

**Adoption and use of Web 2.0 technologies:
a comparison of four adoption models as a case study
of a state government eExtension project**

by

David John James
BHortSc, DipHortSc (Massey), MAgrSt (UQ)

A thesis submitted to the
Faculty of Business, Education, Law and Arts
University of Southern Queensland
in fulfilment of the requirements for the degree of

Doctor of Philosophy

2015

Abstract

The adoption and use of three Web 2.0 technologies (web conferencing, eSurveys, and YouTube videos) were studied using the following four adoption models: the Diffusion of Innovations, the Unified Theory of Acceptance and Use of Technology, the Adoption and Diffusion Outcome Prediction Tool (ADOPT), and Switch: How to change things when change is hard. It is believed that this research study comparing four quite divergent models is the first of its kind attempted, and similarly its focus on the adoption of Web 2.0 technologies.

The study was conducted within an organisational context of a state government agriculture department. Unlike previous studies which focused on individuals in an organisational setting with attitude factors such as perceived use, this study considered the actual usage of the technologies by government staff.

A case study approach with mixed methods consisting of quantitative and qualitative techniques utilised the results from six data sets – five surveys and one set of observational data – all collected as part of the Queensland Government's eExtension project. Staff actively using the eTechnologies were surveyed for the eExtension project baseline survey (n=119), the Impact of web conferencing survey (n=56), the Impact of eSurveys survey (n=47), the YouTube video training workshop survey (n=39) and finally, the Motivation to adopt an innovation survey (n=94). In that final survey, organisational users of the Web 2.0 technologies selected one of the three technologies – eSurveys, webinars, or YouTube videos – and rated their degree of use of the technology, nominated the factors that encouraged and discouraged adoption of the technology, and then responded to questions from the four adoption models.

The quantitative data was analysed using R (including ANOVA, Principal Components Analysis and Hierarchical Cluster Analysis) and the qualitative data was analysed using content analysis (predominantly undertaken manually but also electronically using Leximancer and Wordle).

While it was not possible to determine whether one of the four models was any more effective than the others at predicting adoption, the Hierarchical Cluster Analysis confirmed that the Diffusion of Innovations and ADOPT models were robust with minimal overlapping questions within them.

Unlike any previous study reviewed, an analysis was undertaken to determine whether there was a difference between human or technology related questions. An analysis across all the questions indicated that questions categorised as relating to technological factors were slightly better at predicting adoption than those categorised as human factors.

This study also identified the factors that encouraged the adoption and use of new technologies, which for eSurveys were the increased efficiency of creating, distributing and analysing surveys; the ease of use for the survey creator and respondent; saving time and money; accessibility of reaching people; and the ease of distribution. These factors for webinars were that they provided more opportunities

to interact; reduced travel and were cost effective; provided visual aids in seeing each other and documents, were easy to use or to get support and assistance. The factors that encouraged adoption of YouTube style videos were their use as a visual tool for training and/or conveying information; lower costs associated with making video as opposed to other options; greater acceptance and/or demand by the target audience; and having received training to make the videos. The overall themes that emerged regarding the factors that encouraged adoption of the new technologies were that they needed to be easy to use, save time and money, and they required the provision of support.

The research study also identified the factors that discouraged adoption of the new technologies. For eSurveys these were learning how to use the technology and the lack of acceptance of the technology by end-users. For webinars they were the lack of training for organisers and/or participants; lack of Departmental support; potential participants not accepting the technology and/or not having access to equipment; the preference for face-to-face interaction and the cost. Finally, for YouTube the factors were lack of training, lack of Departmental support, lack of access to equipment, and lack of time. The overall themes that emerged regarding the factors that discouraged adoption of the new technologies were lack of training on how to use the new technology, end-users not being receptive to it, lack of departmental support and/or policy, and lack of access to equipment.

