UNDERSTANDING THE SUSTAINABILITY OF VIRTUAL COMMUNITY: MODEL DEVELOPMENT AND EMPIRICAL TEST

CHEUNG MEI KWAN, CHRISTY

DOCTOR OF PHILOSOPHY
CITY UNIVERSITY OF HONG KONG
MARCH 2007
Understanding the Sustainability of Virtual Community: Model Development and Empirical Test
探討虛擬社群的持續發展：
理論演化及驗證

Submitted to
Department of Information Systems
資訊系統學系
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy
哲學博士學位

by

Cheung Mei Kwan, Christy
張美君

March 2007
二零零七年三月
Abstract

With the proliferation of information and communication technologies, there is an expanded opportunity for the public to be involved in knowledge exchange. However, the creation of an online social space (e.g., virtual community) does not guarantee that knowledge exchange will actually take place. The success of a virtual community depends primarily on whether members are willing to continue to use the community, as well as to share and adopt knowledge. If there are a lot of participants who are willing to stay and contribute their knowledge in the virtual community, this will improve the likelihood of connecting to individuals who are able and willing to help.

The motivation of this study is to better understand the sustainability of virtual communities, specifically, user continuance behaviors. Given the limited research in the area of information systems continuance, this study seeks to divulge the factors that shape the continuance of a virtual community, and the continuance of knowledge adoption and knowledge sharing behaviors.

The first research model (User continuance intention with the virtual community) uses four key theoretical backgrounds and incorporates the key constructs from the literature of the IS continuance model, relationship marketing, social influence, and uses and gratifications to explain user intention to continue using the virtual community. The second research model (User continuance intention of knowledge adoption) extends the information adoption model in the continuance stage and
explains user intention to continue adopting and using knowledge in the online discussion forum. Finally, the third research model (User continuance intention of knowledge sharing) builds upon the Batson’s framework of the act for public good and explains user intention to continue sharing knowledge in the online discussion forum. This model also takes the user evaluation process into consideration and incorporates in the investigation constructs like disconfirmation and satisfaction.

The empirical research was conducted in Hong Kong Education City (www.hkedcity.net). Hong Kong Education City (HKed City) is a leading and one-stop education portal with a vision to build Hong Kong into a learning city. An invitation email with a URL to the online questionnaire was sent to the potential respondents who are primary and secondary school teachers in Hong Kong. A total of 315 respondents filled in the online questionnaire. Among the respondents, there were 144 knowledge adopters and 60 knowledge contributors. The survey data was analyzed using Partial Least Squares. The measurement models were first assessed, and then the structural models were evaluated.

The results of the first model show that the relationships proposed in the research model are largely supported. In particular, satisfaction and group norms exert significant effects on user continuance intention, and purposive value and self-discovery are the two key values that both explain satisfaction and group norms. The results of the second research model also provide support to the hypothesized relationships. User satisfaction and information usefulness have significant effects
on user intention to continue adopting knowledge in an online discussion forum, whilst information usefulness is determined by both information quality and source credibility. Finally, the third research model empirically demonstrates that moral obligation and commitment (sense of belonging) have the strongest influence on user continuance intention. The results also provide support to the expectancy confirmation theory, where users evaluate and compare their experiences with their expectations. User satisfaction is affected by both disconfirmations of helping others and reciprocity, while knowledge self efficacy is determined by the disconfirmation of helping others.

This research seeks to provide important theoretical and practical contributions. On the theoretical side, most existing studies only addressed the concern of user acceptance of online social structures for knowledge sharing and adoption. This study is one of the very first studies that adopts a comprehensive approach to explain user continuance behaviors, including both knowledge adoption and knowledge sharing in a virtual community. In addition, the research models use theories from different theoretical perspectives, providing support to an integration of cross-disciplinary studies in virtual community research. On the practical side, the results of this study provide virtual community designers some tangible recommendations for helping their members to continue to share and adopt knowledge.
# Table of Contents

