



# Interactive Television: A Study into the Diffusion of a New Technology in Britain and Ireland

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## ABSTRACT

This research involved a study of the diffusion of Interactive television in Ireland and the United Kingdom, in order to assess the current level of diffusion of Interactive Television services as well as analysing the potential links with Rogers's (1983) diffusion of innovations study. The research involved a series of semi-structured interviews with key individuals involved in Government, Communications Regulation and the Public Service Broadcaster in both countries. The interviews found that interactive features were not seen as the key driver for consumers moving to interactive digital television, but that they do improve the 'stickiness' of a channel. Choice and improved quality were the main reasons to move to the new technology. The interview results suggested that it was important to change the focus of the digital offering as it proceeds through the product life cycle to appeal to the relevant adoption group from the Rogers (1983) diffusion of innovation model.

## INTRODUCTION

TV is one of the most watched media around the world, with more than 98% of households in the UK possessing at least one television set (eEnvoy, 2003). Over the last decade television has begun the move towards digital broadcasting as transmission of television signals uses digital rather than conventional analogue methods. Digital television offers the prospect of various advanced interactive services like shopping, games, banking and accessing government services. Given that these new services are of interest to various stakeholders like citizens, broadcasters, software companies and government, the ability to drive forward the diffusion of such a technology can help to improve the quality of service provided and offer new ways to reach individuals. The Irish and UK governments are currently faced with the challenge of the digital transition. During the move to digital television, governments must try to ensure that their respective citizens will be able to access their public service broadcasting channels on a free to air basis via digital transmission networks. The purpose of this paper is to examine the diffusion of digital television and interactive services in Ireland and the UK. The research also aims to identify some of the factors that will affect the adoption rate of interactive television and also gauge what the future holds for public service broadcasting in the digital multi-channel environment.

## INNOVATION AND NEW TECHNOLOGY

The development of a new technology can be viewed from two perspectives: either as a gradual, incremental change or as a rapid discontinuous change (Adner and Levinthal, 2002). Doraszelski (2004) suggests that a technological breakthrough ('innovation') triggers a myriad of small refinements ('improvements') that enhance the efficiency of the basic technology. This 'innovation' could be compared to the rapid change suggested above while the subsequent improvements could constitute the gradual changes that then follow. (Lee and Lee,

1995) argue that consumers dictate the uptake of the technology emphasising the importance of studies, particularly in marketing circles, into the adoption of new technology to try to provide a better understanding of the issue.

## The Product Life Cycle

The Product Life Cycle is used to describe the evolution of a product by measuring its sales over time. At any point in time a product can be located within one of four life-cycle stages – Introduction, Growth, Maturity or Decline (Cox Jr, 1967). Research carried out by Pammer et al. (2000) on the ability to forecast the penetration of a new product used the example of the move from black and white to colour television. The researchers felt it was reasonable to assume that the colour television penetration rate would follow an S shaped curve (similar to that seen in the product life cycle) just like its black and white predecessor. If the same assumption would turn out to be true for the move from analogue to digital television with interactive services, it may be possible to pinpoint the stage in the life cycle and target the market with effective advertising accordingly. The challenge for a marketer however remains, how to target the type of customer who would purchase given the current stage of the product life cycle?

## The Role of Advertising

When attempting to draw an individual into purchasing a technology product the marketer is faced with additional issues not associated with a simple commodity purchase. The average purchaser of a high technology product may have their decision influenced by one or more technological fears, which can act as a barrier to such a purchase (Higgins and Shanklin, 1992). Such fears include technical complexity, rapid obsolescence, social rejection and social harm. Higgins and Shanklin (1992) found that the most widespread concern was of technical complexity but that the more experience a person had with high-technology products, the less they would fear them.