The benefits derived from the use of these modern technologies were also identified, and for web conferencing these were saving travel time, saving travel money, better engaging with clients and/or colleagues, being more innovative and being more responsive to the needs of clients and/or colleagues. The benefits derived from the use of eSurveys were being more efficient by saving time and effort when gathering feedback from clients, being more responsive to the needs of clients, being more innovative, making better informed decisions, and more efficiently gathering feedback after an event. The main benefit derived from YouTube videos was an efficient means of communication without the use of paper.

A new model for the adoption and use of Web 2.0 technologies, the User benefits model, was developed for an organisational setting. It comprises four factors related to user benefits: contagious benefits, supporting benefits, working smarter benefits and noticeable, triable benefits.

Certification of Thesis

This is to certify that the ideas, experimental work, results, analysis, conclusion, and recommendations reported in this dissertation are entirely of my own effort, except where otherwise acknowledged. I also certify that the work is original and has not been previously submitted for any other award, except where otherwise acknowledged.

Signature of candidate

John James

Date

Endorsement

Signature of supervisors

Professor Raj Gururajan
(Principal supervisor)

Date

Dr Jeff Coutts
(Associate supervisor)

Date

Acknowledgments

In the time-old children's book, *Through the looking glass*, Carroll (1871, p. 64) writes:

“The time has come,” the Walrus said,
“To talk of many things:
Of shoes—and ships—and sealing-wax—
Of cabbages—and kings—
And why the sea is boiling hot—
And whether pigs have wings.”

And so the time has come to give a heartfelt vote of thanks to my two PhD supervisors, Raj Gururajan and Jeff Coutts for the countless hours they devoted to helping me with my PhD journey. At times it seemed to me that the elements of my research were as diverse as cabbages and kings, with little sense to be made from them. At other times it seemed as though I was asking unanswerable questions, like “Why is the sea boiling hot?”, but they helped me to journey on further and dig deeper to find the real meaning in the data and the stories it was whispering. Special thanks go to Kerry Bell for her wonderful assistance with biometrical issues.

I am especially grateful to my family for their understanding and patience when many a night and weekend I was tapping away at the keyboard instead of spending time with them. Thank you Julie, Matthew, Luke and Katie for your generosity.

The author has also appreciated the access to numerous resources provided through his workplace and most importantly the time to focus on these studies as part of his work program, albeit part-time over 10 years. Thanks Peter, Bob and Krista for enabling this to happen. The author is also grateful for the technology that in recent years made the arduous task of seeking and recording bibliographic references so much easier – thanks Google Scholar and EndNote!

Publications produced during this research study

James, J 2010a, 'Save Time and Money with Web Conferencing', *APEN ExtensionNet*, vol. 17, no. 4, p. 1.

---- 2010b, 'Using eExtension to better engage with clients and enable change', in J Jennings, W Packham & D Woodside (eds), *Shaping Change: Natural Resource Management, Agriculture and the Role of Extension*, Australasia-Pacific Extension Network (APEN), Australia, pp. 155-61.

---- 2010c, 'Using Web 2.0 technologies to enable practice change in Australian agriculture', *Extension Farming Systems*, vol. 5, no. 1, pp. 167-72.

---- 2011, *The road less travelled: a balanced approach to eExtension*, Paper presented at the APEN National Forum: Hitting a Moving Target – Sustaining landscapes livelihoods and lifestyles in a changing world, Armidale, NSW, pp. 86-9.

James, J, McIntosh, F & Bath, G 2013, 'Powering adoption by using eExtension wisely', poster presentation at Northern Beef Research Update Conference, Cairns, Australia.

