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**The Use of Information and
Communication Technologies
in the Home**

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Keywords

Information Communication Technologies, Use, Australia, Information, money, online

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THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN THE HOME

Part I Key Findings

This report centres on three main questions. They are:

- How do people use Information and Communication Technologies (ICTs) in the home?
- What factors influence decisions to purchase or not to purchase ICTs for the home?
- What factors impact on people's use of online services?

Starting from the users' perspectives, we conducted open-ended interviews with 52 persons from 24 households in Victoria, Australia. We analysed this data with the help of a computer programme for qualitative research. This helped discover the questions and issues important for the residential consumers. We found that:

1. Users focus on activities not technology

Users place their own activities at the centre of analysis, seeing the greater functionality of ICTs as increasing their options to mix and match different ways of doing the meaningful things in their lives. This contrasts strongly with the approach of suppliers and industry, who place ICTs at the centre of their questioning and analysis. This has led them to presume that new ICTs and online services will displace older ways of doing things. Some anticipate that there will be a centralised multifunctional ICT capable of fulfilling all the users' needs. Our research shows that users adopt ICTs selectively to supplement existing ways of acting. This leads to a greater diversity in the way ICTs are used, rather than centralisation.

2. ICTs are located according to the activities carried out in the different spaces of the home

ICTs are distributed in different spaces in the home to correspond with the meanings of activities that take place in these spaces. Our research shows that the key dimensions of activities and spaces are whether they are communal or personal; work or leisure.

- The primary telephone, television, video cassette recorder and stereo are placed in communal leisure spaces such as the living room, dining room or lounge, as they are primarily seen as communal leisure ICTs.
- The primary personal computer (PC) is nearly always located in personal work areas, as it is predominantly used for work or study. The secondary PCs show a more diverse pattern depending on the availability of additional personal work areas; the household

composition; and the growing importance of using the PC as an entertainment and communication medium.

3. There is a hierarchy of ICT usage

There is a hierarchy of ICT usage, when multiple ICTs are used simultaneously.

- In communal areas, where there are multiple users and ICTs, the music on the stereo is switched off to give way to the television. The video cassette recorder (VCR) is preferred over the TV. Watching the VCR is also not accompanied by other activities.
- In personal areas, where a person is using multiple ICTs for a number of activities simultaneously, the stereo or the CD ROM when used for a music CD is the subordinate, background, aural, passive ICT. This is true when it is used together with the TV, or with the PC. When a person uses the PC and TV together, the TV is the subordinate, background, visual, passive activity with muffled sound.

4. Reasons for buying or not buying ICTs for home use

The main reasons for buying ICTs such as the answering machine, cordless or mobile phone, PC, fax/modem or connecting to the Internet are the work/study needs of persons in the home followed by the security/connection needs of dependants.

- The main reason for not buying these ICTs is that people do not see them as important for these needs.
- These needs underlie a person's assessment as to whether an ICT provides value for money. When it doesn't, then cost is most often cited as the most important reason for not purchasing an ICT with large initial costs, such as a PC, or with recurrent user costs, such as a mobile phone or Internet. However cost becomes a subsidiary consideration when the purchase can be justified by a work/study or a security/connection need. An entertainment need, such as with cable TV or video on demand is weighed up against the cost to ascertain whether a person is getting value for money.

5. Control of information about activities and transactions is a key determinant of ICT usage

Control of information is an important factor in deciding on the usage of ICTs and particularly of online transaction services. There needs to be a correspondence between the extent, immediacy, traceability and reliability of the information provided by the transaction service and the qualities of information needed for a particular activity. This is clearly seen in the way different forms of money are used for housekeeping expenses, business expenses, investment, tax, discretionary expenditure or gifts. That is why accessing information rather than conducting transactions remains the more routine online activity.

- The inability to control information prevents people from using online services that would allow them to control their time and space by allowing them to conduct transactions whenever and wherever they are.
- The preservation of social and cultural context is particularly important for activities like gaming and gambling and shopping, where the context adds to the entertainment dimension of the activity. A hesitancy to use these online services comes from a loss of this context.

6. Everyone expects greater ICT usage in the future, but reactions vary from enthusiasm to pessimism

Perceptions of the future vary from doom and gloom, inertia to great enthusiasm for the social benefits of ICTs. Everybody sees a greater role for ICTs as inevitable. The PC particularly is seen as the way to access the online world. Those who use the Internet for email and information are the most enthusiastic about the future. Most of the women with children, are inclined to see themselves as passive observers rather than participants in this future. The teenagers who spoke of the future see the increased role of ICTs as inevitable, but they are also the ones who are most pessimistic about its repercussions.

Part II Central Questions

1. Introduction

There is little understanding of the use of information and communication technologies (ICTs) in the home. This is despite the need for such studies as important inputs into billion dollar investment decisions. Most studies have concentrated on the supply, price and underlying technology of ICTs. The limited social science studies of the usage of ICTs have provided a valuable counterpoint to this, but few of them connect up with the questions that are central for industry and government decision makers. This is because there is a mismatch between the questions, perspectives and methodological approaches of the service providers and social scientists (Singh, 1995a).

Service providers have focused on demand rather than use. For them, price and the extent of future markets are the most important dimensions of demand. They are intensely interested in various versions of the question: How much? How much revenue will these new services generate? At how much should the service be priced? How much is the demand? (See Bureau of Transport and Communication Economics, 1995; Lamberton, 1994). Hence their research has focused on these questions, starting from the products they offer, rather than placing their products in people's lives. For social scientists, consumption is a more meaningful concept than demand, though "relatively few empirical studies have explored people's everyday experiences of consumption" (Livingstone, 1992, p. 114). The limited studies of the consumption or use of ICTs have been directed towards what they reveal about the family, household, home, gender, social and personal meanings. They have more successfully started from the perspectives of the users, but have failed to relate the social and cultural meanings of ICTs to the issues of demand central for service providers.

In this report, we use the conceptual frameworks and methodological approaches of sociology, while addressing some of the key concerns of industry. We start with the users' perspective; conduct qualitative research on the use of ICTs in the home to discover the important questions for users; and interpret the significance of these findings for suppliers of ICTs to the home. We do this by interpreting demand as "use" rather than price. This bridges the gap between industry's understanding of demand as price and the sociological study of demand as consumption. We also link the sociological investigation of the way people use ICTs within the home to the reasons people give for buying or not buying "new" ICTs. This more directly connects with the supply of ICTs and leads to a grounded picture of the future mix and match of ICTs in the home. This picture is of the way people are most likely to work, communicate, play, buy and pay for things, rather than of the technological possibilities in the development of ICTs. The methodological underpinnings of the study are elaborated in Part III.

2. Central Questions

This report therefore centres on three main questions. They are:

- How do people use ICTs in the home?
- What factors influence decisions to purchase or not to purchase ICTs for the home?
- What factors impact on people's use of online services?

Our research is distinctive in that instead of focusing on one ICT such as the telephone, television or the personal computer, we deal with a wide range of ICTs in the home - the telephone - fixed, cordless, mobile - and the answering machine; the radio and stereo; the television and the video cassette recorder (VCR); and the personal computer and the fax/modem. We also deal with the use of Internet and the use of online services, focusing on home shopping, gaming and gambling, information services and transactions. This allows us to investigate their varying importance to individuals in the household, for different activities at different times.

We study usage by analysing the connection between users, activities, and the spatial location of ICTs. We asked:

- How do people define the meanings of spaces in the home?
- How do the meanings of different spaces influence the location of ICTs in the home?
- How do people simultaneously use multiple ICTs?
- How do people use different ICTs for the same activity?

These questions are addressed in Part IV.

The concentration on present usage led us back to the decisions to purchase or not purchase their "new" ICTs. The ICTs central to people's most recent purchase or non-purchase decisions most often were the answering machine, the cordless or mobile telephone, the personal computer or the fax modem. As people looked retrospectively at these decisions, and described present usage, we asked them to amplify their expectations of their future use of some of the online services currently being trialed or introduced in Australia. We focused on home shopping, online gaming and gambling, information services and Internet transactions.

Hence we asked:

- What are the reasons people give for purchasing and not purchasing ICTs?
- What factors influence their proposed usage of online services?
- What are people's perceptions of future ICTs?
- What messages can we extract from this for the supply of ICTs to the home?

These questions are addressed in Parts V and VI.

Part III Methodology

3. The Sample

The sample comprised 52 persons from 24 households. It was a theoretical sample designed to answer the initial questions of the study and understand the main issues relating to the use of ICTs. It was over-weighted for households who own a computer, a modem, and households with children. This also means that the majority of our households were middle-income with only twelve percent defined as low income.

Our emphasis on households with computers and modems was because we wanted to cover as great a mix of ICTs as possible. Ownership of a computer and a modem was particularly important, because it is an important mode of access to online services. The emphasis on households with children was because younger people's use of ICTs was of great interest as studies have shown that the younger users are more inclined to use "new" ICTs (Cooke & Robotham, 1995; Gillard et al, 1995a; Madden and Simpson, 1995).

This theoretical sample differs from a representative sample which is designed for generalising conclusions to the wider Australian population. It must however be noted here, that few samples are genuinely representative. Often when research groups conduct research on telecommunications, and claim to be representative of the whole population, they are actually only representative of the white, middle class population. Aboriginal people, non-English speaking background persons, people with disabilities, low income people, older people, rural and remote users, technologically advanced households and individuals, women and young people are often not adequately represented (Consumers Telecommunications Network, 1994).

The differences in the socio-economic characteristics of a possible representative sample and our theoretical sample are charted below in Table 1.

Table 1: Socio-Economic Characteristics of a Representative and Theoretical Sample for the Study of ICTs in Australia

Socio-economic characteristics	Representative sample	Theoretical sample (N=24)	
		%	No. of households
Household ownership of PCs			
Have Pcs	20 - 40%*	92%	22
One PC			7
Two Pcs			9
More than 2pcs			4
Number of Pcs unknown			2
Household ownership of modems	6% b	58%	14
Household composition			
Single	9% ^a	8%	2
Couple only	11% ^a	21%	5
Couple with child/children	19% ^a	54%	13
Single with child/children	4% ^a	17%	4
Households with teenagers		33%	8
Rural	14.6% ^c	12.5%	3
NESB	25% ^{**}	12.5%	3
Low income households (under \$30,000)	33% ^d	12.5%	3

Sources: * ABS, 1994 puts it at 20%; Gillard et al, 1995a at 38%; Keig & Co, 1995 at 40%

** Shoebridge, 1995, p. 50. Includes households where English is not the primary language.

^a ABS, 1993

^b Keig & Co, 1995, p. 5

^c Macdonald, 1994, p. 82. Includes localities with a population between 900 and 999 persons

^d Griff, 1994, p.19. Specific cut-off figures for low income are below \$23,000 per annum for a sole parent family and approximately the same for a childless couple. We have adjusted the figure for larger families and to account for coding of income.

4. Methodological Framework

This study adopts the users' perspective, starting from the questions important to users, rather than the questions asked by providers. Its main data collecting method was the open-ended interview. We personally conducted the interviews between March 1995 and February 1996. Collaborative work required that we have an agreed demographic survey and interview outline as a starting point. This interview guide however went through continual change as our frameworks and questions changed. The persons interviewed have been sought through convenience sampling methods, while ensuring there were multiple starting points from the personal and professional networks of the researchers at CIRCIT and through accessing the trial sample made available by Telstra after their Power Touch Phone trial. The data were analysed with the help of NUD•IST (Non-numerical Unstructured Data Indexing Searching Theorizing), a computer programme for the analysis of qualitative data. This process of data analysis is discussed in greater detail in Singh (forthcoming b).