## Diffusion of Innovation

Diffusion theory provides a systematic demand side explanation of how new innovative technologies are communicated, evaluated, adopted, and re-evaluated by consumers (Kang, 2002). Given the costs involved in developing a new technology, being able to segment the various potential buyers and target them as the product is rolled out can contribute to its success. Rogers' Diffusion of Innovation Theory has been previously cited as one such framework for innovation adoption, involving five stages: innovators, early adopters, the early majority, the late majority, and laggards (Kang, 2002, Cheng et al., 2004, Martinez et al., 1998, Chaudhuri, 1994). Rogers (1983, p. 3) defines diffusion as involving an innovation, which will have to be communicated, over a period of time among members of a social system.

Table 1. Combining the Diffusion of Innovation and Product Life Cycle

Combining the Diffusion of Innovation and Product Life Cycle Models					
Diffusion Stage	Innovator	Early Adopter	Early Majority	Late Majority	Laggard
Diffusion Rate	2.5%	13.5%	34%	34%	16%
Life Cycle Stage	Introduction	Introduction	Growth	Maturity	Decline

By combining the Product Life Cycle and Rogers Diffusion of Innovation model it may be possible to assume that the five levels of innovativeness suggested by Rogers (1983) have a relationship with the four stages of the Product Life Cycle. The table below uses the stages of the Product Life Cycle (Introduction, Growth, Maturity and Decline) and affixing the stages as weighted by Rogers to illustrate this potential relationship.

The relationship between the Product Life Cycle and the Rogers model could provide marketers and product creators with the information to target the correct segment of the market where necessary. Interactive Television – an Innovative Technology

Interactive Television has developed in parallel with the move towards convergence of technology. Although the basic characteristics of television may remain, technological convergence has made it feasible for new, interactive, multimedia services such as video on demand, tele-shopping, tele-banking, tele-medicine and interactive games (Blackman, 1998). This would suggest that Digital Television and interactive television would constitute a complementary convergence, where resources and competencies from different industries are combined to form new functions that complement existing ones (Chan-Olmsted and Kang, 2003). Digital interactive television can be delivered in one of four ways; cable, satellite, terrestrial and DSL (digital subscriber line).

### Benefits of Interactive Television

Digital Television (DTV) offers many benefits to users, service providers, advertisers and the government. Digital transmission moves the TV experience towards personalisation where specific information and services can be selected by the viewer (eEnvoy, 2003). The technology itself can also aid the service providers, who can tailor their offers precisely by collecting detailed data about the way customers use the medium (Maude et al., 2000). The data that can be provided relating to viewing habits can be of immense value to broadcasters and marketers (Hanley and Viney, 2001). DTV potentially provides a means for Government to reach virtually the entire population, giving people a new way of accessing government services, taking advantage of all the features of DTV to blend rich information content with interactivity. (eEnvoy, 2003).

With the increasing demand on broadcast spectrum, Digital Television offers excellent transmission efficiency. DTV typically supports up to six digital TV channels in the same 'bandwidth' (broadcast spectrum or frequency) that would be required for a single analogue channel. This allows the delivery of many more channels and programme services (eEnvoy, 2003; Blackman, 1998). The greatest strategic benefit Digital Television has to offer is interactivity. Interactive viewers will still use the TV mainly for passive, 'lean back' viewing, but they will also become accustomed to using the 'lean forward', interactive features. (Blackman, 1998). Many interactive services exist including services to provide television banking (Orange, 2003; Maude et al., 2000), home shopping, which is often referred to as T-Shopping (Wade and Mckechnie, 1999), delivery of university courses (Seay et al., 2001). If this technology were to be adopted by a significant amount of current television owners (99% household penetration in the UK (Maude et al., 2000)) then it would be able to provide such services to a greater number of people than the internet currently can (53% household penetration in the UK (Ofcom., 2004)) and through a medium that more people would already be familiar and comfortable with.