Table of contents

| | |
|--|-----|
| Abstract | ii |
| Certification of Thesis..... | iv |
| Acknowledgments..... | v |
| Publications produced during this research study | vi |
| Table of contents | vii |
| List of figures | ix |
| List of tables..... | xii |
| List of abbreviations and definitions..... | xv |
| 1. Introduction..... | 1 |
| 1.1 Background | 2 |
| 1.1.1. Use of new communication technologies | 2 |
| 1.1.2. Use of the Internet..... | 10 |
| 1.1.3. Australian agriculture..... | 12 |
| 1.1.4. Agricultural extension..... | 15 |
| 1.1.5. eExtension project..... | 17 |
| 1.2 The research problem..... | 17 |
| 1.2.1. Research setting | 18 |
| 1.2.2. Research question | 19 |
| 1.2.3. Thesis outline | 19 |
| 2. Literature review | 23 |
| 2.1 Background theories | 23 |
| 2.1.1. Diffusion of Innovation theory..... | 24 |
| 2.1.2. Technology acceptance models..... | 31 |
| 2.1.3. Switch model..... | 39 |
| 2.1.4. ADOPT model | 41 |
| 2.1.5. Web 2.0 technologies | 47 |
| 2.2 Research questions | 52 |
| 3. Methodology | 53 |
| 3.1 Research philosophy | 53 |
| 3.2 Research methodology | 54 |
| 3.3 Research sampling | 56 |
| 3.4 Data collection | 58 |
| 3.4.1. Surveys..... | 58 |
| 3.5 Research method | 60 |
| 3.5.1. Case studies..... | 60 |
| 3.5.2. Observation | 60 |
| 3.6 Survey methodology | 61 |
| 3.7 Data analysis | 63 |
| 3.8 Conclusion | 66 |
| 4. Results..... | 69 |
| 4.1 eExtension project baseline survey | 69 |
| 4.1.1. Background | 69 |
| 4.1.2. Key results..... | 71 |
| 4.2 Impact of web conferencing..... | 90 |
| 4.2.1. Background | 90 |
| 4.2.2. Key results..... | 91 |
| 4.3 Web conferencing usage | 105 |
| 4.3.1. Background | 105 |

| | | |
|--------|--|-----|
| 4.3.2. | Key results..... | 105 |
| 4.4 | Impact of eSurveys..... | 108 |
| 4.4.1. | Background | 108 |
| 4.4.2. | Key results..... | 108 |
| 4.5 | YouTube video usage..... | 124 |
| 4.5.1. | Background | 124 |
| 4.5.2. | Key results..... | 124 |
| 4.6 | Motivation to adopt an innovation | 127 |
| 4.6.1. | Background | 127 |
| 4.6.2. | Key results..... | 128 |
| 5. | Conclusions and recommendations..... | 173 |
| 5.1 | Conclusions about research issues | 173 |
| 5.2 | Conclusions about the research problem..... | 182 |
| 5.3 | Implications for theory | 182 |
| 5.4 | Implications for policy and practice..... | 185 |
| 5.5 | Implications for methodology | 186 |
| 5.6 | Limitations and implications for further research..... | 187 |
| 5.7 | Conclusion | 187 |
| | References | 189 |
| | Appendices..... | 219 |
| | Appendix 1a. eExtension project baseline survey – Questionnaire | 219 |
| | Appendix 1b. eExtension project baseline survey – Quantitative data..... | 223 |
| | Appendix 1c. eExtension project baseline survey – Qualitative data | 228 |
| | Appendix 2a. Impact of Web Conferencing – Questionnaire..... | 237 |
| | Appendix 2b. Impact of Web Conferencing – Quantitative data..... | 239 |
| | Appendix 2c. Impact of Web Conferencing – Qualitative data..... | 243 |
| | Appendix 3a. Impact of eSurveys – Questionnaire..... | 248 |
| | Appendix 3b. Impact of eSurveys – Quantitative data | 251 |
| | Appendix 3c. Impact of eSurveys – Qualitative data..... | 259 |
| | Appendix 4a. YouTube video training workshop – Questionnaire..... | 263 |
| | Appendix 4b. YouTube video training workshop – Qualitative data | 265 |
| | Appendix 5a. What motivates you to adopt an innovation – Questionnaire..... | 270 |
| | Appendix 5b. What motivates you to adopt an innovation – Modifications to questions..... | 274 |
| | Appendix 5c. What motivates you to adopt an innovation – Quantitative data... | 279 |
| | Appendix 5d. What motivates you to adopt an innovation – Qualitative data | 290 |
| | Appendix 5e. What motivates you to adopt an innovation – Average rating analysis..... | 302 |
| | Appendix 5f. What motivates you to adopt an innovation – Ratings versus degree of usage | 311 |