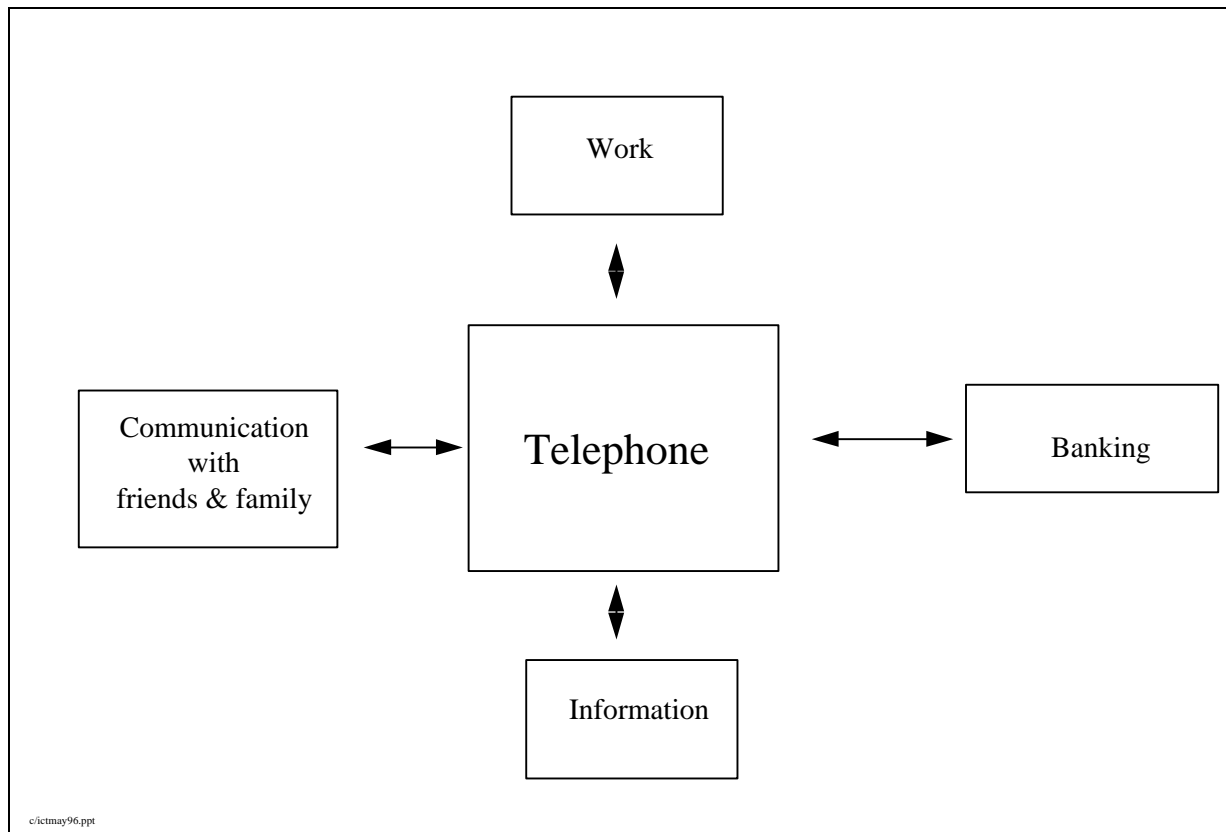
One of the main outputs of this work is to identify the questions and issues which are important to users rather than test the success of industry products and services. This approach has led us to new ways of studying the use of ICTs in the home, by replacing the ICT centred approach with the Activities centred approach; and by identifying different dimensions of ICTs and activities that are important in different contexts for users.

4.1 The Activities Framework for the Study of ICTs

At the beginning of the study, we asked users whether they had a particular ICT and where it was located in the house, and then progressed to questions of usage and meaning. It led us to placing the ICT at the centre of our questioning and analysis. Figure 1 illustrates this initial approach in the case of the telephone, which we saw as central to many different activities, among which are work, communicating with friends and family, gathering information and banking.

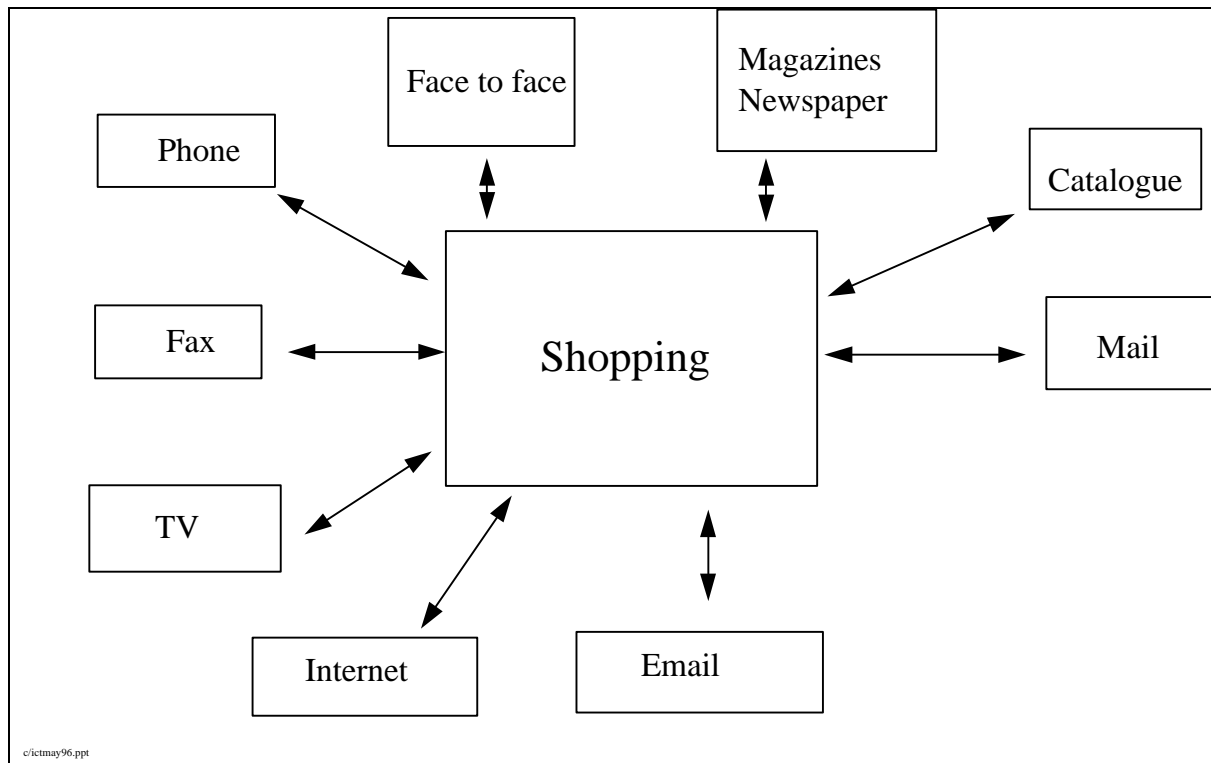
This ICT centred approach fits in well with a view of the world where ICTs play an increasingly important role, and one where new ICTs are likely to displace older ICTs. This view underpins many of the provider based scenarios of the future. However, our analysis of data about space and ICTs showed that it was the users' activities that gave meaning to both the ICTs and the spaces in the home. If the users' activity was placed at the centre, then the thrust of the questions and possible conclusions from the data changed visibly. This is illustrated in Figure 2, which takes shopping as the activity, and notes some of the different ways this is conducted.

Figure 1: ICT Centred Approach



When we placed users' activities at the centre of the analysis, then ICTs were revealed as only one of the ways people sought information about an activity or performed the activity within a given socio-cultural context. In Figure 2 for instance, a person can seek information about buying goods and services; order the goods and services; receive or obtain them; pay for them in any number of different ways. One can get information about goods and services from friends and family over the phone or face to face, or learn of it through the newspaper, catalogue or television; order it over the phone, in person or over Internet; pay for it in person, by mail, fax, phone or Internet. These options to mix and match different ways of performing different aspects of an activity have been traditionally present, though ICTs are now increasing the possible options.

Figure 2: Activity Centred Approach



The different dimensions of activities are matched by the various roles of ICTs. Taking the telephone as an example, one can use the telephone as one of the means of communicating with friends and family. It is also a different medium of communication compared to face to face communication or the mail. At another level, telephoning becomes more than a means or a medium of an activity - it becomes an activity in itself. Telephoning, watching TV, listening to the radio, wordprocessing, surfing the Internet are activities in themselves, as well as being the means and/or medium for the performance of different activities. This led us to keep in mind how the different dimensions of ICTs and Activities related to each other within the socio-cultural context.

Figure 3: Dimensions of ICTs and Activities

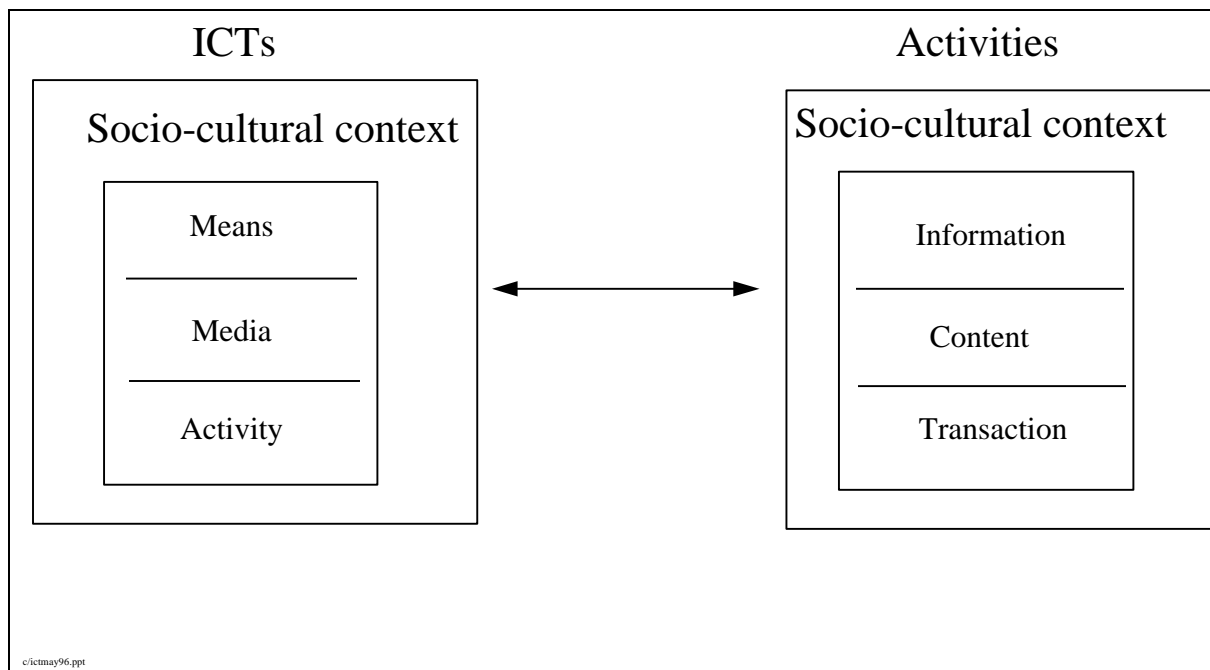


Figure 3 is an 'ideal type' of the different dimensions of ICTs and activities and does not encompass all the particular variations. For instance, with an activity like banking, the transaction is the content, whereas with education, one can more easily separate information about courses offered from the actual course and then from the payment for the course. The transaction element can in activities like shopping be further usefully distinguished into the order and purchase aspect of the transaction. Notwithstanding these points, identifying the different aspects of ICTs and activities was useful when analysing the way people mixed and matched ICTs while performing an activity or used different ICTs while performing more than one activity at the same time.

