736),relatives influence the decision to use e-agriculture services (.732). The fifth factor consists of four statement namely, resources are available to use the e-agriculture service (.799),sufficient electricity and mobile network is available to use e- agriculture service (.778),knowledge required using e-agriculture service (.774),no assistance is required to use the e-agriculture service (.768).

**Table 3- Goodness of fit for test of Model**

| Indices | Value | Suggested Value | Interpretation |
|---|---|---|---|
| Chi-square value/DF | 1.347 | < 5.00 ( Hair et al., 1998) | Excellent |
| GFI | .949 | > 0.90 (Hu and Bentler, 1999) | Excellent |
| AGFI | .933 | > 0.90 ( Hair et al. 2006) | Excellent |
| NFI | .950 | > 0.90 (Hu and Bentler, 1999) | Excellent |
| CFI | .987 | > 0.90 (Daire et al., 2008) | Excellent |
| RMR | .049 | < 0.08 ( Hair et al. 2006) | Acceptable |
| RMSEA | .030 | < 0.08 ( Hair et al. 2006) | Acceptable |

Source: Derived

From the above table it is found that the value of CMIN/DF is 1.311 which is less than 5.00 which indicates perfectly fit. Here, Goodness of Fit Index (GFI) value (0.949) and Adjusted Goodness of Fit Index (AGFI) value (0.933) is greater than 0.9 which represent it is a good fit. The calculated Normed Fit Index (NFI) value (0.950) and Comparative Fit Index (CFI) value (0.987) indicates that it is a perfectly fit and also it is found that Root Mean square Residuals (RMR) value 0.049 and Root Mean Square Error of Approximation (RMSEA) value is 0.030 which is less that 0.08 which indicated it is perfectly fit.

**CFA Model with Standardized factor Loading**

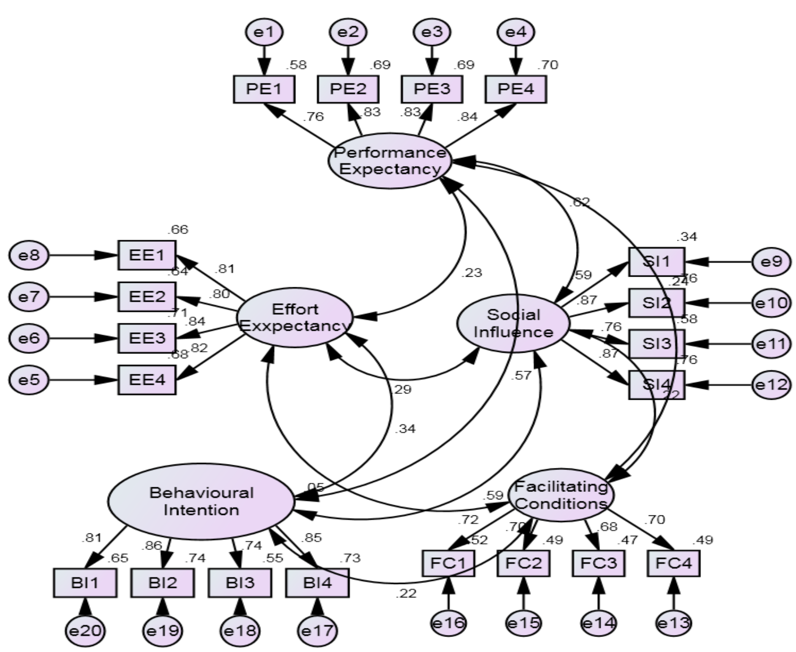

**Table 4- Calculation of Average Variance Extracted (AVE) and Construct Reliability (CR)**

| | | | Factor Loading (FL) | Item Reliability (IR) | Delta | AVE | Sum of FL | Sum of Delta | CR |
|---|---|---|---|---|---|---|---|---|---|
| PE1 | <--- | PE | 0.763 | 0.582 | 0.418 | 0.666 | 3.262 | 1.336 | 0.888 |
| PE2 | <--- | PE | 0.829 | 0.687 | 0.313 | | | | |
| PE3 | <--- | PE | 0.834 | 0.696 | 0.304 | | | | |
| PE4 | <--- | PE | 0.836 | 0.699 | 0.301 | | | | |
| EE8 | <--- | EE | 0.822 | 0.676 | 0.324 | 0.673 | 3.28 | 1.310 | 0.891 |
| EE3 | <--- | EE | 0.842 | 0.709 | 0.291 | | | | |
| EE2 | <--- | EE | 0.802 | 0.643 | 0.357 | | | | |
| EE1 | <--- | EE | 0.814 | 0.663 | 0.337 | | | | |
| SI1 | <--- | SI | 0.586 | 0.343 | 0.657 | 0.612 | 3.095 | 1.550 | 0.861 |
| SI2 | <--- | SI | 0.87 | 0.757 | 0.243 | | | | |
| SI3 | <--- | SI | 0.764 | 0.584 | 0.416 | | | | |
| SI4 | <--- | SI | 0.875 | 0.766 | 0.234 | | | | |
| FC4 | <--- | FC | 0.697 | 0.486 | 0.514 | 0.492 | 2.804 | 2.034 | 0.794 |
| FC3 | <--- | FC | 0.684 | 0.468 | 0.532 | | | | |
| FC2 | <--- | FC | 0.701 | 0.491 | 0.509 | | | | |
| FC1 | <--- | FC | 0.722 | 0.521 | 0.479 | | | | |
| BI4 | <--- | BI | 0.855 | 0.731 | 0.269 | 0.670 | 3.268 | 1.321 | 0.890 |
| BI3 | <--- | BI | 0.744 | 0.554 | 0.446 | | | | |
| BI2 | <--- | BI | 0.861 | 0.741 | 0.259 | | | | |
| BI1 | <--- | BI | 0.808 | 0.653 | 0.347 | | | | |

Source: Calculated

The Construct Reliability is the method for assessing the contribution or significance of an item by examining the factors loading. The Construct Reliability (CR) of the five latent constructs is greater than 0.70 which indicate good reliability and the value for Average Variance Extracted (AVE) is also greater than 0.5 which indicate adequate convergent Validity. High construct reliability indicates that internal consistency exists. The data has good Construct Reliability and Convergent Validity.

## Conclusion

In performance expectation e-agriculture helps to increase agricultural production, in behavioural intention to get more information about e-agriculture service, effort expectation uptake with e-agriculture service does not require much mental effort, community influence community encourages the use of e.agriculture and share information as much as possible, facilitating condition Resources are available to use the e-agriculture service. It is clear from the above information that the farmers have understood the agricultural technology. However, the reasons why the farmers do not implement the modern technology are that modern farming methods require more capital, cannot face high losses, overuse of natural resources, use of more fertilizers, loss of soil fertility, Leads to water depletion due to use of groundwater for tube well irrigation. It was suggested that a number of farmers can pool together to reduce capital, Planting two or more crops on the same plot of land in a year, instead of just one crop, can limit losses, Low use of modern fertilizers that affect soil fertility and Less chemicals and biological pest control and incorporating natural fertilizers can help loss of soil fertilizer.

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