List of figures

| | |
|---|----|
| Figure 1. The structure of Chapter 1. | 1 |
| Figure 2. Percentage of American adults who use the Internet, 1995 to 2014. | 2 |
| Figure 3. Time taken for technologies to reach 50 million users. | 4 |
| Figure 4. The growth of Facebook active users. | 5 |
| Figure 5. The growth of Twitter activity. | 5 |
| Figure 6. The growth of YouTube uploads showing hours of uploads per minute. | 6 |
| Figure 7. Web 2.0 tools used in the course of conducting business. | 9 |
| Figure 8. Purpose of Web 2.0 tools used by Queensland public authorities. | 10 |
| Figure 9. Farms not using the Internet for business operations (2007-08). | 11 |
| Figure 10. Distribution of beef cattle across Australia. | 12 |
| Figure 11. Geographic distribution of DAFF extension staff. | 15 |
| Figure 12. The overall structure of this PhD thesis. | 20 |
| Figure 13. The structure of Chapter 2. | 23 |
| Figure 14. Elements that influence the spread of a new innovation. | 25 |
| Figure 15. The elements of the Diffusion of Innovations model. | 25 |
| Figure 16. Adopter categorization on the basis of innovativeness. | 26 |
| Figure 17. Increase in market share of new adoption. | 27 |
| Figure 18. Graphical representation of Llewellyn et al.'s model. | 28 |
| Figure 19. Visual representation of the Chasm. | 30 |
| Figure 20. The Gartner Hype cycle. | 31 |
| Figure 21. Interaction of the elements of the Theory of Reasoned Action. | 32 |
| Figure 22. Interaction of the elements of the Theory of Planned Behaviour. | 33 |
| Figure 23. Interaction of the elements of the Technology Acceptance Model. | 34 |
| Figure 24. Interaction of the elements of TAM2. | 34 |
| Figure 25. Interaction of the elements of TAM3. | 35 |
| Figure 26. Interaction of the elements of the UTAUT model. | 36 |
| Figure 27. Annotated summary of UTAUT model. | 38 |
| Figure 28. A visual representation of the Switch model. | 39 |
| Figure 29. Interaction of the elements of the Switch model. | 40 |
| Figure 30. Interaction of the elements of the updated ADOPT model. | 42 |
| Figure 31. The social technographics ladder. | 47 |
| Figure 32. Increase in Internet adoption from 1995 to 2013. | 48 |
| Figure 33. The structure of Chapter 3. | 53 |
| Figure 34. Case study sampling. | 57 |
| Figure 35. Relationship between sample groups. | 57 |
| Figure 36. A screenshot of one of the online surveys. | 61 |
| Figure 37. Example figure showing biplot of the first two principal components. ... | 65 |
| Figure 38. Methodology process flow map. | 67 |
| Figure 39. The structure of Chapter 4. | 69 |
| Figure 40. A screenshot from the eExtension baseline survey. | 70 |
| Figure 41. Distribution of respondents across regions for the 2009 and 2012 surveys. | 72 |
| Figure 42. Change in awareness, relevance and openness. | 72 |
| Figure 43. Awareness of move to Web 2.0. | 73 |
| Figure 44. Relevance of the change to Web 2.0 for participants' work. | 74 |
| Figure 45. Openness to using Web 2.0 technologies. | 75 |
| Figure 46. Average ratings for Familiarity with Web 2.0 eTools. | 77 |