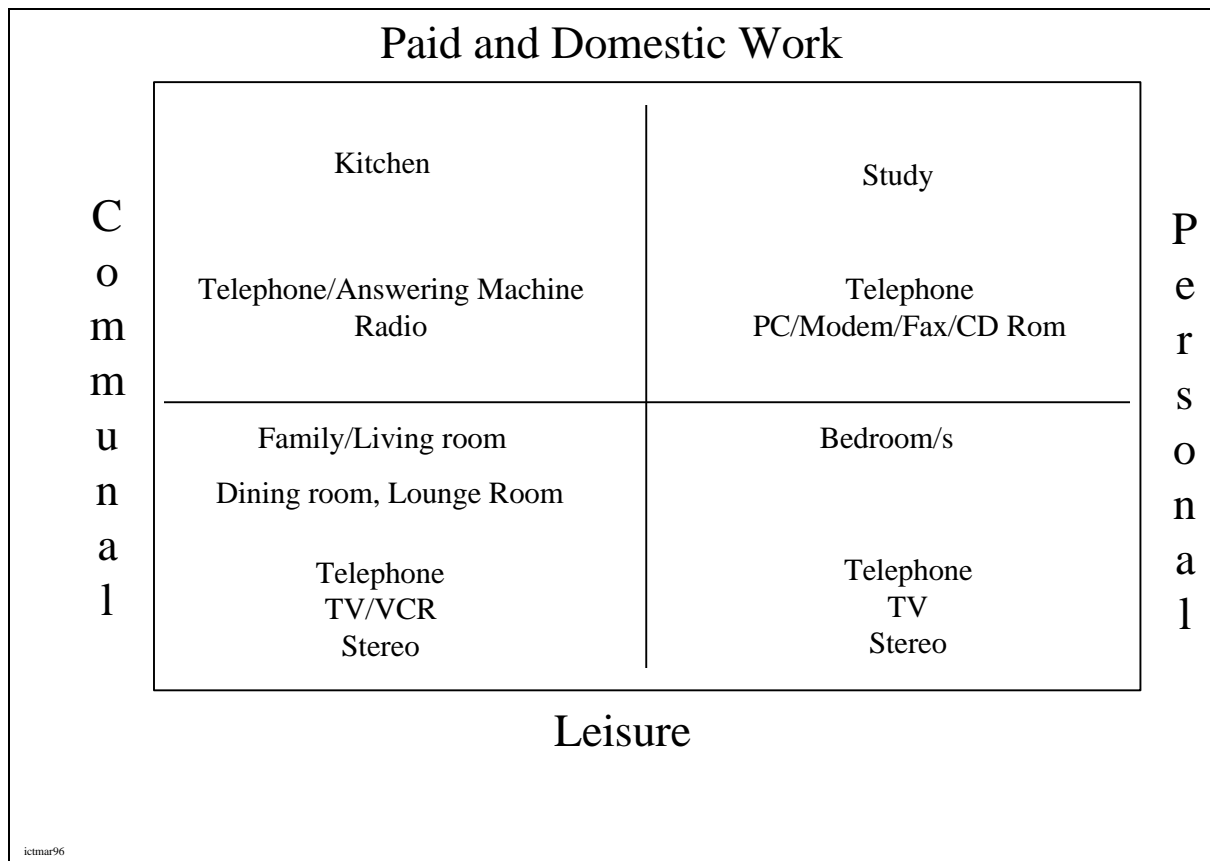
The users' perspective thus led to different questions which in turn led to conclusions which pointed to the way people used ICTs to give them different options to do what they wanted to do.

Part IV Space, Activities and the Meaning of ICTs

5. The Meaning of Spaces and Activities in the Home

Different spaces in the home have different social meanings, according to the activities associated with those spaces. These are along two axes: communal and personal; work (paid and unpaid including domestic work and study), and leisure (See Figure 4). This is an ideal type representation, as each home presents different variations and combinations of meanings of activities and spaces.

Figure 4: Space and ICTs in the Home



A communal space is one in which all members of the house have access, for example the kitchen, family room/living room, dining room, lounge. A personalised space is one in which there are restrictions on others using the space, as with bedrooms or the study. A space is defined as communal or personal depending on the kinds of activities which occur in it. Communal spaces commonly have activities that are done communally, such as watching television, or involve multiple users involved in different activities. For instance, one person may read the newspaper or iron clothes, whilst another watches television. Personalised spaces commonly have activities in which only one person is involved. Using the computer in the study, or listening to music in the bedroom are examples of such activities. Because of the activities, even within the communal/personal classification, some spaces are more personal or more communal than others.

Sometimes, a space has more than one meaning. For instance, kitchens are where the cooking is done and so is often considered a venue for domestic work. In some households however, the kitchen is also a place where people come to chat, or the children play or do homework. However, it is the dominant activity which gives a place its primary meaning.

Spaces also do not hold those meanings permanently. Sometimes people may choose to alter the meaning for a period of time by activities which are not reflected in the dominant meaning of the space. For instance, if only one person is at home, a communal space such as the family room, could temporarily become a personalised space. If everyone gathers in the bedroom, then it is temporarily a communal space. When the studying is done in the bedroom, it becomes both a leisure and a work place. When a home is inhabited by only one person or a couple (partners, not flatmates) the divisions between communal and personalised spaces still exist but are less evident.

6. The Location and Meaning of ICTs in the Home

ICTs are located to correspond with the meanings of activities in the different spaces in the home. These are communal or personal, related to work or leisure. The location of the ICTs also depends on whether they are the primary or the secondary ICTs in the home; the availability of personal spaces; and the household composition. If there are multiple ICTs of one kind, the primary ICT is the one which is the newest, has the most capabilities, is the best or the most frequently used.

These social meanings of spaces in the home are so well understood, that when there is a mismatch between the meaning of the ICT and the social space, the ICT is relocated so that the meanings of the social spaces and the ICTs correspond. This is illustrated in Narelle and Neil's story below.

6.1 Narelle and Neil: The Baby, Space and ICTs

Narelle and Neil in their 30s are a married couple with an eight month old baby living in the inner suburbs of Melbourne. Narelle is pregnant. Neil works full-time in a jointly owned business and Narelle works part time in her own business as well as caring for their child Nicholas. Their story shows how spaces in the home change to suit the needs of one member

of the household. Their use of space in their home is organised around Nicholas' needs and that of their expected child. As the use of space changed, the ICTs were moved to fit the new meanings of this space.

They see their current study becoming Nicholas' bedroom when he is older. The lounge room will then most likely become the new study. At present the lounge room is a little used area which Narelle describes as "nothing, the dog's room". The family room is very much the communal area where Nicholas plays and Narelle does the domestic work.

When Narelle was pregnant with Nicholas, they bought a cordless phone so she wouldn't have to get up to answer it. After Nicholas was born, she found it extremely useful when she was breastfeeding. Now the predominant use of the cordless phone is to allow her to take calls outside while she is gardening. She also occasionally takes it into the study when she is using the computer for an extended period of time. The cordless phone's handset is actually located in the lounge room, but has been moved into the family room, the main communal area, via an extension cord which has been neatly stapled out of sight to the floor. This is still seen as unsightly. At night the cordless phone is left in its handset so that it is easy to locate when it rings and to recharge its batteries.

There is a second phone in the bedroom, beside the bed. They see it as a convenience to answer the phone when they are in bed. It is rarely used for making calls.

The television was previously in the lounge room but is currently in the family room. Neil describes the placement of the television as "oscillating". He says that it was moved into the family room because they had friends over to watch videos and there was more space than in the lounge room. Neil believes the television will be moved back to the lounge room, unless the lounge room is turned into a study.

Narelle says, "Neil felt that with the television out here it's too easy to just walk in and turn the tele on". She says that Neil is "mesmerised" by television and once it is on "he can't turn it off. Once he gets home, if it's on that's it". Neil says, "We would watch it less in the lounge room because you have to go in there to make the effort. Whereas you have it as the background if you're in the ...living room".

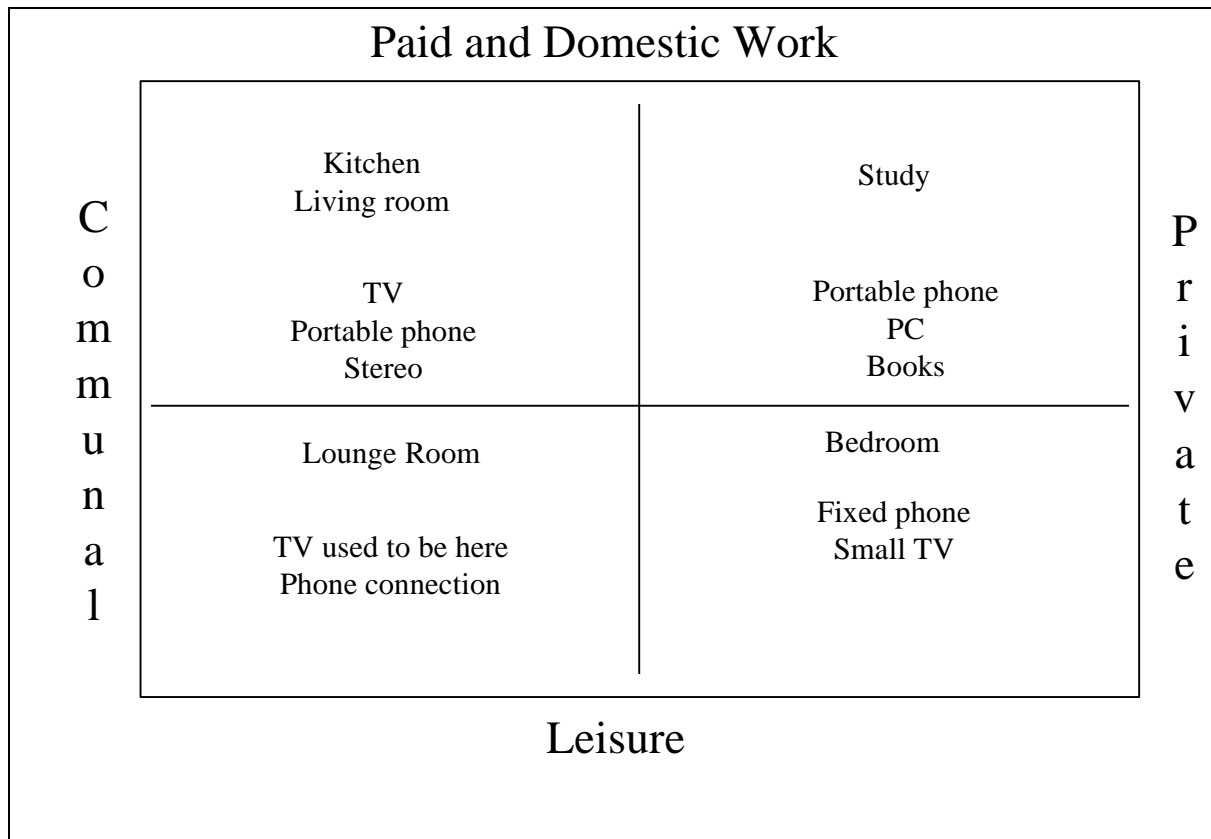
Narelle thinks that the television will remain in the family room now, because it is a baby proof space for Nicholas. She uses it to entertain Nicholas or to keep herself company while she is preparing dinner.

The second television is in the bedroom on a shelf in the cupboard, so that it can be hidden from sight. It is a small remote, portable television that was bought when Narelle became pregnant and found it uncomfortable to sit and watch television. Now it is used to entertain Nicholas whilst Narelle showers and gets ready in the mornings.

The computer is in the study so that it is away from the television set. Neil says it didn't work having them in the same room because you couldn't have them on simultaneously. When someone was "playing or doing something on the computer" and the other had the television on in the background, the person on the computer could not concentrate on what he or she was doing.

The stereo is in the living room and is used for background music. It is always on in their main living room area.

Figure 5: Space and ICTs in Narelle and Neil's home



6.2 The Primary Telephone, TV, VCR and Stereo are Communal ICTs

The primary telephone, television, video cassette recorder (VCR) and stereo are placed in communal leisure spaces such as the kitchen, living room, dining room or lounge.

The telephone is most often in the most central communal space which often is the kitchen or living room/dining room. This is also true of the base of the cordless phone, though the cordless phone itself is often associated with a person rather than a space. The TV, VCR and stereo are most likely to be in the lounge or living room. The second telephone is placed in personal areas such as the bedroom or study. Secondary televisions are often in less well-used communal spaces or personal spaces. In our sample, no household had more than one VCR.

When the only telephone is not centrally located in a communal space or a VCR is placed in a personal space, attempts are made to move the ICT to bring back a harmonious situation. In two households where the phone connection was not in a central communal area, an extension cord was used to bring it into the dining room. There was one household where the VCR used to be in the mother and stepfather's bedroom. The children saw it as a measure of control, as they had to ask for permission to go to the room and watch the VCR, even when the parents were not at home. As soon as the stepfather left the house (with his VCR), another VCR was bought, and it was placed in the lounge. The only exception to the "best" stereo being in the communal areas, is when children with an independent or alternative income have bought their own stereo, or parents have bought one for them. The "best" stereo may then be in their bedrooms rather than in the communal areas.

The use of the secondary telephone, TVs and stereos is different from that of the primary ICT. While the central telephone was used for communication in general, the secondary telephones were used for communication with privacy, comfort and/or convenience. For example, the phone is often placed in the bedroom for late night/early morning calls. Watching TV was seen as primarily a communal activity. Most parents we interviewed moderated or controlled the use of TV by their children, to some extent. The secondary TV tended not to get used unless there was a clash in tastes of programmes or the space was needed for another activity. The person with less control moved. Televisions in bedrooms were used occasionally for watching television whilst lying down, for watching programmes late at night or early in the morning. In one household the TV in the bedroom was used for falling asleep.

6.3 The PC is a Personal Work ICT

The PC differs from the telephone, TV, VCR and stereo in that the primary PC is located in personal work areas. The PC is seen as personal, as only one person can use it at any particular time. It holds personal information. It is also most often the most expensive ICT in the home. More than the telephone, the TV or the stereo, the PC is also regarded as complex by those who have yet to use it. At present personal work or study is the dominant activity associated with the PC, though this is supplemented by communication through email and entertainment with games and music.

