

## Preface

Governments all around the world are encouraging broadband internet connectivity amongst its citizens. This is because broadband is portrayed as a means to increase the international competitiveness of a country and its role is seen as being critical to the growth and adoption of electronic commerce and other advanced e-services and applications, such as VoIP. Broadband connectivity can benefit a national economy in a number of ways as it has the potential to deliver economic value, public value, efficiencies in the public sector and improving citizens' lives. The prospective benefits of broadband clearly suggest that accessibility, adoption and use of broadband are likely to transform and affect almost every aspect of everyday life. Therefore, in order to realise the full potential that broadband offers, a number of countries have considered/are considering the diffusion and use of broadband technologies as an important item in their policy agendas.

Nevertheless, despite a large investment in developing the infrastructure and the provision of broadband access at affordable prices, the demand for broadband has not increased as expected in many countries around the globe. The slow rate of broadband adoption can be considered to be demand constrained in the developed countries where high speed access is made available to the majority of the population. Broadband penetration differs greatly across countries; for example, according to recent Organisation of Economic Cooperation and Development (OECD) statistics, some countries such as South Korea have reached a steady state, whilst others such as Greece represent much lower levels of penetration (OECD, 2005). This means that in order to enhance the homogenous adoption and use of broadband and to reduce the digital divide, it is essential to focus upon understanding the consumer or micro level factors influencing the deployment and use of broadband.<sup>1</sup>

The aim of this book is to provide an understanding of consumer-level factors affecting the adoption of broadband. It also aims to understand the usage of broadband and its impact upon consumers. The book is expected to contribute towards theory, practice and policy. The theoretical contribution of this research is that it synthesises the existing literature in order to enhance knowledge of broadband adoption, usage and impact from a global perspective. The theories that the book has specifically contributed to include diffusion of innovations, technology acceptance theories such

as the technology acceptance model (TAM) and the theory of planned behaviour (TPB), policy making for telecommunications and consumer behaviour. Considering the slow adoption of broadband, it can be learnt that the policy makers and the providers of the innovation—in this case the telecommunications industry—hold a particular interest in the findings of this study. Policy makers are currently investigating how to increase the diffusion of broadband within their own country, and so information on other countries' experiences can prove useful. The telecommunications industry is interested in determining how to improve their current strategies. Therefore, for both policy and practice, this book will offer an understanding of the broadband diffusion strategies at both the macro and micro levels.

This is particularly useful as there is little research published in the area of consumer adoption, usage and impact of broadband. Understanding the usage and impact of broadband will be helpful for content-developing organisations to integrate compelling content with new generation broadband and will also help broadband service providers to improve their service.

The book is likely to enhance the understanding of how to encourage the adoption of broadband and other emerging telecommunication technologies and applications and will also help to formulate a strategy to bridge the digital divide. Therefore, the book will be an interesting read for various audiences, including broadband service providers, policy makers, academics/researchers, taught and research students of information systems, IT/telecom and marketing management. New doctoral students generally face problems in selecting and justifying the theories, models and research approaches in order to undertake and accomplish his/her research. The content of this book illustrates a systematic review of the various theories, models and research approaches which led to the selection and justification of the appropriate constructs from the different theories/models and, eventually, led to the development of a conceptual model. This book also illustrates the systematic selection and justification of a relevant research approach to test the conceptual model. This suggests that this book will provide very useful reading for new researchers including doctoral candidates.

In order to cater for the information needs of diverse readers and also to effectively deal with this complex but emerging topic, the book is structured into four divisions comprising of 15 chapters. The first division is divided into four sections. A brief description of each division, section and chapter is provided below.

**Division 1**, entitled *The United Kingdom Case Study* examines the consumer adoption, usage and impact of broadband in UK households. This division also discusses the emerging issues such as the impact of broadband on awareness and adoption of new electronic services and also the consumer perception of the service quality of broadband subscription in the UK. This division is further organised into four sections as described below:

The **first section**, entitled *The Theoretical Underpinning*, establishes the research problem, looks at the relevance of the research, defines the research aims and ob-

jectives, reviews the relevant technology adoption theories and models, and finally develops a conceptual model of broadband adoption, usage and impact. Section I consists of the following two chapters: Chapter 1, *Introduction*, and Chapter 2, *Conceptual Model for Examining Consumer Broadband Adoption*. Chapter 1 is useful for all potential readers (i.e., broadband service providers, policy makers, academics/researchers and taught and research students). Chapter 2 is particularly useful for specific audiences, such as academics/researchers and taught and research students.

**Chapter 1** provides an overview for the research area. The chapter first describes the research problem and outlines the scope of this study. It then analyses the state of the research in the area of broadband adoption, usage and impact from a household consumer perspective. This leads to an outline of the research aims and objectives that this research has addressed, followed by a brief description of the research methodology that was utilised to conduct this research. The chapter then outlines the contributions that this research will make.