Abstract iii  
Certification of Approval vi  
Acknowledgements vii  
Table of Contents viii  
List of Figures xii  
List of Tables xiii  
Chapter 1 Introduction 1  
1.1 Research Justification 2  
1.1.1 Importance of Knowledge Management and Virtual Community 2  
1.1.2 Shortcomings of Existing Research 4  
1.2 Research Questions 7  
1.3 Research Scope 7  
1.4 Expected Contributions 11  
1.5 Structure of the Dissertation 12  
Chapter 2 Literature Review 16  
2.1 Virtual Communities 16  
2.1.1 Computer-Mediated Communication Technologies 17  
2.1.2 Member-Generated Content in Virtual Communities 18  
2.1.3 Characteristics of Virtual Professional Communities 19  
2.2 Research on Virtual Communities 20  
2.2.1 Virtual Community Research in Information Systems 21  
2.2.2 Virtual Community Research in Other Disciplines 22  
2.2.3 Virtual Community Research – Research Methodology 23  
2.3 Understanding the Sustainability of Virtual Communities 24  
2.3.1 Information Systems Continuance 25  
2.3.2 Relationship Marketing 28  
2.3.3 Social Influence 31  
2.3.4 Uses and Gratifications 33  
2.4 Understanding the Continuance of Knowledge Exchange in Virtual Communities 35  
2.4.1 Participation in Virtual Communities 36  
2.4.2 Understanding Continuance Behavior 37  
2.5 Understanding Knowledge Adoption Behavior in an Online
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Discussion Forum</strong></td>
<td></td>
</tr>
<tr>
<td>2.5.1 Information Systems Success Model</td>
<td>39</td>
</tr>
<tr>
<td>2.5.2 Information Adoption Model</td>
<td>43</td>
</tr>
<tr>
<td><strong>2.6 Understanding Knowledge Sharing Behavior in an Online Discussion</strong></td>
<td>46</td>
</tr>
<tr>
<td>2.6.1 Public Goods, Social Dilemmas, and Collective Action</td>
<td>46</td>
</tr>
<tr>
<td>2.6.2 Theories of Collective Action</td>
<td>47</td>
</tr>
<tr>
<td>2.6.3 Batson’s Framework of the Act of Public Good</td>
<td>50</td>
</tr>
<tr>
<td>2.6.4 Applying Batson’s Framework in Knowledge Sharing</td>
<td>53</td>
</tr>
<tr>
<td><strong>Chapter 3 Understanding User Intention to Continue Using a Virtual Community</strong></td>
<td>56</td>
</tr>
<tr>
<td>3.1 Intention to Continue Using a Virtual Community</td>
<td>57</td>
</tr>
<tr>
<td>3.2 The Relational Constructs and Intention to Continue Using a Virtual Community</td>
<td>59</td>
</tr>
<tr>
<td>3.2.1 Satisfaction and its Relationship with Intention to Continue Using a Virtual Community</td>
<td>60</td>
</tr>
<tr>
<td>3.2.2 Commitment and its Relationship with Intention to Continue Using a Virtual Community</td>
<td>62</td>
</tr>
<tr>
<td>3.2.3 Group Norms and its Relationship with Intention to Continue Using a Virtual Community</td>
<td>63</td>
</tr>
<tr>
<td>3.2.4 Satisfaction and Commitment</td>
<td>64</td>
</tr>
<tr>
<td>3.2.5 Group Norms and Commitment</td>
<td>65</td>
</tr>
<tr>
<td>3.3 The Needs (Values) of Using a Virtual Community</td>
<td>65</td>
</tr>
<tr>
<td>3.3.1 Satisfaction and the Values of Using a Virtual Community</td>
<td>66</td>
</tr>
<tr>
<td>3.3.2 Commitment and the Values of Using a Virtual Community</td>
<td>67</td>
</tr>
<tr>
<td>3.3.3 Group Norms and the Values of Using a Virtual Community</td>
<td>68</td>
</tr>
<tr>
<td><strong>Chapter 4 Understanding User Intention to Continue Adopting Knowledge in an Online Discussion Forum</strong></td>
<td>70</td>
</tr>
<tr>
<td>4.1 Intention to Continue Adopting Knowledge in an Online Discussion Forum</td>
<td>71</td>
</tr>
<tr>
<td>4.2 User Satisfaction and Information Usefulness</td>
<td>71</td>
</tr>
<tr>
<td>4.3 Information Quality</td>
<td>73</td>
</tr>
<tr>
<td>4.4 Source Credibility</td>
<td>74</td>
</tr>
<tr>
<td><strong>Chapter 5 Understanding User Intention to Continue Sharing Knowledge in an Online Discussion Forum</strong></td>
<td>77</td>
</tr>
<tr>
<td>5.1 Intention to Continue Sharing Knowledge in an Online Discussion Forum</td>
<td>78</td>
</tr>
<tr>
<td>5.2 Collectivism – Commitment (Sense of Belonging)</td>
<td>78</td>
</tr>
</tbody>
</table>
5.3 Principlism – Moral Obligation 79
5.4 Egoism – Reciprocity 80
5.5 Altruism – Enjoyment of Helping and Helping Behavior 82