The secondary PC is also often located in personal work areas, such as the bedroom or the second study. The location is influenced by the number of PCs. In the two households where there were more than three PCs, one of the secondary PCs was in a communal area. In one house it operated the printer to the local area network in the house, and in the other, it was an old PC sometimes used for games. But here too, the teenagers preferred the father's new Pentium in his study, while doing their work in the mother's office.

The location of the secondary PC is also influenced by the availability of secondary personal work space and household composition. In one of the three rural households, the secondary computer was in the dining room, with the primary one being in the father's study. The secondary one was used by the mother and the three children for work and games, with the children using the father's computer when the communal one was occupied. It has to be noted that there was only one study in the house, and the mother had previously used the laundry area or the kitchen for her computer work and study.

The personal work meaning of the PC is best illustrated by considering the exceptions. In five of the twenty-two houses with computers, the primary computer was not in a personal work area. None of these households had a designated personal work area. Even when they did have a spare bedroom, this was designated for other activities. In the absence of a study, in three households the PC was placed in the dining room and in the remaining two houses, the PC was in the lounge room. This lack of fit between the PC, a personal work ICT and the lounge/dining room areas which are communal leisure areas was solved in three households - those of Olivia, married with two children, Rachel, in her early 30s, married and expecting a child and Lisa, a single parent in her 40s - by changing the meaning -temporarily or permanently - of the lounge or dining room.

Olivia used the PC primarily for work, but in the absence of a study, took over the lounge room, converting it into a private work area. When the family wanted to watch the primary TV which was also in the lounge, then Olivia switched off the computer and the place again became a communal leisure space. Those rooms took on the dual meanings of study and lounge/dining room, though the meaning was sometimes more one than the other depending on the time of the day. The meanings of the computer however did not match the communal meaning of the space, as the computer was seen as a personal activity - with the exception of one household. Rachel and Ryan also doubled up the dining room as both a communal leisure and a personal work area. With their first baby due shortly, the spaces in their homes changed so that their study gave way to the nursery. Hence the computer moved from the study - now a nursery - into the dining room.

With Lisa, the lounge was transformed more permanently into her personal space. Lisa was a single parent, sharing the house with her son. There was no study in the house. The kitchen dining room area was the primary communal leisure/work area in the household, for Lisa had converted the lounge into her personal work/leisure area. Her son has his own PC.

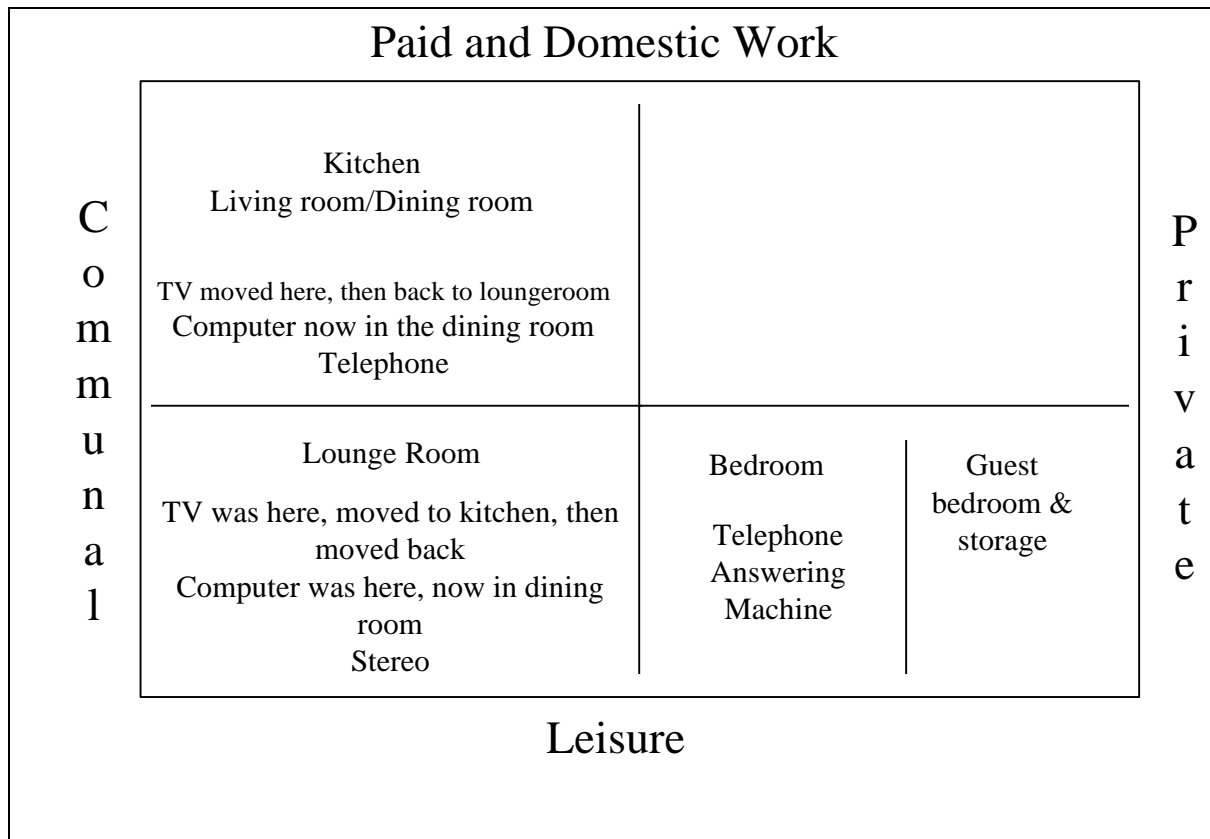
We now turn to a detailed examination of two of the houses where the primary PC is in a communal area. The first is that of Helen and Harry where the PC is in the dining room and they think there is a lack of fit. The second is that of Peter, Paul and Penny, where the PC is in a communal space, but where both the PC and the social spaces in the home have been redefined.

6.3.1 Helen and Harry: The Computer in the Dining Room

Helen, 28 and Harry, 31, live in a small, two bedroom unit in the eastern suburbs of Melbourne. Harry works as a trainer and manager of a gym and Helen works in the hospitality industry. They have no children. There is no study in their house. The second bedroom is used as a guest room and a storage area. Their story shows that when the individual meanings of ICTs and use clash with the available space, then the solutions remain unhappy and temporary. The tussle here is between Helen who enjoys watching television and is a timid user of the computer, and Harry who rarely watches television but uses the computer for work or playing games. He would like a private work space for the computer, but as there isn't one, this has meant an unhappy compromise in the positioning of the television and the computer.

Initially both the computer and the television were in the lounge room. But as Helen says, the computer was interfering with the television picture, so she moved the television to the kitchen. However only two persons could see the television here, so when they had a live-in guest, they moved the television back in the lounge room. Harry is however not satisfied with the positioning of the computer. He says he would prefer it to be in a separate study room where he would be free from interruptions in his work and the computer safe from food being dropped on it. He feels the space the computer is in could be better used for drying clothes as it is near the heater.

Figure 6 Space and ICTs in Helen and Harry's Home



They see that many of the problems around the location of the TV and the computer would be solved if they could separate the computer and place it in a private work space, and have another telephone there too. This would ensure that Helen and Harry could use the telephone as they saw fit, and that Harry would be able to quarantine himself away from the communal spaces in the house.

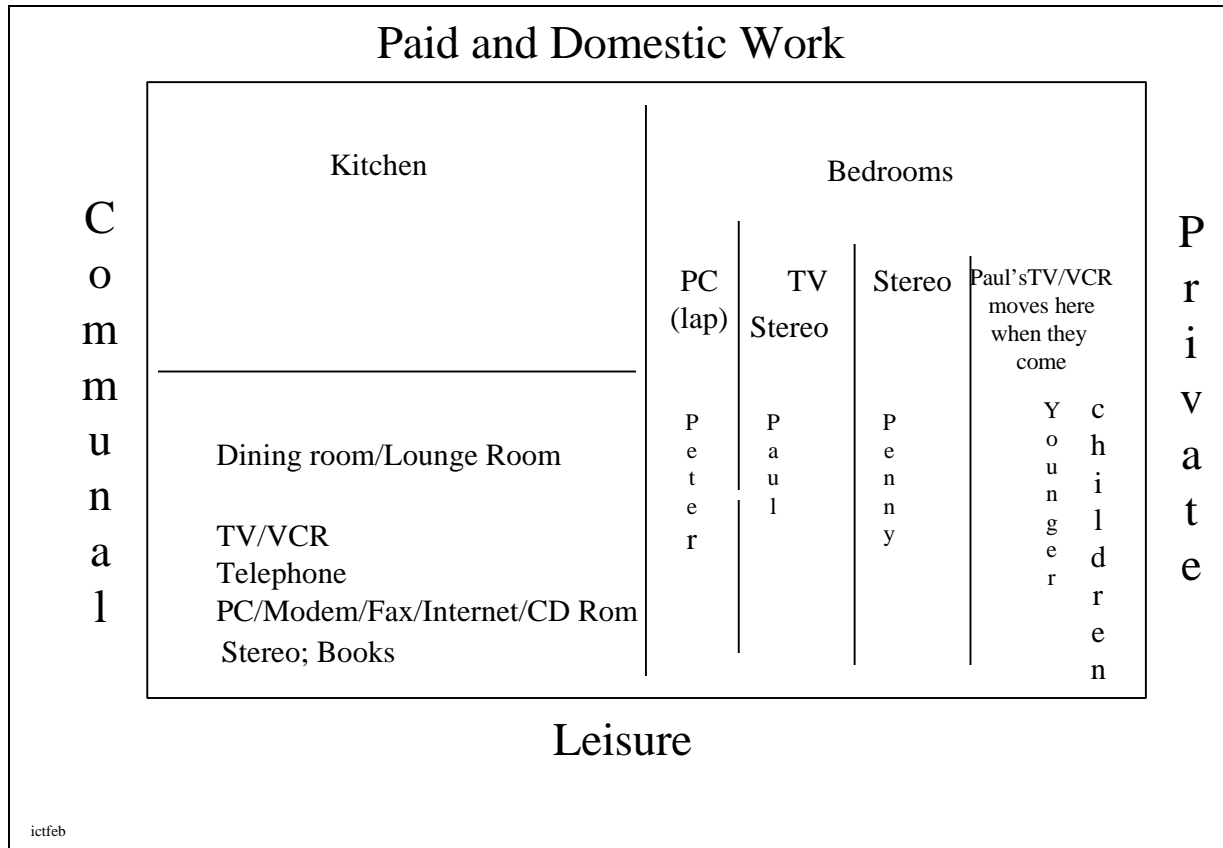
6.3.2 Peter, Paul and Penny: Concentrating the ICTs

Peter is a single parent with two young teenagers, Paul and Penny living in their new house in an inner suburb of Melbourne. He is in the Information Technology field. Peter's two younger children also regularly come to stay. This household is unusual because they are happy with their PC and the fax modem in a communal leisure area rather than a personal work area. Moreover the telephone and answering machine, television and the VCR are all clustered in the lounge room/dining room area.

This positioning of the ICTs has been influenced by three factors. First, there is only one phone, so the PC and the fax/modem have to be situated near it. The phone has been moved via an extension cord from the hallway where the phone connection is, to the dining room. Second, the PC in their house is used for both work and leisure. It is used for study and games by Paul and Penny, whereas Peter uses it mainly for work and email. However, Peter uses it early in the morning when the children are asleep, converting the lounge/dining area into a private work space. This is despite the

fact that he has a laptop that he sometimes uses in his bedroom. Third, there is a lifestyle choice being made where the focus is on the physical togetherness of the family. Peter says it allows him to be in the same room with his family while they are doing different things at the same time on different ICTs. Moreover, with the computer being in a central location, the children are encouraged to use it.

Figure 7: Space and ICTs in Peter, Paul and Penny's Home



In their previous house, the computer used to be in a separate area and geared to his partner's use of it for work. However, Peter prefers the computer to be in a central place. He says:

Actually I prefer it there than off in another room, because you can sort of work there and do things and still be part of... People can be watching television and you're still kind of all there in a sense. It doesn't matter [that] you're not all doing the same things. A bit of common presence, whereas if you go off in another room then it's quite separate.