## RESEARCH METHOD

This paper examines Interactive TV as a Diffusing Innovation by studying the current diffusion in two contrasting countries. The authors conducted semi-structured interviews to examine the role of government and Public Service Broadcasters in the diffusion process. By conducting a comparative study it was possible to compare Ireland and the United Kingdom on a range of issues including, the stage of diffusion development, initiatives in place to accelerate diffusion and assessing the role of Public Service Broadcasting. Six interviews from the two chosen countries provided the authors an insight into two differing stages of the diffusion of interactive television. The UK has significantly higher penetration of digital television that offers interactive services and interviews were conducted with officials from the Department of Trade and Industry (DTI) as well as the national public service broadcaster, the BBC. By conducting interviews with similar figures from the Irish perspective (namely the Department of Communications and RTÉ, the public service broadcaster), the research was able to draw comparisons and contrasts between the countries. Additional interviews were also carried out with staff of the communications regulators in both countries in relation to the development of this technology and its implications for regulation.

## FINDINGS

### Transition to Digital Television

#### *The Irish View*

Only one of the three interviewees felt that fear of moving from analogue to digital television could be an issue. The interviewee did however point out that some of the consumer research carried out by their organisation had highlighted cost and lack of perceived need as the main reasons for not going digital. Overall the interviewees felt that fear wouldn't be a serious issue.

When asked about what steps should be taken to minimise the issue of fear of moving to digital television, all three interviewees felt that there would be a need for extensive information campaigns. All three interviewees pointed out that they would have a role in the education of users closer to a date for digital switchover, but they also highlighted how each role would be different including using broadcast channels to educate consumers, running education campaigns, or ensuring that equipment retailer provide clear and good information to consumers. All three of the interviewees felt that there was some scope for interactive television to address the issue of reducing the digital divide. It was however pointed out that the nature of the interactive television services would dictate the ability of iTV to address the issue. Another of the interviewees raised the issue of convergence and felt that as the television evolves it will in fact be more like a PC as it relies on Internet protocol technologies more and more to deliver its services.

#### *The United Kingdom View*

Two of the three interviewees felt that there was some element of fear in relation to moving from analogue to digital television. Minority groups like elderly people and people with disabilities were cited as examples. Two of the interviewees pointed out that considerable marketing has been done to promote the benefits and build awareness for Freeview, the UK Digital Terrestrial Television (DTT) Platform. In response to whether there was a need to offer incentives closer to an announcement on analogue switchoff, all three interviewees pointed towards this being an issue for the Government to make. Two of the interviewees highlighted the increasing penetration of digital television services (for the level of Freeview penetration and the Digital penetration overall). One interviewee suggested there might be a need to switch the focus of the benefits of Digital television and try a different strategy to target the last group who has yet to change over.

## Diffusion

### *The Irish View*

Two of the three interviewees believed that interactive television was an 'innovation' in relation to the development of television. The notion that iTV creates a different relationship, a different dynamic and a different business model for marketing and delivering content to individuals was raised. One interviewee felt that iTV was an 'improvement' as none of the services available were "too amazing" at the moment. All three of the interviewees believed that Ireland was at the introduction stage with regard to the use of interactive television services. Two of the interviewees suggested that as interactive television develops then it may be questionable if it can still be perceived as television. When asked what initiatives would or already have been put in place by their respective organisation to accelerate the diffusion of interactive television services one interviewee pointed out that a trial licence application process was recently launched for applicants wishing to trial new services, which includes the delivery of interactive services. Indirectly their market research also offers information to consumers and broadcasters as to the development of interactive television.

### *The United Kingdom View*

When asked if interactive television was an 'improvement' or an 'innovation' in relation to television development, two of the interviewees felt it was both. The third UK interviewee felt it was definitely an innovation as it "changes the relationship between content and the viewer. It changes the viewer from a 'viewer' to a 'user'." Two of the three interviewees stated that the use of interactive television based services was at the growth stage. In response to what initiatives are in place to accelerate the diffusion of interactive services two of the three interviewees pointed to the marketing of the benefits of interactivity. The BBCi red button services, was cited as a "leading edge" service and the BBC Interactive Media Player (iMP) was mentioned as an experiment that may accelerate diffusion. One interviewee felt that the convergence of technology would contribute to the diffusion of interactive services.