Chapter 6 Research Methodology 85
6.1 Online Survey Research Design 85
6.2 Research Setting 88
   6.2.1 Online Questionnaire 89
   6.2.2 Creation and Use of Multi-Item Scales 91
   6.2.3 Pretest 96
   6.2.4 Data Collection 97
   6.2.5 Survey Response 97
   6.2.6 Common Method Variance 98
6.3 Demographic Profiles 99
   6.3.1 Respondent Profile and Usage Behavior 100
   6.3.2 Users of the Online Discussion Forum 102
   6.3.3 Knowledge Contribution to the Online Discussion Forum 107
6.4 Data Analysis Plan 111
   6.4.1 Structural Equation Modeling 111
   6.4.2 Sample Size Determination 114

Chapter 7 Data Analysis 115
7.1 Measurement Model Evaluation 115
   7.1.1 Convergent Validity 116
   7.1.2 Reliability 116
   7.1.3 Discriminant Validity 119
7.2 Structural Model Evaluation 122
   7.2.1 Results for Model 1: Intention to Continue Using a Virtual Community 122
   7.2.2 Results for Model 2: Intention to Continue Adopting Knowledge in an Online Discussion Forum 124
   7.2.3 Results for Model 3: Intention to Continue Sharing Knowledge in an Online Discussion Forum 126

Chapter 8 Discussion and Conclusion 127
8.1 Discussion of Results 127
   8.1.1 Model 1 – Intention to Continue Using a Virtual Community 128
   8.1.2 Model 2 – Intention to Continue Adopting Knowledge in an Online Discussion Forum 132
   8.1.3 Model 3 – Intention to Continue Sharing Knowledge in an Online 135
8.2 Implications for Research and Practice

8.2.1 Implications for Researchers
8.2.2 Implications for Practitioners

8.3 Limitations

8.3.1 Cross-Sectional Nature
8.3.2 Potential Biases in Data Collection and Interpretation
8.3.3 Generalization

8.4 Directions for Future Research

8.4.1 From Retention to Attraction
8.4.2 From Professional Group to Social Group
8.4.3 From Enablers to Inhibitors
8.4.4 From I-Intention to We-Intention
8.4.5 Multimethod Approach

Reference
# List of Figures

## Chapter 1 Introduction
- Figure 1.3 Screenshot of Home page of Hong Kong Education City  
  Page 9
- Figure 1.4 The Research Focuses  
  Page 13
- Figure 1.5 The Overall Structure of the Dissertation  
  Page 15

## Chapter 2 Literature Review
- Figure 2.3 IS Continuance Model (Bhattacherjee 2001)  
  Page 27
- Figure 2.4 Satisfaction Formation Process  
  Page 38
- Figure 2.5.1 Updated D&M IS Success Model  
  Page 40
- Figure 2.5.2 Information Adoption Model  
  Page 44

## Chapter 3 User Intention to Continue Using a Virtual Community
- Figure 3.1 Model 1 Intention to Continue Using a Virtual Community  
  Page 57

## Chapter 4 Understanding User Intention to Continue Adopting Knowledge in Online Discussion Forum
- Figure 4.1 Model 2 Intention to Continue Adopting Knowledge in an Online Discussion Forum  
  Page 70

## Chapter 5 Understanding User Intention to Continue Sharing Knowledge in an Online Discussion Forum
- Figure 5.1 Model 3 Intention to Continue Sharing Knowledge in an Online Discussion Forum  
  Page 77