7. Simultaneous Usage of Multiple ICTs

There is a hierarchy of ICT usage, when multiple ICTs are used simultaneously. The dominance of one ICT over the other is influenced by the number of users and the spaces in which they are being used. In this section, the emphasis is on the hierarchy of ICT usage, rather than the way gender and power influences who uses which ICT in a certain space and time. This remains an important dimension and influences the way this hierarchy of usage can be played out in any single household.

7.1 Usage of Multiple ICTs By One Person

People often take part in multiple activities at once. As this is also true of activities involving ICTs, one person can use more than one ICT at the same time. However, as both activities cannot be equally dominant, there are dominant and subordinate ICTs. The PC by virtue of its interactivity and visual nature is most often the dominant ICT, followed by the TV. The stereo which is aural is always the subordinate ICT.

Multiple usage of ICTs can take place in personal or communal spaces as people may choose to personally use two or more (usually only two) ICTs at once or they may be involved in another person's activity by virtue of sharing the same space. For instance, when a person listens to music on the stereo or the CD ROM while seeing TV or working or playing on the PC, the stereo/CD ROM is the subordinate ICT used for a background, aural, passive activity. When a person uses the PC and TV together, the TV is the subordinate ICT used for the background, visual, passive activity with muffled sound. This allows a shift to the TV as the primary, foreground, visual activity when the programme warrants it. Teenagers are the predominant users of the computer with background activities. However, they do not do it consistently, as the level of concentration required on the computer might mean they don't want any background activities.

The television is the most adaptable of all the ICTs. It can be a dominant or a subordinate ICT. It is both visual and aural. People watched it with others or by themselves, along with other activities or just by itself. Others used it at times just to listen to what was going on while they were involved in other activities. One woman with two young, noisy children turned it on without the volume to keep her company while she did other activities. The television also provided time-out for other activities such as showering and talking on the phone for a couple of mothers by providing a temporary distraction for their children.

The stereo was most likely to be used in conjunction with other activities and was most often the subordinate ICT. Its aural quality makes it ideally suited to this. The television is the next likely ICT to be used by a person for multiple simultaneous activities. The PC was sometimes used in simultaneous activities as was the telephone and answering machine (listening to messages whilst doing other things). The VCR is the exception as people didn't do other activities while they were watching videos. The only time the VCR became the subordinate ICT was when adults 'watched' children's videos whilst they were doing other activities.

This simultaneous use of multiple ICTs needs to overcome location issues in the home. As the PC is commonly located in personalised work spaces, the 'leisured' ICTs such as the TV and stereo are not always found in the same area, except in the case of computers which have existing CD ROMs.

In some cases, the secondary TV and stereo are placed in the personalised work spaces, so that these multiple activities are possible. It then allows a person the option to use them simultaneously with computing activities. When there is only one PC, TV, phone, then portability offers options to move them back and forth between the different areas of the house. The third option is that seen in Peter, Paul and Penny's household, where the PC has taken on a more leisured aspect, and the lounge/dining room area gets converted into a work area after the children are asleep. Hence, both the meanings of the ICT and the social spaces in the home become fluid.

7.2 Usage of Multiple ICTs by Multiple Persons in the Same Space

Often in communal areas where there are several different ICTs within the same space, compromises have to be made when there is a clash in usage. ICTs with aural components can become background activities to those with visual. However, it is uncomfortable (but not impossible) for an aural component of an ICT to become a background activity to another aural ICT. For example, people will sometimes watch television with the sound off and listen to the stereo, but will prefer not to listen to the sound from both the television and the stereo at once. Therefore there tends to be a compromise and one ICT must give way to another.

There are some general patterns which have emerged across households for the kinds of compromises that are made when there is a clash in ICT usage. Commonly the compromises have to be made between the stereo, television and VCR and occasionally the PC, as these are the ICTs most likely to be in the same space.

There appears to be a common hierarchy of use. The stereo is switched off to give way to the television. This is so accepted that there doesn't appear to be much conflict between the use of the two ICTs. Moreover a person generally has access to another stereo. Children particularly have their own stereos, rather than television sets, in their bedrooms. Children's taste in music is also not usually shared communally, and parents preferences may dictate stereo usage in the communal space in which they have more control than their children.

The TV is preferred over the stereo, but the VCR takes precedence over the television. Often there is not a clash between those using the PC and others using other ICTs, but personal preferences sometimes dictate the need for a quiet space. When this happens the PC takes preference over the other ICTs. However, in the households where the primary computer was in a communal space as in Olivia's and Peter's households, an effort was made to recognise the communal meaning of the space by using it as a personal work space at times when it was not in great demand.

When a conflict does arise about the usage of multiple ICTs in the same space often one or more people may elect to carry out the activity in another space. When the television takes priority over the stereo the other person has to use headphones or another stereo in another room. Perhaps as there seems to be only one VCR in every household, this explains its importance in comparison to the television where there are often multiple units. Conflict may also arise when two people may wish to use the same ICT in different ways eg. watch different television programs. In this case, the person with the least power gives way and may also elect to carry out their activity in another space.

8. The Mix and Match of ICTs for the Same Activity

People have different ways of performing an activity or some element of an activity. This was illustrated in Figure 2, where a person may seek information about shopping through face to face interaction, magazines or newspapers, catalogues, by phoning friends and family, or telephoning a store, seeing a product or service advertised on TV, or searching for information on the Internet. A person may order an item personally in the store, over the phone, by fax or mail, or on the Internet. The choices are also as diverse for paying for the goods or service - by cash over the counter; by cheque over the counter or mailed or paid to a collection agency like a bank or the post office; by a credit card that is personally handed over the counter, or where the number is phoned, mailed, faxed, emailed or sent over the Internet; by direct debit via EFTPOS or a standing instruction. This ability to mix and match different ICTs for the same activity is best illustrated through a look at how residential users use old and new forms of money to pay for their transactions.

8.1 Using Old and New Forms of Money

There is a media image that Australians have enthusiastically adopted new technologies making cash increasingly irrelevant and that "a wallet full of plastic cards" is now a "way of life" for Australians (Mann, 1993). This picture of the adoption of electronic banking technology however blocks the fact that for most Australians, cash, the cheque and the branch remain the central payments and transactions mechanisms. Despite a fast rate of growth in electronic payments and transactions:

- Cash remains the most popular and convenient way of paying for everyday transactions of small value in Australia. Though there is no hard evidence, it is estimated that some 90 per cent of the number of transactions are in cash (Bank for International Settlements, 1994, p. 8)
- The cheque is the most popular form of non-cash payment in Australia. In 1995, its volume (38 percent) exceeded that of credit cards (10 percent) EFTPOS (13 percent), ATM (17 percent), direct entry credit (18 percent) and direct entry debit (4 percent) (Mackrell, 1996, p. 4).
- Though high-value electronic funds transfer is now for the first time higher in value (63 percent) than cheques (35 percent), cheques continue to dominate over retail low value electronic funds transfer which remain unchanged between 1991 and 1995 at 2 percent (Mackrell, 1996, p. 5)
- Though payment by cards is increasing, it still comprised only 0.1 percent of cashless transactions in value, and 15.4 percentage by volume (Ibid. pp. 46, 48)
- The number of ATMs and EFTPOS outlets is increasing in Australia. However empirical research suggests that the branch remains an important access point for banking, even when persons have electronic access (Singh, 1994)
- About one third of Australian adults have no electronic access, that is they do not have a plastic card to access ATMs or EFTPOS. Research on low income Non-English speaking background persons with literacy difficulties shows two-thirds of them had no electronic

access. Only 17 percent had a cheque account. So they are wholly dependent on cash as a payment mechanism (Singh, 1994).

It is difficult to go beyond this picture to detail the use of these different payment and transaction mechanisms. As the Australian Payments System Council notes in its 1993-1994 Annual Report, “Only limited data are available on the *number* of payments, and none on the relative *usage* by consumers of different payment instruments” (Australian Payments System Council, 1994, p. 19).

The lack of data is even more worrying, for our interviews show that in order to illuminate the way people use money, one has to go beyond the use of payment instruments such as cash, cheques and plastic cards and transaction modes such as branches, ATMs and EFTPOS. These categories are important for banks to assess their products and delivery of services, but do not represent the way users deal with forms of money. When people speak of forms of money, they go beyond saying they use plastic cards and specify whether they use them across the counter, or give the number over the phone, mail, fax or the Internet. Hence the form of money partakes of both the payment instrument and the mode of transaction. Moreover, the mode of transaction goes beyond the banking system and includes the use of ICTs such as the telephone, fax and Internet, and other delivery systems such as the post office counter and the mail. In Figure 8 we illustrate the different forms of physical and electronic money current and possible.

Forms of money can be broadly grouped as physical and electronic, depending primarily on the transaction medium used. Physical forms of money include physical payments instruments and physical transaction media. They comprise cash and cheques transacted person-to-person and across the bank branch or post office counter. Cheques sent by mail would also belong here. Along the continuum between the physical and the electronic are plastic cards - credit cards, debit cards, stored value cards, smart cards - transacted physically across the counter or by mail. Electronic forms of money include those that involve payments instruments with no physical representation such as direct debit and credit and the electronic versions of cash and cheques. This category also includes payments instruments that use electronic transaction media. These include plastic cards used with ATMs, the telephone, fax, email or Internet and EFTPOS. It would also include cards used to debit transport payments via remote sensing devices.

The categories of physical money and electronic money are ideal types. When one speaks of electronic money, there is the assumption that it is virtual money, that is, it is not physical, it is not tangible and cannot be held and touched. This is true if one compares cash, that is currency and direct debit or credit. It must be remembered that even currency is symbolic and representational. Money, like other ICTs, is multidimensional, as represented in Figure 3. Money has a social and cultural context; it has an information dimension. With money, the content is the transaction. Even when the context is a virtual context as with payments through EFTPOS, often the success of the particular form of money rests on the fact that there is a physical record and it yields physical cash. So one has the situation that physical money like cash may have no record; whereas electronic money obtained from the ATM and EFTPOS is accompanied by a physical record and tangible money. This information dimension of money will be discussed in greater detail in section 10.1.

Figure 8: Forms of Money

Form of money	Payment instrument	Mode of transaction
Physical forms of money		
“Real ” cash	Cash	Person to person Branch Post office
“Real ” cheque	Cheque	Person to person Branch Post office Mail
Electronic forms of money		
Direct entry		
Bank direct	Direct debit/credit	Written instruction to bank
Telephone direct	Direct debit/credit	Telephone
Internet direct	Direct debit/credit	Internet
EFTPOS direct	Debit card	EFTPOS
Electronic cash		
ATM cash	Cash; plastic cards	ATM
EFTPOS cash	Cash; debit cards	EFTPOS
Internet cash	E-cash; DigiCash; Net cash	Internet Internet/email/phone
Electronic wallets	Stored value cards	Person to person; ATM Internet
Electronic credit		
“Real” plastic	Credit card	Person-to-person
Mail plastic	Credit card	Mail
Phone plastic	Credit card	Phone
EFTPOS plastic	Credit card	EFTPOS
Fax plastic	Credit card	Fax
Internet plastic	Credit card	Email; Internet
Electronic cheque		
ATM cheque	Cheque	ATM (deposit)
Internet cheque	Electronic cheque	Internet

In order to illustrate the use of money in individual households, we detail the different forms of money used in Goldie and Gordon's household.

8.1.1 The Use of Money in Goldie and Gordon's Household

Goldie and Gordon in their 50s are both professionals. Gordon has just retired from his academic job and now has his own consultancy practice. When they were interviewed they had their son Gary, 31 and his wife Gwin, 30, staying with them temporarily, while they were in between houses. Their use of different forms of money is listed in Figure 9.

Figure 9: The Mix and Match of Forms of Money Used in Goldie and Gordon's Household

Person	Form of money	Transaction mode	Comment
Goldie	"Real" cash	Only from the branch	Fears being without \$100 in her bag
	"Real" cheque	Mail or over the counter	
	Electronic credit	Person to person No phone, mail, fax	Will not put her credit card number on anything
	Direct entry Electronic cash	Written instruction Has used the EFTPOS cash-out facility twice Will not use the ATM	For regular bank payments Felt unhappy about using plastic for food
Gordon	"Real" cheque	Bank branch Mail	Most payments are by cheque
	Electronic credit	Person to person Mail	For business expenses Rarely for food, though liquor will be on it.
	Direct entry	Written instruction	For regular payments
	Electronic cash	ATM Rarely uses EFTPOS	Is comfortable depositing cash through the ATM. Gets by on \$20 cash a week that Goldie hands to him
	Electronic cheque	ATM	Deposits cheques
Gary	"Real" cheque		Only for paying municipal rates, utility bills and subscriptions. One-third of his expenditure
	Electronic cash	ATM and EFTPOS Rarely goes to the branch	Needs cash specially when he travels to smaller towns and rural areas.