**Chapter 2** first reviews and assesses the appropriateness of previous technology adoption models and constructs used to study broadband diffusion. It then provides further theoretical justification for selecting the constructs that are used to study broadband diffusion formulates the research hypotheses and finally draws a conceptual model of broadband adoption. The chapter also discusses the usage and impact aspect of broadband diffusion and identifies constructs for empirical investigations.

The **second section**, *The Methodological Underpinning*, primarily focuses upon determining the appropriate research approach employed to undertake this research. This section also describes the development of the survey instrument employed for data collection. Section II consists of the following three chapters: Chapter 3 *Research Methodology*; Chapter 4 *Development of Survey Instrument: Exploratory Survey and Content Validity*; and Chapter 5 *Development of Survey Instrument*. Although section II provides useful readings for all potential readers, it is particularly useful for audiences such as marketing professionals from broadband service providers industry, academics, researchers and students.

**Chapter 3** aims to discuss research approaches in general and those specific to this research. It also provides the justification for the chosen research methodology, as well as detailed discussions on the specific methodological approach employed.

**Chapter 4** aims to describe the development of a research instrument that is designed to investigate broadband adoption, usage and impact within UK households. The chapter describes the following three stages of developing a reliable research instrument: (1) identification of the factors from the literature that are expected to explain the broadband adoption behaviour and determining them by employing an exploratory survey; (2) content validation on items that result from the exploratory survey, the purpose of this step being to confirm the representativeness of items to a particular construct domain; and (3) a description of a pre-test and a pilot-test in order to confirm the reliability of measures.

**Chapter 5** presents findings obtained from a confirmatory survey that was conducted in order to examine the adoption, usage and impact of broadband in UK households. The chapter provides an illustration and discussion of the estimation of response rates, non-response bias, reliability, construct validity and the effect of ordering questionnaire items. This chapter first discusses the appropriateness of response rates and issues of the non-response bias of the survey in light of existing work. Then it discusses the instrument validation process by reflecting upon issues such as content validity, reliability and construct validity.

The third section, *The Empirical Underpinning*, provides the fruit of this research monograph. This section presents and illustrates the findings obtained from confirmatory survey data collection before reflecting upon these findings. Section III consists of the following three chapters: Chapter 6 *Empirical Findings*; Chapter 7 *Comparing the Current and Future Use of Electronic Services* and Chapter 8 *Reflecting Upon the Empirical Findings*. Section III is recommended as being essential and useful reading for all potential readers.

**Chapter 6** presents the findings obtained from the survey that was conducted to examine the adoption, usage and impact of broadband in UK households. An illustration of these findings comprises of descriptive statistics, differences between the adopters and non-adopters of broadband, demographic differences and regression analysis. This chapter also presents findings related to the usage of broadband and its effects on consumers' time allocation patterns on various daily life activities.

**Chapter 7** illustrates the adoption and use of 41 online services belonging to seven different categories which were included to examine the current and future use at home and in the work place in the UK. These seven categories comprised communications (five online services), information seeking (seven online services), information producing (four online services), downloading (six services), media streaming (five services), e-commerce (eight services), and other activities that included entertainment activities (four services), social and personal (two services) and e-government.

**Chapter 8** discusses and reflects upon the findings obtained in Chapters 6 and 7 from the theoretical perspectives presented in Chapter 2. It also discusses the empirical issues that have been reported from the survey findings. This chapter first discusses the refined and validated model of broadband adoption. Finally, the chapter provides a discussion on the usage of broadband and how it affects consumers' time allocation patterns on various daily life activities.

Finally, the **fourth section**, *The Emerging Issues*, explores some upcoming issues critical to the area of broadband adoption, usage and impact and also concludes the UK case study. Chapter 9 explores the role of broadband adoption and socio-economic characteristics in the diffusion of emerging e-Government services. Elizabeth Enabulele and Gheorghita Ghinea (Brunel University, UK) present a critical topic entitled *Broadband Quality Regulation* (Chapter 10). Finally, Chapter 11 *Conclusions*, formulates the conclusions of the UK case study and provides a discussion

on the contributions of this research, as well as its limitations and future research directions. Section IV is also recommended as being essential and useful reading for all potential readers.

**Chapter 9** examines citizens' awareness and adoption of e-Government initiatives, specifically the 'Government Gateway' in the United Kingdom. Since these services have been recently introduced, an investigation was needed to study if the demographic characteristics and home internet access are affecting the awareness and adoption of these services. Therefore, the second aim of this chapter was to examine the effect of citizens' demographic characteristics and home broadband access on the awareness and adoption of e-Government services. To fulfil the specified aims, this study undertook an empirical examination of the awareness and adoption of the 'Government Gateway' amongst UK citizens.