## Chapter 6 Research Methodology
- Figure 6.2.1 Flow of Online Questionnaire  
  Page 90
- Figure 6.2.2 Slider Scale  
  Page 96

## Chapter 7 Data Analysis
- Figure 7.1: PLS Results for Model 1 (Note: **p<0.05, ***p<0.01)  
  Page 123
- Figure 7.2: PLS Results for Model 2 (Note: **p<0.05, ***p<0.01)  
  Page 125
- Figure 7.3: PLS Results for Model 3 (Note: **p<0.05, ***p<0.01)  
  Page 126

## Chapter 8 Discussion and Conclusion
- Figure 8.3: An Exploratory Model of Word of Mouth  
  Page 150
List of Tables

Chapter 2 Literature Review
Table 2.1.1 Comparisons of Discussion Forum, Weblog, and Wiki 18
Table 2.1.2 Characteristics of Knowledge in Communities of Practice 19
Table 2.1.3 The Characteristics of an Electronic Network of Practice 20
Table 2.3 Uses and Gratification Typologies of the Internet 35
Table 2.6 Key Factors of Knowledge Sharing in Pervious Studies 54

Chapter 3 User Intention to Continue Using a Virtual Community
Table 3.3 The Values of Using a Virtual Community 69

Chapter 6 Research Methodology
Table 6.1.1 Major Strengths of Online Survey Design 86
Table 6.1.2 Major Weakness of Online Survey Design 87
Table 6.2.1 Measuring Items of Model 1 93
Table 6.2.2 Measuring Items of Model 2 94
Table 6.2.3 Measuring Items of Model 3 95
Table 6.2.5 Nonresponse Error Estimation 99
Table 6.3.1a Demographic Statistics of the Respondents 100
Table 6.3.1b Usage Behavior with the Teachers’ Channel 101
Table 6.3.2a Users vs. Non-Users of the Online Discussion Forum 103
Table 6.3.2b Users vs. Non-Users of the Online Discussion Forum (Usage Behavior with the Teachers’ Channel) 104
Table 6.3.2c Chi-square Tests for Users and Non-Users of the Online Discussion Forum 106
Table 6.3.3a Contributors vs. Non-Contributors to the Online Discussion Forum 107
Table 6.3.3b Contributors vs. Non-Contributors of the Online Discussion Forum (Usage Behavior with the Teachers’ Channel) 109
Table 6.3.3c Chi-square Tests for Contributors and Non-Contributors of the Online Discussion Forum 110
Table 6.4 Comparisons of Component-based SEM and Covariance-based SEM Approaches (adopted from Chin 1998) 113

Chapter 7 Data Analysis
Table 7.1.1a Descriptive Statistics for Model 1 117
Table 7.1.2a Descriptive Statistics for Model 2 118
Table 7.1.3a Descriptive Statistics for Model 3 119
Table 7.1.1b Correlations of Constructs for Model 1 (Diagonal elements are square roots of the average variance extracted) 120
Table 7.1.2b Correlations of Constructs for Model 2 (Diagonal elements are square roots of the average variance extracted) 120
Table 7.1.3b Correlations of Constructs for Model 3 (Diagonal elements are
square roots of the average variance extracted)

Table 7.1.4a Chi-square Test for Discriminant Validity (Disconfirmation of Reciprocity and Moral Obligation) 121
Table 7.1.4b Chi-square Test for Discriminant Validity (Disconfirmation of Reciprocity and Commitment) 121
Table 7.1.4c Chi-square Test for Discriminant Validity (Moral Obligation and Commitment) 122

Chapter 8 Discussion and Conclusion
Table 8.1.1 Results of Model 1 129
Table 8.1.2 Results of Model 2 133
Table 8.1.3 Results of Model 3 136
Table 8.2.1 Suggestions for maintaining a sustainable virtual community 143
Table 8.2.2 Suggestions for Encouraging Users to Continue Using Knowledge in the Online Discussion Forum 144
Table 8.2.3 Suggestions for Encouraging Users to Continue Sharing Knowledge in the Online Discussion Forum 145