	Electronic credit	Over the counter Mail Fax	One-third of his expenditure Credit cards account for a third of his expenditure Only when he is dealing with somebody he knows
	Direct entry	EFTPOS Written instructions	For groceries Regular payments for loan repayment
Gwin	"Real" cash	Branch	Uses cash for 50 percent of household expenditure in terms of value
	Electronic credit	Over the counter Mail; Telephone	
	Electronic cash	ATM, EFTPOS	Uses this a lot as she is not close to bank branches
	Direct entry	EFTPOS Written instructions	For grocery shopping Regular payments for loan repayment

Figure 9 graphically illustrates their use of different forms of money. These different forms of money are used for different kinds of domestic and market money. Each household deals with various kinds of domestic money, such as housekeeping, discretionary spending, utility bills, and gifts and allowances. It deals with market money such as tax, investments, superannuation payments, mortgage payments. There is also a 'hybrid' form of money, which partakes of both the domestic and market domains such as family business money, wages and other forms of income. The correspondence of these different forms of money and different kinds of money will be elaborated in Section 10.1.

Part V Purchase and Take-up Decisions

Our questions on purchase and take up of new ICTs and services built on our understanding of the way persons used ICTs at home. In this part of the report, we deal with the “new” ICTs residential users had purchased, and the online services they were using or proposed to use. The “new” ICTs they bought were the answering machine, the cordless phone, the mobile phone, a PC and a fax/modem for Internet access. These were work or communication related ICTs. None of our respondents had cable TV, though one household was contemplating subscribing to it, once their area was cabled up. Every household had a TV and a VCR. So the main purchase decisions for entertainment ICTs related to secondary ICTs. The entertainment dimension was better covered in our consideration of online services such as gaming and gambling and video on demand.

The focus of this section is on the factors that influence purchase and usage, rather than the process of decision making in the household. It became apparent as people told their stories that they were aware that their reasons for purchase often differed from their pattern of use. This was particularly evident in the case of the answering machine which was bought as it offered more connection with the outside world and with family. However one of the ways in which it was used, was to control this connection by screening calls. There were also apparent differences in the case of the PC. This was bought for work and study but was often used for games in addition to those primary uses.

Though this difference in purchase and usage is important, there is a need to distinguish between purchase and use of ICTs as equipment and ICTs as future online services such as home shopping, video on demand, home banking, gaming and gambling online. This is because future online services are offering a different way of doing things. In the next section we deal with both the equipment and the services, elaborating the differences between them.

9. Reasons For and Against Taking-up ICTs and Online Services

The main reasons proffered for take-up of the new ICTs such as the answering machine, mobile phone, PC or fax modem are the work/study needs of persons in the home followed by the security/connection needs of dependants.

The main reason for not purchasing these ICTs is that people do not see them as important for their needs. It is these needs that underlie a person’s assessment as to whether the ICT is seen to deliver value for money. Cost is most often cited as a reason for not purchasing an ICT with large initial costs, such as a PC, or with recurrent user costs, such as a mobile phone or an Internet connection, until it can be justified by a work/study or a security/connection need. It is need however that mediates cost, for if the need is strong, then that budget item becomes a priority, or a cheaper or second hand version of the ICT is sought.

Control of information, time, space and transaction and the preservation of context are particularly important when a person is deciding whether he or she will use online services. The loss of control and context may lead to the view that the new service is not needed, for it is not going to be delivering the service in the desired way. In Figure 10, we detail the reasons for the decisions to take-up or not to take-up these ICTs and services. All four reasons - usefulness; cost effectiveness; control and context - are important in different measure for the take-up of different ICTs and services. This will be further elaborated in the following sections.

Figure 10: Reasons For and Against Taking-up ICTs and Online Services

Factor	Reasons for take up	Reasons against take-up	ICTs & online services
Usefulness	Need it for work /study	Do not need it for work/study	Answering
	Need it for dependants' security or for connection	Do not need it for dependants security or connection	machine;
	Entertainment	Present channels are adequate	PC; Internet
			Pay TV
Cost effectiveness	Cheaper goods and services	Prohibitive cost of equipment, access or ongoing operation	PC, mobile phone;
	Considered affordable	Is not a common way of doing things	Fax/modem;
	Has become a common way of doing things.		Home shopping
	Is seen as a necessity in setting spending priorities	Other personal and family needs are a greater priority	Home banking
Control	Greater control over:	Loss of control over :	
	Information	Information	Information services
	Time		Home shopping
	Space/Distance		Home banking
	Transaction	Transaction	Online transactions
Context		Loss of context which gives primary meaning to the activity	Home shopping
			Gaming and gambling online

These reasons fit broadly into the schema proposed by Anthony Newstead in a report to Telecom Business Planning (1993). He looked at past successes and failures of telecommunication service innovations to formulate an evaluation framework for predicting demand. Based on the analysis of these innovations, Newstead developed a reference framework that could assist in predicting the most likely outcomes of new telecommunication services in the next five to ten years. At the very least it would help in the assessment process. He prefaced this by saying that for the major multi-functional ICT innovations, it was social rather than technological indicators over a generation, that will be significant.

For the short to mid-term innovations, that is those between five to ten years, an innovation must meet five essential criteria. These are:

- It must be useful. In the personal arena, it must meet one or more of the perceived or latent needs of survival, socialisation, esteem, leisure and development. In business, it must lead to one or more of five favourable outcomes: cost reduction, increase in productivity, management control, customer service and company image.
- It must be simple to use.
- It must be cost effective, providing value for money.
- It must be socially acceptable
- And psychologically acceptable (Newstead, 1993, pp. 4-5, 8).

This has proved a useful schema especially for evaluating the track record of existing ICTs. It is general enough to fit many scenarios and provides a useful check list for corporate decision makers. However, the more difficult questions involve specifying the content of each of the categories of usefulness, simplicity, cost effectiveness, social and psychological acceptability. Which factor takes precedence over the other? What makes people buy a VCR or connect to Internet even though they are not simple to use? When an ICT is simple to use, it encourages purchase. However, even if an ICT is complicated, persons may purchase it, using only limited functions which then makes it simple to use. Hence, the schema gives rise to further questions: What factors make a particular ICT useful enough for a person to buy it? At what point does an ICT become cost effective? What constitutes social and psychological acceptability? These are questions that need to be asked for every ICT and its use for several activities. In the next sections we deal with online shopping, video on demand, and gaming and gambling.

9.1 Online Shopping

The data on online shopping illustrate how usefulness, cost effectiveness, control and context apply to the reasons people give for their interest or lack of interest in home shopping. They also help shape the nature of their interest.

Fifteen of the 29 persons who spoke of online shopping were interested in it. Their reasons for and against using online shopping are summarised below in figures 11 and 12. Though these reasons are extensive, the inability to get the desired information and preserve context ensure that most of the persons limit their online shopping to a restricted range of goods. The interest is most evident to using the online service to get additional information about shopping.

Of the 15 who were interested, 12 were interested in buying books, CDs or software, where there is reliable information available about the quality of the product. Most people said they would shop online for small purchases of audio/visual materials and routine daily goods such as toilet paper and coffee. They were less likely to buy fresh produce or clothing, where it “matters what it smells, tastes, feels like.” Not trusting the information prevents usage. As Harry in his late 20s, says, that with home shopping, "I'd argue that you very rarely would get what you chose. One kilo of tomatoes, not too ripe, still quite firm, with no little black spots or blemishes on them".

Indra and Isabel, a defacto couple in their 20s, are particularly articulate about the importance of information and context for shopping. Indra says if he wanted to buy something from another country he would probably do so via the Internet. But Isabel says, “I'm a bit too touchy feely to buy something just on how it looks. I don't think there're many things that I'd like to buy that I couldn't touch.”

For both, the loss of context would also prevent them from using online shopping for their daily needs. Shopping is a pleasure for them and they do it face-to-face even though they often have to travel to do so. They have become friends with the shopkeepers and they are now part of their social network. Indra says:

It's also really a nice social thing for us, particularly the vegie shopping side of things because we go to an organic vegetable shop ...which is run by two absolutely sensational characters that provide a really friendly and warm personal service and we get along with them very well. So I really look forward to grocery shopping and being able to catch up with those two guys and find out what's going on and so on.

Figure 11: Reasons for Using Online Shopping

Reason	Responses
<p>Usefulness</p> <p>Cost effectiveness</p> <p>Control Information</p>	<ol style="list-style-type: none"> 1. It allows you to shop whenever and wherever you want 2. Provides access to larger markets 1. Will buy the goods or services if they are cheaper than obtainable elsewhere 1. Comparison shop for price, ingredients, weight, brand names, country of manufacture or specials. 2. Educate yourself as to what is around, what is fashionable before you go out and 'touch it'. 3. Sample in some way eg. listen to music, read the blurb of a book. Or virtually sample the feel, smell, fit 4. Have a trusted supplier eg. a fashion house where you know the fit and the quality of the fabric or a local store where you know they'll give you good fresh produce. 5. Know exactly where to get information that is categorised in an orderly and familiar way 6. Desirable to have information which links your order to your weekly pattern, nutritional needs, or is menu based
<p>Time</p>	<ol style="list-style-type: none"> 1. Get goods when you want them, even at midnight. 2. Get goods delivered 3. Choose the quickest options with a busy lifestyle.
<p>Distance</p>	<ol style="list-style-type: none"> 1. People in small rural towns often have to travel to larger towns in order to get better prices even for weekly items such as groceries. 2. Enables you to shop internationally for things that may not be available locally. A wider range than most local shops. Sometimes the only option, when local facilities like libraries are nonexistent. 3. Children are difficult to pack up and take shopping. 4. At least one person welcomed Video on demand for she was far from video shops

Figure 12: Reasons for Not Using Online Shopping

Reasons	Responses
Lack of usefulness	<ol style="list-style-type: none"> 1. Most housing estates are situated close to shops. 2. Do not need to order ahead, for only buy items when the need arises, eg. a jar of coffee or a loaf of bread.
Loss of control Information	<ol style="list-style-type: none"> 1. Internet delivery of software is at times hard to access. 2. Need to touch, feel, smell, hear. 3. May miss the specials
Transaction	<ol style="list-style-type: none"> 1. Would use the credit card online only with trusted retailers 2. Want to know there is a person receiving the payment 3. Not possible to negotiate price 4. Online money is too easy to spend
Loss of context	<ol style="list-style-type: none"> 1. Shopping is an enjoyable social experience that is not duplicated online 2. The computer is associated with the workplace rather than the home 3. For teenagers in our sample, shopping is a spontaneous, unplanned activity

9.2 Gaming and Gambling Online

Most people in our sample were not attracted to gaming and gambling online as they were opposed to gaming and gambling, and generally even more opposed to the idea of doing it online. For those who did buy Tattslotto or scratch tickets, or went to the casino, the expected loss of context and control were important reasons for not doing it online.

Five people said they bought Tattslotto tickets on a regular basis or now and then. Four had reservations about going online. The one who welcomed it was already a heavy user of the Internet for online services, such as shopping and banking. For the others, buying a Tattslotto ticket was part of other routine activities. Olivia who is married with two children, says:

We probably wouldn't bother.... Owen, her husband usually goes to a newsagent on Saturday afternoon to pick up his latest journals and magazines and stuff and he does Tattslotto. It's as simple as that.

For others buying Tattslotto or a scratch ticket is an incidental activity. As one of our respondents said, "When I'm walking past a place that sells them [scratch tickets] I can feel a bit of loose change clinking around in my pocket and I think oh what the hell, you never know".

For those in the sample who occasionally play the poker machines or go to the casino, the social context and meaning of gambling was its only appeal. Martha, in her 40s, married with children, says:

It's [poker machines] something I strictly do on holiday. Just something I like to do when I'm away. It's just something different. I don't do it at home...it's something about not being at home.

For her son Michael, in his late teens, a night out at the casino was having "a night out with my friends". The entertainment value of the casino was also more important than the gambling for Neil, in his late 20s. He says of the casino, "Just have a night's entertainment [at the casino], dress up, whatever".

The fear was that online gambling would lead to a loss of control of money. David, 50, in his own software business, was most worried that online gambling will come in. He said he was like an alcoholic with gambling, and twice found himself out of control. He says, "I can't bet \$5. I've got to bet a lot." One of the controls he uses to prevent himself from gambling is not to make the conscious effort to go to a gambling location. But when it comes into the living room, he wonders whether any kind of limit set will work for the serious gamblers.