## Reasons Driving the Change to Digital & Interactive TV

### *The Irish View*

All three of the interviewees felt that the reasons people are moving to digital television with interactive services were choice and a perception of improved quality. Two of the interviewees questioned the fact that interactivity was a reason consumers were making the move, a suggestion that has been backed up by consumer research carried out by one of their organisations. It was also suggested by one interviewee that broadband wireless schemes and 3G (3<sup>rd</sup> generation mobile phone technology) might be more attractive for the fully interactive experience and therefore compete with interactive television.

Two of the interviewees pointed to the Electronic Programme Guide (EPG) being a useful tool, which can then lead the user into what the other interactive services are. The Personal Video Recorder (PVR) was also highlighted by two of the interviewees as a potential driver for the development of interactive services, although the fact that convergence would blur the broadcasting boundary was also raised. One interviewee added that the PVR could kill the old business model and will mean that advertisers will have to come up with other ways to reach its viewers.

### *The United Kingdom View*

Two of the three interviewees pointed to consumer choice (the increased number of channels and genres) as the main reason driving the move to digital television. The third interviewee felt that the 8-day Electronic Programme Guide (EPG) was a key innovation for digital television. All three interviewees saw interactivity as an add-on or a bonus but not a major driver or a significant reason to move to digital television. When asked whether all age groups will adopt interactive services, two of the

three interviewees felt that they would, with one interviewee stating that there was already good usage of the services across different age groups and demographics. Finding the right content was raised as an important way to draw in the user.

In response to which application the interviewees felt would drive the diffusion of interactive services, two of the interviewees stated that the EPG was one of the most important services. The Personal Video Recorder (PVR) was also cited as having the potential to drive interactive services. It was pointed out that owners of PVR's had quite different viewing habits when they get a PVR, with at least half their time spent watching items that they had recorded as opposed to looking at the live television programming.

## Public Service Broadcasting

### *The Irish View*

When asked about the role of Public Service Broadcasting (PSB) in the future multichannel environment, all three interviewees felt it would have a key role. One interviewee pointed to their need to educate and provide information up to the time of any digital switchover. Another interviewee stated that PSB was in a unique position, as it was not dictated by market and consumer forces like its commercial counterparts.

### *The United Kingdom View*

When asked about the role of Public Service Broadcasting in the multichannel environment two of the three interviewees felt Public Service Broadcasters would find it more challenging. One interviewee felt that they were responding to the new threats of the environment (potential to lose market share) by launching their own digital channels to get back their share. One of the interviewees looked at the new environment as more of an opportunity for Public Service Broadcasters, citing the ability to have channels dedicated to children or the arts. One interviewee stated that

## Interactive Television and the Internet

### *The Irish View*

Two of the three interviewees believe that interactive television would both complement and compete with the Internet. One of the interviewees pointed out that depending on where a person is or what they were doing they will use the appropriate platform to suit their content. Two of the interviewees raised the issue of convergence. Stating that the 'lines that are drawn will fade and blur and change' and that 'a fully converged world would see people accessing content over any platform, on to any device, anywhere, at any time'. The Irish interviewees were asked if legislation or regulation changes would be necessary to protect consumers while using advanced interactive TV services like banking or shopping. All three interviewees were of the belief that existing legislation and regulation provided a good degree of protection. It was pointed out that most of the new services would only prosper if they guarantee consumer confidence.

### *The United Kingdom View*

None of the three interviewees felt that Interactive TV was in competition with the Internet. One interviewee pointed out that audience research has shown that people do not see it (interactive services) as an 'either or' to the Internet. They use a different medium at different times according to what content or their needs state. When asked as to what Interactive service/product they felt would offer the highest level of competition to the Internet, the interviewees again did not feel there was any competition with the Internet. One interviewee felt that users would chose Interactive services because the content is different and the way they would be sitting in their home the expectation is different than that of the Internet.

