UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Towards a conceptual framework for understanding the implementation of Internet-based self-service technology

by

Thavandren Ramsamy Naidoo

BCom(Natal), BComHons(Unisa), BComHons(Wits),
MCom(Wits), PDipMkt(IMM)

Submitted in fulfilment of the requirements for the degree

Philosophiae Doctor (Information Technology)

in the Faculty of Engineering, Built Environment and Information Technology

at the

University of Pretoria

Pretoria April 2008

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Towards a conceptual framework for understanding the implementation of Internet-based self-service technology

ABSTRACT

CANDIDATE: Thavandren Ramsamy Naidoo

PROMOTER: Prof A C Leonard

DEPARTMENT: School of Information Technology

DEGREE: Philosophiae Doctor (Information Technology)

KEYWORDS: e-commerce, e-service, Internet, ICT, self-service technology, implementation, actor-network theory, structuration theory, consumer-driven healthcare

In the past decade, there has been rampant growth in healthcare service delivery options, based on the Internet and related information and communication technology. As a result, there is a great deal of expectation among national governments, regulators, healthcare organisations, and other stakeholders about the role of the Internet in healthcare service provision. Given the global crisis in healthcare services generally and the funding of healthcare services specifically, a number of policymakers view the advances in Internet-based self-service technology as a potential enabler of more efficient and effective healthcare service delivery. Proponents of consumer-driven healthcare in particular who seek to use the Internet to make consumers more informed about healthcare funding decisions and to reduce the cost of servicing consumers have been actively experimenting in this area. Despite the accelerating growth in the deployment of Internet-based self-service technologies, their protracted uptake by users is giving rise to concerns about the effectiveness of the implementation and acceptance of these contemporary forms of service delivery. Furthermore, little is known about how the social healthcare context shapes Internet-based self-service technology implementations.

This thesis presents an in-depth qualitative case study that documents a healthcare insurer's efforts to implement an online self-service technology for the period 1999 to 2005. A research

framework was adopted that draws on key theoretical concepts from structuration and actor-network theory (ANT) to link the social context to implementation processes. These two conceptual lenses, which are compatible with the thesis's interpretive stance, reveal several new insights, confirming that the challenges associated with the implementation of information system innovations such as Internet-based self-service technologies cannot be understood in isolation. From a structuration perspective analysing the various enactments of self-service provision of healthcare afforded a deeper understanding of how social practices influence the design and use of the technology. From an ANT perspective, the study showed how the major translations in the design and use of the self-service technology emerged from a process where technological and social elements co-evolved. This study also reveals that the implementation problems and opportunities facing this particular healthcare insurance organisation were historical and systemic. This approach demonstrates that the complex interdependencies and interactions among contrasting social, political, economic and technological issues shaped the contemporary channel as it exists today and therefore advances theory in yet another important way.

Using the insights obtained from these two theories, a conceptual framework was derived. The conceptual framework demonstrates that in order to develop a comprehensive understanding of Internet-based self-service technology implementation, such an analysis must incorporate the interconnectedness of four perspectives – meaning, process, context and the technology artefact – and their respective conceptual elements from both structuration and actor-network theory. Future studies attempting to deepen our understanding of information systems implementation can also provide constructive insights by focusing on the interdependent, interconnected and historical nature of the implementation phenomenon. Some important practical applications for future self-service technology implementations are also discussed.

I declare that

Towards a conceptual framework for understanding the implementation of Internet-based self-service technology

is my own work and that all sources that I have used or quoted have been indicated and acknowledged by means of complete references

Thavandren Ramsamy Naidoo

DEDICATION

To my partner ***Losh*** and our children ***Shiven*** and ***Veshni***

In memory of my father ***Ramsamy (Siva) Naidoo***

ACKNOWLEDGEMENTS

I am deeply indebted to a number of people for their help and generous support over the past five years. I would like to thank especially the following people:

Firstly, I would like to thank my promoter, Professor A. C. Leonard for his insight and guidance. His vast experience, knowledge and ability to stimulate the development of ideas were invaluable. To Dr. Elaine Byrne who helped me package and position the essence of my argument. To the Department of Informatics staff, especially Professor Carina De Villiers, at the University of Pretoria who urged me 'to start writing', a huge thank you. To Professor Roode and Professor Introna, thank you for challenging my worldview and for introducing me to the world of Interpretivism.

My gratitude also extends to the members of the SST's management and implementation team and related business areas whose direct contribution to this study during trying times, made this research possible. To all the researchers that I have referenced and corresponded with, especially to those on Actor-Network theory, Structuration theory, IS implementation and Self-service technology who paved the way for me (I feel like I have stood on the shoulders on giants), many thanks.

My partner Losh, my son Shiven, daughter Veshni have been helpful at all times and accepted my absence when duty to the work at hand called. I value their love and support immensely.

TABLE OF CONTENTS

List of Tables

List of Figures

List of Maps and Photographs

List of Common Acronyms and Initialisms

ANT	Actor-network theory
API	Application programming interface
ATG	Applied Technology Group
ATB	Above-threshold benefit
B2B	Business to business
B2C	Business to consumer
BA	Business analyst
BBEE	Broad-based black economic empowerment
BEE	Black economic empowerment
BHC*	British Healthcare Company
BPR	Business process re-engineering
CASE	Computer-aided software engineering
CDH	Consumer-driven healthcare
CIO	Chief information officer
CMS	Council for the Medical Schemes
COO	Chief operating officer
CPI	Consumer Price Index
CRM	Customer relationship management
D2C	Direct to consumer
EDI	Electronic data interchange
eHIC *	The e-commerce subsidiary of United Assurance Group
ERP	Enterprise resource planning
FAQs	Frequently asked questions
FSG*	Financial Services Group
HAS	Health savings account

HIC*	Health Insurance Company
HISO	Health International Services Organisation
HMO	Health Maintenance Organisation
HR	Human resources
H-World*	Health World (which was the initial brand name of the website)
ICT	Information and communication technology
IJVP*	International joint venture partner
IS	Information systems
IT	Information technology
JSE	Johannesburg Stock Exchange
JV	Joint venture
LAC*	Life Assurance Company
LIMS	Low income medical scheme
MSA	Medical saving account
NHS	National Health Service (UK)
NCSS	Network-based customer service system
OCR	Optical character recognition
OO	Object oriented
OPP	Obligatory passage point
PDA	Personal digital assistant
PPO	Preferred provider option
R	South African rand (currency)
SBU	Strategic business unit
SDLC	Systems development lifecycle
SMS	Short message service
SOA	Service-oriented architecture

SPG	Self-payment gap
SST	Self-service technology
ST	Structuration theory
TAM	Technology acceptance model
TR	Technology readiness
TRA	Theory of reasoned action
UAG*	United Assurance Group
USHC*	United States Healthcare Company
VPN	Virtual private network
WAP	Wireless application protocol
WHO	World Health Organisation
WSC*	Wellness Science Company

* Refers to anonyms chosen to preserve the confidentiality of the identities of the organisations involved.