In the next section we deal with the control of information as a key factor in deciding whether to purchase or use an ICT or online service. This is important not only for online transactions, but for the information and transaction aspect of every activity.

10. Control of Information

Control of information is a key factor in deciding on the usage of ICTs. This need to control information exists across technical expertise, educational background, income and general socio-economic status. As the discussion of online shopping reveals, the inability to get the desired information prevents people from using a service that offers control over time and space, as it makes it possible to shop anytime, anywhere.

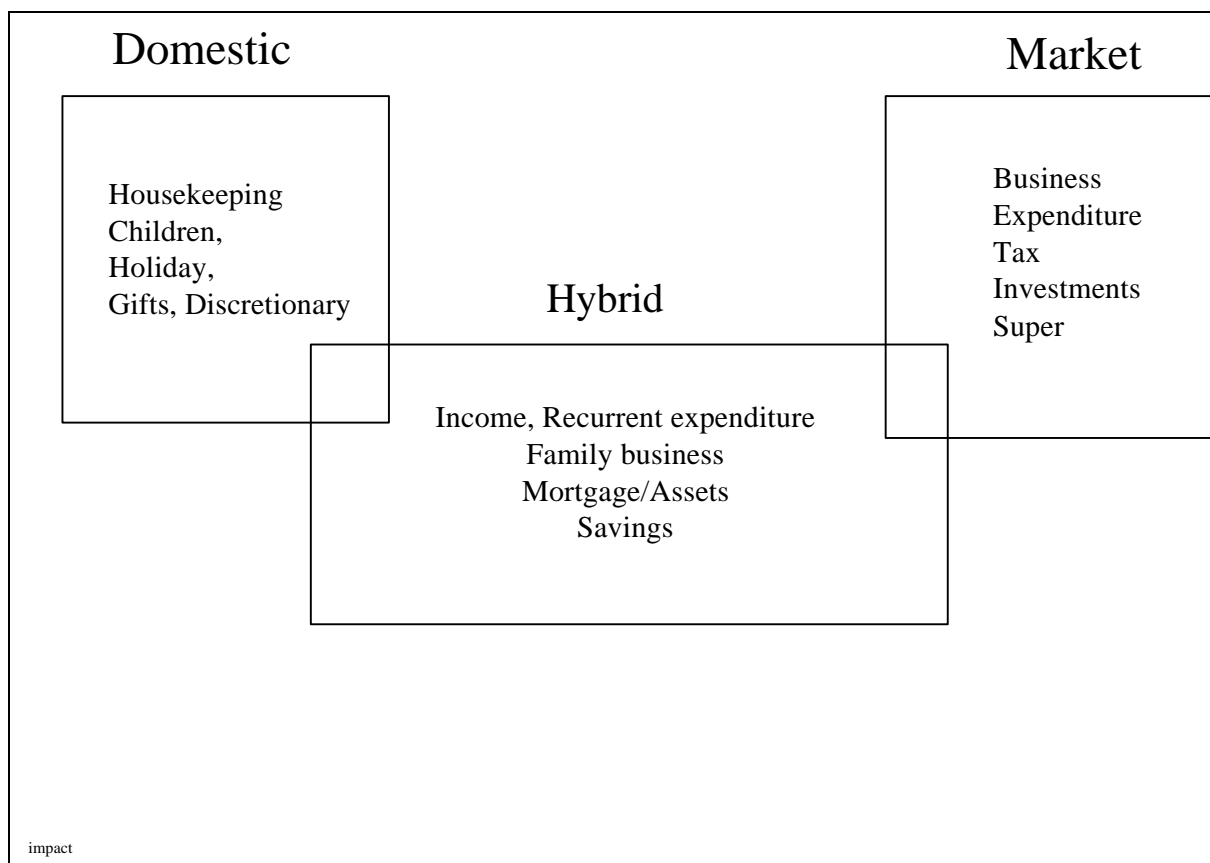
The online shopping example also shows that people require different kinds of information for different activities. The information required to buy a book online is different from the information sought to buy vegetables. It is this match between the information requirements of the activity and the service that determines whether the service will be used or not. In the following section we discuss its implications for the use of money.

10.1 Information and the Use of Money

As seen in section 8.1, people use a mix and match of new and old forms of money. In that section, we noted briefly that these different forms of money were used for different kinds of domestic, market and hybrid money. In this section we show that the forms and kinds of money are linked via information. Various kinds of money require different kinds of information. When these requirements correspond with the kind of information offered by different forms of money, then there is match between the form and kind of money. On this is overlaid a person's psychological comfort with personal or impersonal information; physical and virtual information.

Analysing money as a social phenomenon, we note there are different kinds of money that operate in the domestic sphere, the market and the overlap between the two. These monies shape and are shaped by social relations and cultural values (Singh, 1994; forthcoming a & b). In figure 13, these kinds of monies are graphically represented.

Figure 13: Kinds of Money in the Household



These monies are differentiated by their status, nature, source, purpose, amount, flow, ownership and accountability, as shown in figure 14.

Figure 14: Kinds of Money - Elements

• Status:	Domestic, Market, Hybrid
• Source:	Wage, Consultancy, Redundancy, Allowance, Benefits, Pension
• Purpose:	Housekeeping, Bills, Business, Security, Discretionary
• Amount :	Large or Small
• Flow:	Regular, Irregular, Lump sum
• Ownership:	Individual, Joint, Trust
• Accountability:	Nebulous, Budgetary, Calculable, Traceable, Evidential

impact

Housekeeping money for instance is domestic; personal; is used for paying regular grocery expenditure; and most often jointly owned by Anglo Celtic middle income married couples but managed by the wife. In middle income households, housekeeping money is not seen as a large amount at any one time. Hence, for most couples, the accountability of this kind of money is that required for setting budgets, rather than accounting for expenditure to an outside party. It is usual for couples to keep a close account of housekeeping expenditure when they are planning their budgets. When however, the housekeeping money is seen as a large portion of a tight budget, then the accountability increases.

Goldie, discussed earlier, in her 50s and with an annual income of \$60,000 to \$70,000, says she no longer wants detailed information about her housekeeping expenses. But when she and Gordon were first married and on a "careful budget, housekeeping took all we had". The budget was tight enough for her to know that they had two shillings for meat a day. So they ate a lot of lamb chops. Now, her need to know is confined to paying for food by cash, so that she knows it is paid for. When she used EFTPOS twice to pay for the groceries, as she had not gone to her branch to withdraw cash, she says she was most unhappy. Basics must not be paid by plastic card, she believes. Hence, the information she requires for housekeeping is to be able to personally verify the amount of money she is spending and to know how much she has left. For her, the personal and physical verification is essential for all money transactions. That is why she does not use the ATM to withdraw cash, but continues to withdraw it from the branch. She also does not put her credit card number on anything, and would rather send a cheque. She says that the ATM would not give her the kind of information she sought, for "I wouldn't be sure the bank was really going to transfer the money just if I was pressing a few buttons on a wall".

Gwin, Goldie's daughter-in-law, in her 30s, earning between \$40,000 and \$50,000 a year, also uses cash via the ATM or branch for her housekeeping. She says she prefers to use cash "so I know exactly how much is in there and how much I've taken out and I don't have to rely on statements." Not only is the physical dimension of cash important, but she gets more immediate and extensive information about the money spent and the money in hand, than she would get if she paid via EFTPOS. However, she does not want to track every \$50 she spends. She says, her need to track the money would depend "on what sort of money you're talking about... If it's \$50 it probably wouldn't matter so much. If it was \$500, then I'd want to keep track of it." It is this need to track money spent and money in hand that is responsible for persons on low income using cash rather than plastic for their housekeeping expenses. Cash by virtue of the immediacy, range and physical and personal reliability of information is a better check on expenditure than a form of money with information that is more retrospective, limited in range, impersonal and virtual.

The stories above illustrate some of the essential dimensions of information, particularly as they relate to money. These are: time range, reliability, and record. As illustrated in figure 15, different forms of money offer different dimensions of information. As noted earlier, even when the payment method is impersonal and/or virtual, the record may be personal and/or physical, as with the proposed Net Mixed Direct which uses the Internet for the transfer only after it has been confirmed by email and phone.

Figure 15: Information Dimensions of Forms of Money

Information Dimensions											
Form of Money	Time		Range		Reliability				Record		
	Immediate	Retrospective	Money spent or received	Money in hand or still in account	Personal	Impersonal	Physical	Virtual	Evidential	Discretionary	Untraceable
Physical forms of money											
Real cash	Y		Y	Y	Y		Y			Y	Y
Real cheque	Y		Y		Y		Y		Y		
Electronic forms of money											
Electronic cash											
ATM cash	Y		Y	Y		Y	Y		Y		
EFTPOS (cash out)	Y		Y		Y		Y		Y		
E-cash	Y		Y	Y		Y		Y	Still being trialed		
Electronic cheque											
ATM cheque	Y		Y			Y		Y	Y		
Internet cheque	Y		Y			Y		y	Still being trialed		
Electronic credit											
Real plastic	Y		Y		Y		Y		Y		
Mail plastic	Y		Y			Y		Y		Y	
Phone plastic	Y		Y			Y		Y		Y	
Fax plastic	Y		Y			Y		Y		Y	
Net plastic	Y		Y			Y		Y		Y	
Direct entry											
Bank direct		Y	Y	Y		Y		Y	Y		
EFTPOS direct		Y	Y			Y		Y	Y		
Phone direct	Y		Y	Y		Y		Y		Y	

The questions behind differentiating these elements of information are: Is the information about money immediate or periodic but retrospective? Is the information about both money spent or received and money still in hand or in the account as with "real" cash, or is it information only about money spent or received? Is the information personally mediated or impersonal? Is it gained in a physical and tangible context or virtual? Is the record generated by the form of money automatic as with EFTPOS and credit cards? Or is it discretionary and untraceable as with cash? Is the record evidential as with cheque records, bank statements or printed receipts?

It is the congruence between the information required by different forms and kinds of money that explains the mix and match of usage. Bob, in his late 40s or early 50s, is a dramatic example of this. He is an advanced computer, email and Internet user and works in the area of information services. For books, information services and software that he can access faster and cheaper on Internet, he also pays online. He has "no concern" about using his card on the Internet. He considers his risk to be limited to \$50, as it is with the use of a credit card with a PIN in Australia. As he regularly deals with one merchant for books, and he has visited the shop in the past, he has a degree of comfort with the information about the products, the transaction and the delivery.

His use of Net plastic however ill prepares one for his pattern of payments at home. He says he will not use phone or mail plastic to pay his bills. His preferred option is to pay all his utility bills by cheque at one time personally through the bank branch or post office. The cheque butt is his record for tax purposes. For him, the personal dimension of information overrides the physical dimension, for with Internet also, his personal acquaintance with the book shop transforms a virtual impersonal medium into a virtual personal medium.

The congruence between the different kinds and information is dramatically tested when there is a lifestyle change, such as retirement or redundancy or a move from wages to a home business. This goes beyond just moving from one form of money to another, for their need to track information goes beyond what forms of money can automatically offer. Hence, they need to place their income and expenditure on a recording system that is more conscious about this information dimension.

Gordon in his 50s and John in his 40s have both recently taken redundancy payments which they have invested for their retirement and income security. They have also moved from regular wages to the irregular flow of money through a home based consultancy practice. Now different kinds of money have become important in their household. Accordingly their need to track the information has become greater. Both John and Gordon use Quicken, a money management programme to account for the money spent and money that comes in; and to keep themselves informed with the way their investments are performing. Their need now is for accurate, timely, evidential information, giving the full extent of their holdings and of every particular investment. As Gordon says, the need is now to keep records to track everything you've made or spent, so as to claim deductions before paying tax. When he was on a salary, records were needed only to claim back some of the taxes paid. Resorting to Quicken gives them a level of record that is over and above the record inherent in different forms of money.

Part VI The Future

11. Perceptions of the Future

The overall perception of the future is that most activities will be mediated via the internet. This is what people frequently identify as the 'information superhighway'. It is the visible online world that people recognise. This also means that the PC is seen as the way to access this online world, rather than the television.

The main dimension of the Internet for 18 of the 31 persons who spoke of the information superhighway, was that it was a means of acquiring information. This is not only because of the term "information superhighway", but also because most people's experience of the Internet so far is of information seeking. Only one of 31 saw it as a means of purchase or service delivery, speaking of home shopping and home banking. Women appeared to be more likely to cite information as the major dimension. Eleven women saw the superhighway as giving them access to information compared to seven males. Though the Internet is currently strongly associated with email only one person described the superhighway as a means of communication.