| | |
|--|-----|
| Figure 47. Familiarity with eSurveys..... | 78 |
| Figure 48. Familiarity with web conferencing..... | 78 |
| Figure 49. Average ratings for experience as a reactive user of Web 2.0 eTools..... | 79 |
| Figure 50. Experience as a reactive user with eSurveys..... | 80 |
| Figure 51. Experience as a reactive user with web conferencing..... | 81 |
| Figure 52. Average ratings for experience as proactive user of Web 2.0 eTools..... | 82 |
| Figure 53. Experience as proactive user with eSurveys..... | 83 |
| Figure 54. Experience as proactive user of web conferencing..... | 83 |
| Figure 55. Average ratings for the benefit the work place has received from the respondent using the eTool technologies..... | 85 |
| Figure 56. Distribution of ratings of how much the work place has benefited from respondents using eSurveys..... | 85 |
| Figure 57. Distribution of ratings of how much the work place has benefited from respondents using web conferencing..... | 86 |
| Figure 58. Distribution of respondents by Business group..... | 91 |
| Figure 59. Distribution of respondents by age group..... | 91 |
| Figure 60. Number of web conferences as a host..... | 93 |
| Figure 61. Number of web conferences as a participant..... | 93 |
| Figure 62. Proportion of webinars that have replaced face-to-face meetings..... | 94 |
| Figure 63. Proportion of webinars that were additional opportunities..... | 94 |
| Figure 64. Reasons for signing up to use WebEx..... | 95 |
| Figure 65. Reason for signing up to WebEx: saves time..... | 95 |
| Figure 66. Reason for signing up to WebEx: more regular contact with participants..... | 95 |
| Figure 67. Reason for signing up to WebEx: saves money..... | 96 |
| Figure 68. Reason for signing up to WebEx: based on colleagues success..... | 96 |
| Figure 69. Reason for signing up to WebEx: saves environment..... | 96 |
| Figure 70. Reason for signing up to WebEx: supervisor encourages..... | 97 |
| Figure 71. Extent web conferencing has helped..... | 98 |
| Figure 72. Extent web conferencing has helped: save time..... | 99 |
| Figure 73. Extent web conferencing has helped: save money..... | 99 |
| Figure 74. Extent web conferencing has helped: better engagement with clients/colleagues..... | 100 |
| Figure 75. Extent web conferencing has helped: more innovative with work..... | 100 |
| Figure 76. Extent web conferencing has helped: more responsive to clients/colleagues..... | 100 |
| Figure 77. Reasons for not yet hosting a webinar..... | 103 |
| Figure 78. Average people minutes per webinar..... | 106 |
| Figure 79. Total people minutes per host..... | 106 |
| Figure 80. Total webinars per host..... | 106 |
| Figure 81. Average number of participants per webinar..... | 107 |
| Figure 82. Total people minutes per host..... | 107 |
| Figure 83. Number of electronic surveys conducted in a year..... | 109 |
| Figure 84. Reasons for signing up to use SurveyMonkey..... | 110 |
| Figure 85. Reason for signing up to use SurveyMonkey: quickly see and analyse results..... | 111 |
| Figure 86. Reason for signing up to use SurveyMonkey: no need to decipher hand written responses..... | 111 |
| Figure 87. Reason for signing up to use SurveyMonkey: easy for respondent..... | 111 |