Finally, **Chapter 10** emphasises the fact that in the rush to achieve market share, insufficient attention has been paid to quality issues, which forms the central theme of the chapter. Indeed the concept of quality is a multi-faceted one, for which various perspectives can be distinguished. The chapter explores broadband quality as perceived by users in the UK and reports the results of a survey, which determined the users' perception on broadband quality. The results of the survey show that quality, although desired by many, has been neglected in favor of the desire to have access to the Internet via broadband at the lowest cost possible. However, this has not encouraged some consumers to take on broadband access despite some low prices offered by service providers, as these low prices for broadband access is not commensurate to their needs.

**Chapter 11** summarises the research findings and provides a discussion of the research contributions and implications of this research in terms of the theory, policy and practice. This chapter also delineates the research limitations and presents future research directions in the area of broadband diffusion and adoption.

**Division 2**, entitled *The Dutch Case Study*, examines the consumer adoption, usage and impact of broadband in the Netherlands. Division II consists of two chapters. Karianne Vermaas and Lidwien van de Wijngaert (Utrecht University in the Netherlands) present research outcomes from a longitudinal study on consumer/user adoption and usage of broadband in the Netherlands (Chapter 12). In Chapter 13, Karianne Vermaas and Sven Maltha (Dialogic Innovation and Interaction in the Netherlands) report on current usage, experiences and thresholds of Broadband in Dutch education. Division II is also recommended as essential and useful reading for all potential readers. A more detailed description of Chapters 12 and 13 is provided below:

**Chapter 12** investigates the central research question: How do Dutch internet users with a broadband connection differ from people with a narrowband connection in terms of demographics (age, gender, education), internet experience (experience, frequency, intensity of use), expectations (of narrowband users), experiences (of broadband users), annoyances and patterns of internet usage? This chapter also ad-

dresses the question of whether and how these differences change over time. The chapter uses a model of technology adoption and use that is built upon different theories such as diffusion of innovations, uses and gratifications, and media choice theory.

**Chapter 13** explores the impact of broadband on the following aspects of education from a user perspective: (1) to what extent broadband is used in Dutch education (in the class room as well as in the organisation as a whole) and (2) the experiences that teachers have with broadband, including impediments and added value. This issue was investigated employing a survey data collection from 221 Dutch teachers, ICT-coordinators and school boards. The results show that teachers, ICT coordinators and school boards are interested in using broadband in their schools as they see the added value, but there seems to be an impasse: without infrastructure, there are no services and without services there is no need for infrastructure. Schools can break out of the causality dilemma by giving an impulse to the market by combining forces and demand. Moreover, teachers need to be trained in using the new tools and service.

**Division 3**, entitled *Developing Country Perspectives and Implications*, examines consumer adoption of broadband in the developing countries of Bangladesh and the Kingdom of Saudi Arabia (KSA). This division also discusses the further implications of the findings and future trends in the area of adoption and diffusion of broadband. Division III provides essential readings for all potential readers, particularly for audiences from developing countries such as marketing professionals from broadband service providers industry, academics, researchers and students. This division is further organised into two chapters as described below:

**Chapter 14** examines the factors affecting the adoption of broadband in two developing countries, namely, Bangladesh and the Kingdom of the Saudi Arabia. This chapter undertook an empirical examination using a survey approach for examining the adoption of broadband.

Finally, **Chapter 15** presents implications of the research presented in this book and outlines the future research trends in the area of adoption and diffusion of broadband. The findings of the research detailed in this book generate a number of implications that may be relevant to policy makers, ISPs and other relevant stakeholders for increasing consumer adoption of broadband.

This book provides exhaustive coverage on a particular research issue and the author hopes that this will provide a positive contribution to the area of information systems in general and, specifically, to the adoption and diffusion of broadband amongst consumers.

However, in order to make further research progress and improvement in the area of adoption and diffusion of broadband and other consumer technologies, I would like to welcome feedback and comments about this book from readers. Comments and constructive suggestions can be sent to me care of Idea Group Inc. at the ad-

dress provided at the beginning of the book, or by electronic mail to: ykdwivedi@gmail.com.

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*May 2007*

## **Endnote**

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- <sup>1</sup> Organisation for Economic Cooperation and Development, OECD Broadband Statistics, June 2005, [http://www.oecd.org/document/16/0,2340,en\\_2649\\_34225\\_35526608\\_1\\_1\\_1\\_1,00.html#data2004](http://www.oecd.org/document/16/0,2340,en_2649_34225_35526608_1_1_1_1,00.html#data2004)