There is a wide range of perceptions about the effects of new technologies and online services. There is a consensus that changes will be inevitable, though people differ about the depth of the change. A 29 year old man in our sample for instance, talking of the importance of the new technologies vis-a-vis personal interaction said:

At the end of the day I don't know that it's going to change things a great deal because people still like people and want to have interactions with people, and they don't want to do everything via a screen.

Attitudes to the changes range from doom and gloom about potential social isolation to enthusiasm about greater connectivity and community involvement. Greater familiarity with the Internet for communication and information seeking leads to a greater enthusiasm for technological applications. However, this could merely indicate that those with enthusiasm are more likely to take up or try out new ICTs. Those who use the Internet for information and email are the most enthusiastic about new technologies and their ability to give greater sociability and connectivity on a global scale. Jean, in her 40s and earning more than \$70,000 a year is an enthusiastic email and Internet user. She comments:

In my own life I see being able to... do things from home and having access to a world community at your fingertips. Being able to have access to things very quickly. Also a lot of social sort of connectivity too.... I think when all these sort of Internet modes and things are available like the telephone is available now... I think things will happen that people have never anticipated.

Those who are extremely computer literate and currently communicate, seek information and shop via the computer see a technologically mediated world as inevitable but are more aware of technological limitations and so see it as a long way off.

Women with children still at home had a mixed outlook, but most of them felt they would accept the change though not initiate it. There were 12 women with children still at home in our sample. Seven of these women appeared to be disinterested and resistant. However, they

anticipated they would have these new technologies in their home because their husbands and children would drive their purchase and use. None of these seven women used the computer for more than word processing at home. Nor did they use the Internet.

Ursula in her 40s with two children at home, and skilled at computer usage in the office, but shunning it at home, says:

No I'm not demanding these things. It's the family, the boys and my husband who want them and they've got them and I just go along with it... I personally like things the way they are. I'm not one for change. But working in an environment where change is encouraged and if you don't go along with it you just don't have a job, I'm kind of forced to go with the flow.

Of the remaining five, one woman felt she did not know enough about computers today to venture an opinion about the future. Three women familiar with computers through their work felt the changes would be major and would enhance their lives. It was interesting however that the woman who was most enthusiastic about the new world was also the one who was trying to overcome her computer phobia and was preparing to buy a PC for her children at home. Vickie, in her 40s, a single parent, says that with the new technologies:

I might be free to work from here a couple of times a week instead of going to [work]. It will keep my car off the road more. It will free space, work, it will give me greater flexibility. It will enhance my personal growth and development. It will free me also to be farmed out, to work in more than once place. To take on special projects. To maybe develop with people like you some of these ideas that I get in my head. I need to develop them with other people. And I will be able to do that. If I just added up the hours spent going from here to work or some of the work related trouble I would have another half week. That would be interesting. It might open up other parts of the world.

There was concern raised by one-third of the persons who spoke of the future - 11 of 33 people - of the negative social impact of new technologies. Seven of these 11 were teenagers. Of the four adults who expressed concern three were women with children, including one woman expecting a child.

Teenagers as a group were most negative about the social implications of new technologies. Of the nine teenagers in our sample (three female and six male) seven commented at length on the effect of new technologies on their futures. All see a move to a technologically mediated world as inevitable but all are concerned about the negative effects of these changes. Two of them pointed to a lack of privacy; three to laziness; three to social isolation. These teens perceive it would lead to the inevitable break down of society as they know it. Urwin, 16 says about the future:

[It will] be bad because they'll make you house bound... Where you used to go out to like say shops and stuff...Everything will be available from home. And they'll probably become ... very narrow minded. ...Probably bring quite a bit of crime... So as a whole it will probably bring down the whole society.

Varuna 14, the only teen without a computer says "People are going to become much less sociable...There are actually going to be more wars because people can't communicate". Mary 18, a sociable and outgoing teen is not interested in using new technologies and says "I don't like talking to computers".

Two of the teenagers, both male although concerned about the social implications were cautiously positive about what new technologies could offer them. Umberto 14, an enthusiastic and frequent computer user with aspirations to follow in his fathers' footsteps and enter the computer industry as a career, commented:

It would probably make things easier...for me it'd be more enjoyable. So I'd prefer new technologies to come out rather than keep the old ways. ..Kind of a privacy thing [is bad]. Because with the new phones for example you can find out their address. On the Internet you can kind of spy on them and things like that. You can see what file they're downloading I think. Things like that. So... privacy and viruses are my major concern.

Paul 15, also a frequent and skilled user although concerned about social implications at first, thinks that the new technologies would be extremely convenient for him:

Some of the stuff I've read about, we've become a pretty lazy country. Like homeshopping. You could just get your little beeper out and walk through virtual supermarkets and it'll all be there within 2 hours or something. So you wouldn't actually walk up or drive up to the place. I guess that's the best thing..., but pretty lazy. Certainly be a more convenient lifestyle. Wouldn't have to do much to get stuff you need. ... It'd be pretty good. It's definitely good stuff, I reckon.

This finding goes against a popular belief that younger people are far more comfortable about new technologies than their parents. Other recent studies are finding similar results. A report of British research says that "young computer users are more frightened of new technology than their parents" (Jackson, 1996). Similarly, another Australian study of teenage friendship groups in schools has found that teenagers are resistant to new technologies which may eliminate social interaction outside the home and cause laziness and health problems (Gillard et al, forthcoming).

There is little conclusive evidence as to why teenagers are so pessimistic about the impact of new telecommunications on society. Researchers have posed some possible explanations. Some British research (Jackson, 1996) suggests that young people in the 18 to 23 year old age group brought up in the "computer-dominated 1980s" have a familiarity with computers which actually breeds anxiety. Another explanation is that "young people's greater exposure to computers could make them more aware of the potential of new technology" (Jackson, 1996). Gillard et al (1995b) maintain that interest in new telecommunications are influenced by perceptions of the home as a place for privacy and control. Teenagers fear the new technologies will make the home the locus of all activities. While adults tend to see the home as a place of personal control, for teenagers the home is a place controlled primarily by their parents. So they feel they have greater independence in public spaces (Gillard et al 1995b).

Our data do not support the theory that familiarity breeds anxiety. Those adults who are more familiar with the Internet are more positive about the future than those who have had little experience. It is also important to question the assumption that young people are indeed familiar with technology. Our results indicate that young people's experience of computers is varied. Whilst all but one teen in our study have computers at home and are encouraged to use computers for school work, not all teenagers in our study have a keen interest in computers or equal access to computers in the home. All but one teenager in our study must compete with parents and siblings for computer time. Those teens who were frequent users of

computers and dominated the home computer, (Umberto and Paul), were far more positive about the future than their siblings and the other teens in the sample.

It is more difficult to use our data for comment on the new technologies, teenagers and the meaning of the home. The focus of our data collection was on activities and ICT use in the home. Hence, we did not probe into respondents' values about the meanings of home or inquire whether these influenced their perceptions of the impact of the new technologies. A more indepth study of peoples' lives, ICT usage, activities and values both in the home and outside, would be required to fully answer some of the issues raised here. What is clear is that further research needs to be done to determine what makes teenagers attitudes so different at times from the attitude of their parents.

12. Diversity Rather than Centralisation

Users place their own activities at the centre of analysis, seeing the greater functionality of ICTs as increasing their options to mix and match different ways of working, playing, creating, communicating, paying and being paid. Our research has documented how people locate ICTs in the home so that they correspond with the meanings of the activities they perform in the different spaces. It is the ICTs that change location when the meaning of a space alters because of a change in family and household composition. When an ICT takes on new meanings because of new functions, or the greater importance of one function over another, then the meaning of the space also alters to suit the new activities. The dynamic interrelationship between the meaning of an ICT, activities and spaces in the home also ensures that it is necessary to have flexibility of use built into its possible use.

When an ICT, such as the telephone is already being used for all these activities and has these different meanings, this correspondence of use and meaning is achieved by having multiple units in different areas of the home. When there is a single unit, then the same result is approximated by injecting portability. This is done via a cordless phone or a long extension lead. Moreover, the hierarchy of simultaneous usage of multiple ICTs by one person, or by different persons in the same space, demonstrates the need to have options built into the way ICTs can be possibly used.

Even when a person is thinking in terms of a work station rather than a single ICT, the picture is one of multiple locations rather than a centralised hub. Transmission and the infrastructure of the ICTs in the home is not under question here, but the users' equipment and services delivered in the home. Rachel is already using a work station built around the PC by her husband who is a computer analyst. As she is pregnant with her first child, she has already started to think of ways of using technology to care for the baby and connect with friends and family while working from home. She is thinking of a work station, but another package of ICTs which she sees as the social station. There would still be a need to separate ICTs within the station and the ability to "turn off" options. She specifies the television and the stereo would remain separate, for she enjoys listening to the stereo, and says her husband is a television addict. Looking ahead, she says the telephone component would have to have a non-video option and be able to be removed to another room if the son was using the social station for homework.

Our research shows that a key question at the centre of corporate strategy in the ICT world should be: How best can we add to the flexibility and diversity of ICT use, and so enhance the

value of our goods and services? This is a fundamentally different question from trying to discover the "killer application" or finding ways of delivering a package of ICTs that is all things to all people and is delivered as one controlling centralised unit in the home.

In order to ask this question, one has to move beyond the providers' perspective to the users' perspective. Instead of having an ICT or a package of ICTs at the centre of analysis, it is essential to place the user and his or her activities at the centre. This shifts the focus from the supply of ICTs to their use; from an assumption that a new ICT will roll over the older one to the realisation that there is going to remain a mix and match of new and old ICTs. It also substitutes the pacebreaking introduction of new ICTs with their gradual incorporation into the lives of people. Meaning becomes as important a dimension as price and understanding this meaning becomes a vital input into the identification and dimensioning of new markets.

For ICTs in particular, it means one has to go beyond the idiom of 'convergence' that has dominated discussion of the technologies and the infrastructure underlying telecommunications, to a discussion of the way people use these technologies. The discussion of convergence has implicit in it that ICTs are "coming together" and focusing on one central point. However, our research demonstrates that people seek flexibility to use a mix and match of ICTs in diverse ways so that this usage can fit in with the social meaning of activities. It also means one has to go further than noting that convergence is bringing about alliances of different industries, and changing organisational structure and culture. One has to see the way these technologies shape and are being shaped by cultural values and social relations.

13. Future Research

Our qualitative research has led to further questions about the use of ICTs. These fall into the following areas:

- ICTs, household composition and lifestage
- Multiple ICTs and multiple usage
- Cross cultural meanings of space and ICTs
- ICTs and the negotiation of power in the household
- The social and psychological comfort with different elements of information.

These questions are elaborated below.

ICTs, Household Composition and Lifestage

1. How are changes in household composition reflected in the location of ICTs in the home?
2. In particular, what is the effect of the first baby on the usage of ICTs?
3. How does the conversion of a two parent family into a single parent family impact on ICT usage?
4. How do retirement or retrenchment effect the use of ICTs?

5. How does a move from outside employment to a home business change the purchase and use of ICTs?
6. How does this differ from a change from paid work to unpaid work at home?
7. Why are teenagers so pessimistic about the social impact of new technologies?

Multiple ICTs and Multiple Usage

1. How are multiple PCs and multiple multimedia units used in the home?
2. In particular, why do teenagers appear to go in more for simultaneous usage of multiple ICTs?

Cross Cultural Meanings of Space and ICTs

1. What are the social meanings of space in different cultures?
2. How does this cultural difference affect the location and use of ICTs

ICTs and the Negotiation of Power in the Household

1. How does behaviour within a household change with the purchase of an ICT?
2. How is ICT use negotiated in families of different socio-economic status?
3. How is it negotiated in different cultures?

Social and Psychological Comfort with Different Elements of Information

1. What socio/cultural or psychological factors influence a person to choose between physical and virtual information?
2. What factors impact on a person's comfort with personal and impersonal information?
3. How important is gender in this choice of different kinds of information?
4. What is the congruence between habitual activities, the required information dimensions and comfort with different kinds of information?

Answering these questions will add to the insights about the use of ICTs in the home, enabling service providers to better meet customer needs. It will also lead to a better understanding of the interrelationship between technology and society. This understanding will contribute to a society that values flexibility and options in its use of ICTs for personal and social needs, rather than the pessimistic view that it is technology which will drive the shape of future society.

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