## DISCUSSIONS AND CONCLUSIONS

This paper provides an insight into efforts by the Irish and UK governments to support the diffusion of Interactive Television. In terms of assessing the stage of diffusion based in Table 1, Ireland can be classified in the introduction stage, while the UK has entered the growth stage. According to Cox Jr. (1967) the majority of products follow a particular promotional strategy with little promotion in the introductory stage that then rises to a peak in the growth stage. This growth of promotion was cited in the UK interviews with the public service broadcaster extensively promoting its interactive services. The challenge for a country like Ireland will be to realise that the type of adopter changes as the life cycle stage changes. According to Table 1, Ireland should now be targeting the early adopter and then early majority classifications of Rogers's (1983) diffusion model. The early adopter category is important as they are often considered to be opinion leaders. This means that by successfully getting this category to take-up the technology they will in turn influence other individuals' attitudes and potentially increase the diffusion of the product (Rogers, 1983).

### Innovation Diffusion

Many of the statements made in the interviews support the work of Rogers (1983) and confirmed that by understanding the diffusion of innovation concept, it can be possible to focus the offering and improve take up. The interviewees pointed out how it was important to change the focus as they moved through the diffusion process and along the curve of the Product Life Cycle in order to target the different user groups who fall within the five categories put forward by Rogers (1983).

The interviewees did not entirely support the suggestion that Digital Interactive television was actually an innovation. Although those that did feel the technology was innovative felt so due to the fact that interactive services change the relationship for a consumer turning them from a viewer of TV to a user. Further convergence in the broadcasting sector in the future may see more innovative offerings, which combine traditional Computing Technology, Internet Protocol Services and Broadcasting into a radical home entertainment experience that truly epitomises the notion of innovation. From the interviews, it is clear that interactive features are not the key driver for consumers moving to digital television but that these services have the potential to improve the 'stickiness' of a channel and therefore have good commercial prospects. The results of the interviews did suggest that choice on digital television with interactive services was a key reason for change, with five of the six interviewees expressing this feeling. The perception of this technology having improved quality was also seen as a factor for consumers who make the change.

### Lessons Learned

Ireland is in a good position to learn valuable lessons from the UK in the area of broadcasting. The UK experiences suggest that a company charged with the task of informing consumers about digital television and switchover can reduce fears associated with making the move. This may be an option when Ireland moves closer to this stage. Ireland may also learn from the experience in the UK in developing a successful DTT platform, which has had a key role in the development of digital television and interactive services in the UK. It is clear from the interviews that the Irish representatives are wholly aware that they have a key role in the future development of Digital television and Interactive services. The recently announced Digital Terrestrial Television pilot should be a welcome step for the Government, Communications Regulator and the Public Service Broadcaster to drive an already successful diffusion of digital television. Driving the interactive services element however may involve more interaction with broadcasters and software providers. The Government must also take full advantage of using this medium, which has such a high penetration in Irish homes to deliver government service like those tested in the UK.

### The Future of Public Service Broadcasting (PSB)

It is clear that public service broadcasting will face increased challenges in its future. In the future, aspects of the Public Service Broadcaster may change in a similar fashion to the UK, which has seen it develop additional niche channels to hold onto market share. However, the all encompassing offering that only PSB can provide coupled with its core funding coming from citizen licence fee payments could in fact be its saving grace. As more channels become niche channels, the demand for a citizen focused channel offering broad output should stay strong.

The research suggests that Interactive features are not the key driver for consumers moving to digital television but that these services have the potential to improve the 'stickiness' of a channel. The results of the interviews did suggest that choice on digital television with interactive services was a key reason for change, with improved quality also seen as a factor for consumers who make the change.

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