| | |
|--|-----|
| Figure 88. Reason for signing up to use SurveyMonkey: saves time for survey respondent. | 112 |
| Figure 89. Reason for signing up to use SurveyMonkey: saves money (for survey creator). | 112 |
| Figure 90. Reason for signing up to use SurveyMonkey: saves time for survey creator. | 112 |
| Figure 91. Reason for signing up to use SurveyMonkey: saves environment (no paper wasted). | 113 |
| Figure 92. Extent eSurveys helped. | 114 |
| Figure 93. Extent eSurveys have been more efficient (saving time and effort). | 115 |
| Figure 94. Extent eSurveys have helped seek feedback from clients (not after an event). | 115 |
| Figure 95. Extent eSurveys have helped be more responsive to client needs. | 116 |
| Figure 96. Extent eSurveys have helped be more innovative. | 116 |
| Figure 97. Extent eSurveys have helped make better informed decisions. | 117 |
| Figure 98. Extent eSurveys have helped gather feedback after an event. | 117 |
| Figure 99. Reasons for not yet using SurveyMonkey. | 119 |
| Figure 100. Distribution of respondents by Business group. | 120 |
| Figure 101. Distribution of respondents by age group. | 121 |
| Figure 102. Degree of use of technology. | 130 |
| Figure 103. Radar plot of interaction between technology and questions for Diffusion model. | 135 |
| Figure 104. Biplot of the first two principal components for Diffusion model. | 136 |
| Figure 105. UTAUT model - questions classified as human or technology. | 140 |
| Figure 106. Radar plot of interaction between technology and questions for UTAUT model. | 140 |
| Figure 107. Biplot of the first two principal components for UTAUT model. | 141 |
| Figure 108. Switch model - questions classified as human or technology. | 145 |
| Figure 109. Radar plot for Switch model. | 146 |
| Figure 110. Biplot of the first two principal components for Switch model. | 147 |
| Figure 111. ADOPT model - questions classified as human or technology. | 151 |
| Figure 112. Radar plot for ADOPT model. | 152 |
| Figure 113. Biplot of the first two principal components for ADOPT model. | 153 |
| Figure 114. Biplot of the first and third principal components for ADOPT model. | 153 |
| Figure 115. Biplot of the second and third principal components for ADOPT model. | 154 |
| Figure 116. Radar plot of first three principal components for ADOPT model. | 154 |
| Figure 117. Predicted ratings across all adoption model questions. | 159 |
| Figure 118. Concept map generated by Leximancer. | 162 |
| Figure 119. Word cloud generated by Wordle. | 163 |
| Figure 120. Biplot of the first two principal components for all models. | 164 |
| Figure 121. Cluster dendrogram and the resultant four groups. | 165 |
| Figure 122. The structure of Chapter 5. | 173 |
| Figure 123. Interaction of the elements of the UTAUT2 model. | 175 |
| Figure 124. Interaction of the elements of the User benefits model. | 179 |

List of tables

| | |
|--|-----|
| Table 1. Distribution of extension staff across DAFF business groups..... | 14 |
| Table 2. Distribution of extension staff across DAFF regions..... | 14 |
| Table 3. Summary of models being considered..... | 45 |
| Table 4. Categorisation of Web 2.0 technologies..... | 48 |
| Table 5. Summary of surveys used in this research study..... | 59 |
| Table 6. Example table showing absolute size of the loadings relative to each other. | 64 |
| Table 7. Changes in reactive and proactive use of eTools..... | 84 |
| Table 8. Age distribution of DAFF staff and respondents..... | 92 |
| Table 9. Gender balance of respondents..... | 92 |
| Table 10. Summary of web conferencing usage per host..... | 105 |
| Table 11. Gender balance of respondents..... | 121 |
| Table 12. Age distribution of DAFF staff and respondents..... | 122 |
| Table 13. Percentages of respondents to survey..... | 129 |
| Table 14. Summary of participant demographics..... | 129 |
| Table 15. Summary of DAFF employee demographics..... | 130 |
| Table 16. Summary of responses to Diffusion of innovation model questions..... | 133 |
| Table 17. Predictions of ratings for each technology..... | 134 |
| Table 18. Summary of responses to UTAUT model questions..... | 138 |
| Table 19. Summary of results for UTAUT model human/ technology analysis..... | 139 |
| Table 20. Summary of responses to Switch model questions..... | 144 |
| Table 21. Summary of results for Switch model human/ technology analysis..... | 145 |
| Table 22. Summary of responses to ADOPT model questions..... | 149 |
| Table 23. Summary of results for ADOPT model human/ technology analysis..... | 151 |
| Table 24. Summary of individual question ratings for the four models..... | 157 |
| Table 25. Summary of human/ technology ratings for all models..... | 161 |
| Table 26. Contribution of the four original models to the four groups..... | 165 |
| Table 27. Alignment of research results and extant literature: webinars..... | 176 |
| Table 28. Alignment of research and extant literature: eSurveys..... | 177 |
| Table 29. Averaged ratings for technologies across models..... | 178 |
| Table 30. Contribution to existing knowledge..... | 188 |
| Table 31. Regional distribution of respondents across surveys..... | 223 |
| Table 32. Contingency tables for regional distribution of respondents across surveys. | 224 |
| Table 33. Analysis of Awareness, Relevance and Openness data..... | 224 |
| Table 34. Analysis of Familiarity with Web 2.0 tools..... | 224 |
| Table 35. Analysis of Familiarity with eSurveys..... | 225 |
| Table 36. Analysis of Familiarity with Web conferencing..... | 225 |
| Table 37. Analysis of Experience as a reactive user..... | 225 |
| Table 38. Analysis of Experience as a reactive user of eSurveys..... | 225 |
| Table 39. Analysis of Experience as a reactive user of web conferencing..... | 225 |
| Table 40. Analysis of Experience as a proactive user..... | 225 |
| Table 41. Analysis of Experience as a proactive user of eSurveys..... | 226 |
| Table 42. Analysis of Experience as proactive user of web conferencing..... | 226 |
| Table 43. Analysis of work place benefit from eTools..... | 226 |
| Table 44. Thematic analysis of comments from 2012 survey relating to awareness, relevance and openness..... | 228 |

| | |
|---|-----|
| Table 45. Comments on familiarity of eTools from the 2012 survey..... | 229 |
| Table 46. Feedback regarding eSurveys. | 229 |
| Table 47. Feedback regarding web conferencing. | 230 |
| Table 48. Comments on ways eExtension interests the respondents. | 231 |
| Table 49. Other comments from the respondents. | 234 |
| Table 50. Quantitative analysis of data for Reasons for signing up to use WebEx. | 239 |
| Table 51. Quantitative analysis of Extent web conferencing has helped..... | 240 |
| Table 52. Quantitative analysis of Reasons for not yet hosting a webinar. | 240 |
| Table 53. Quantitative analysis of Effect of business group..... | 241 |
| Table 54. Quantitative analysis of Effect of age. | 241 |
| Table 55. Quantitative analysis of Effect of gender..... | 242 |
| Table 56. Qualitative analysis of Reasons for signing up for WebEx. | 243 |
| Table 57. Qualitative analysis of Comments on how web conferencing has helped. | 245 |
| Table 58. Qualitative analysis of brief stories about how web conferencing has helped. | 245 |
| Table 59. Quantitative analysis of Number of surveys conducted in a year..... | 251 |
| Table 60. Quantitative analysis of Reasons for signing up to use SurveyMonkey.. | 252 |
| Table 61. Quantitative analysis of Extent eSurveys helped. | 252 |
| Table 62. Quantitative analysis of Reasons for not yet using SurveyMonkey. | 253 |
| Table 63. Quantitative analysis of Business group. | 254 |
| Table 64. Quantitative analysis of Gender. | 256 |
| Table 65. Quantitative analysis of Age. | 257 |
| Table 66. Qualitative analysis of Comments on changes to number or types of surveys. | 259 |
| Table 67. Qualitative analysis of Comments on the reasons for signing up to use SurveyMonkey. | 260 |
| Table 68. Comments on how well SurveyMonkey has helped..... | 260 |
| Table 69. Qualitative analysis of Brief stories on how eSurveys have helped. | 260 |
| Table 70. Qualitative analysis of Comments regarding the reasons why not using SurveyMonkey. | 262 |
| Table 71. Qualitative analysis of Factors encouraging respondents to make videos. | 265 |
| Table 72. Qualitative analysis of Factors discouraging participants to create/ use videos. | 267 |
| Table 73. Qualitative analysis of Factors needed to maximise creation/use of videos. | 268 |
| Table 74. Quantitative analysis of participant demographics. | 279 |
| Table 75. Results of analysis of variance of ratings from Diffusion of innovation model questions..... | 279 |
| Table 76. Analysis of variance of Diffusion of innovation question responses..... | 279 |
| Table 77. Principal Components Analysis for Diffusion model. | 280 |
| Table 78. Absolute size of the loadings relative to each other for Diffusion model. | 280 |
| Table 79. Results of analysis of variance of ratings from UTAUT model questions. | 280 |
| Table 80. Predictions of ratings for each technology..... | 281 |
| Table 81. Analysis of variance of UTAUT model..... | 281 |
| Table 82. Principal Components Analysis for UTAUT model..... | 281 |
| Table 83. Absolute size of the loadings relative to each other for UTAUT model. | 282 |

| | |
|---|-----|
| Table 84. Results of analysis of variance of ratings from Switch model questions. | 282 |
| Table 85. Predictions of ratings for each technology..... | 282 |
| Table 86. Analysis of variance of Switch model. | 283 |
| Table 87. Absolute size of the loadings relative to each other for Switch model.... | 283 |
| Table 88. Size of the loadings relative to each other for Switch model..... | 283 |
| Table 89. Results of analysis of variance of ratings from ADOPT model questions. | 283 |
| Table 90. Predictions of ratings for each technology..... | 284 |
| Table 91. Analysis of variance of ADOPT model. | 284 |
| Table 92. Absolute size of the loadings relative to each other for ADOPT model.. | 285 |
| Table 93. Size of the loadings relative to each other for ADOPT model. | 285 |
| Table 94. Analysis of variance across all models. | 286 |
| Table 95. Absolute size of the loadings relative to each other for all models. | 286 |
| Table 96. Absolute size of the loadings relative to each other..... | 286 |
| Table 97. The model of origin of contributing elements to the four new groups. ... | 288 |
| Table 98. Comments made about the degree of usage. | 290 |
| Table 99. Previous methods used before adopting this technology. | 291 |
| Table 100. Factors that encouraged use of technology. | 294 |
| Table 101. Factors that discouraged use of technology. | 298 |

List of abbreviations and definitions

| | |
|--------|--|
| ABS | Australian Bureau of Statistics |
| ABARES | Australian Bureau of Agriculture and Resources Economics and Sciences |
| ADOPT | Adoption and Diffusion Outcome Prediction Tool |
| ANOVA | Analysis of Variance |
| DAFF | Department of Agriculture, Fisheries and Forestry <i>Note: While Department of Primary Industries and Fisheries (DPI&F) was the name of the department at the commencement of this study, it subsequently changed to DEEDI (Department of Employment, Economic Development and Innovation) in 2009 and then to DAFF (Department of Agriculture, Fisheries and Forestry) in 2012. For reading continuity, all references to the Department have been changed to DAFF, irrespective of the timing of the reference.</i> |
| EVAO | Estimated Value of Agricultural Operations |
| ICT | Information and Communication Technologies |
| IT | Information Technology |
| LSD | Least Significant Differences |
| NBN | National Broadband Network |
| OGP | Open Government Partnership |
| PCA | Principal Components Analysis |
| R&D | Research and Development |
| RD&E | Research Development and Extension |
| TAM | Technology Acceptance Model |
| TAM2 | An extension of TAM |
| TAM3 | A further extension of TAM |
| TPB | Theory of Planned Behaviour |
| TRA | Theory of Reasoned Action |
| UK | United Kingdom |
| UTAUT | Unified Theory of Acceptance and Use of Technology |

Note: the terms Web 2.0 and ‘new communication technologies’ are used interchangeably in this thesis.