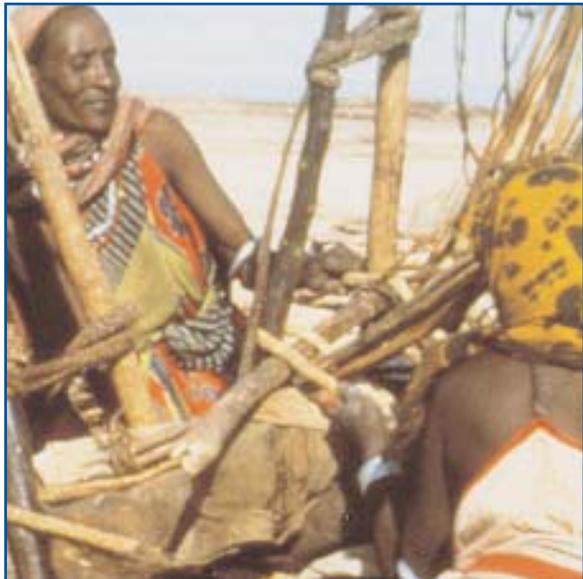


The Household Horizon:

A Guide to Technology and Daily Life in 2012



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| Mustang GT k, AT, \$8450 0-676-3020 | HONDA '86 Prelude, at snrf, gas saver \$1275 (510)220-5409 |
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The Household Horizon:

A Guide to Technology and Daily Life in 2012

Institute for the Future

January 2003
SR-788 A



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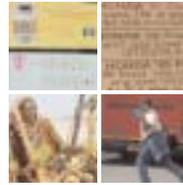
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EXECUTIVE SUMMARY



Over the next ten years, technology will drive three important shifts in the daily activities of the household with impacts on virtually every aspect of an individual's life, including their activities as consumers. These shifts are:

- From **managing boundaries** to creating **focal points** for information and relationships
- From viewing the **virtual world** through a flat screen to engaging with **intelligent social objects**
- From juggling **episodic interactions** to experiencing **persistent worlds**

Through the Institute for the Future's (IFTF) research in 12 separate studies with over 500 respondents, we forecast the following key changes in household behavior:

- **Information work** will shift from screening and filtering flows to finding and frequenting hot spots; from working with screens that are full of data to acquiring informative objects; and from periodic coordination to continuous monitoring and tracking.
- **Social networking** practices will shift from managing contacts to swarming; from building virtual communities to forming machine partnerships; and from sharing slices of life to creating persistent companionship.
- **Mobile life** will shift from navigating boundaries to developing center/periphery relationships; from transporting resources to seeking them out in the surroundings; and from making transitional connections to maintaining contextual presence.
- **Identity creation** will shift from switching contexts to reading personalized signs and signals; from managing virtual personae to creating a chameleon body; and from managing a fragmented self to maintaining a personal presence.

As these daily practices change, so will the marketplace for products and services. At the same time, the reinvention of household activities gives products and services new meaning, from which emerge new consumer values and desires. Ultimately, these values and desires translate into brand opportunities for companies.

This report, *The Household Horizon: A Guide to Technology and Daily Life in 2012*, offers a framework for analyzing the impact of technological shifts on household behavior and then provides details for the specific forecasts mentioned above. In a companion report, *Technology and Daily Life: A Spotlight on Entertainment*, IFTF Special Report, SR-788 B, we use the framework to examine a single domain, that of entertainment, in more depth.

1. THE PROBLEM



Drawing on our emerging technology research, IFTF has forecast several big changes on the technology horizon, including a highly-connected world of distributed computing, new premiums for small-scale energy technologies, new manufacturing paradigms based on sub-micron technology, and a new health economy shaped by innovations in the life sciences sector.

For companies that want to succeed in the consumer marketplace, the question is:

How will these technologies—or any other major innovations—change the purchasing patterns and preferences of household consumers?

Answers to this question must go beyond simple analyses of product and service opportunities that a new technology affords. The Internet, for example, allows broad connectivity of computers, but no one in 1995 was predicting that one of the major uses would be peer-to-peer swapping of music, or that this mostly illegitimate activity would spawn a market for a whole new class of consumer electronics—namely the MP3 player. Forecasters were even less likely to anticipate that pagers originally designed for professionals would eventually drive teen social behavior.

And yet there are thousands of clues in hundreds of IFTF surveys and interviews about the way that new technologies change household activities, relationships, and spending patterns. What is needed is a framework for analyzing these clues systematically to identify:

- New categories of need for products and services
- New expectations for existing products and services
- New meanings of old activities that will reshape basic consumer fears, values, and desires

The goal of the Household Horizons research has been to create such a framework and to then use it to forecast the impact of three key technology changes on the household and household inhabitants.

THE PROBLEM OF TECHNOLOGY ADOPTION

Technology creates a framework through which we experience the world around us—the people in it, and the routines, rituals, and practices that become our daily experience. As we adopt new technologies, we fit them into our daily experience in order to meet our needs, desires, and expectations in life. In this process of technology adoption we re-contextualize technologies—to give them new value and meaning. At the same time technologies re-contextualize our life by creating the framework for how we see and interpret the world.

Understanding the iterations of technology adoption and cultural creation is important for forecasting future consumer needs, desires, and sources of value. To better understand future sources of consumer value, desires, fears, and application areas for technology, we need to understand the consumer relationship to technology in the context of the consumer's whole life. In essence, we need to understand how new technologies will frame choices and shape practices in the course of daily life.

To do this, we need to map the new landscape of the consumer's daily life as it is shaped by technology. We need to be able to navigate through this emerging landscape to understand more specific consequences of technology as consumers use them to mediate their daily lives.

AN IN-DEPTH VIEW OF THE HOUSEHOLD

The household today is in constant flux. Shifting demographics, an ever-widening network of household connections with the world, and continuous technological innovation all conspire to make household stereotypes misleading and even economically disastrous for companies that want to compete in the consumer markets of the future. It is not sufficient to make broad general assumptions about the nature of the

future household and then ask a few pointed questions about technology. Rather, what is needed is an in-depth understanding of how households invent themselves over and over, day by day, through their daily interactions with innovations in their environment.

This report draws from IFTF's vast database of qualitative data on how individuals and households adopt technologies and use them in their daily lives. The framework and insights are based on at least 12 separate studies that included interactions with over 530 respondents in the form of individual ethnographic interviews, observations, structured group processes, and other qualitative methods. The interviews and respondent interactions took place in various cities around the world, including: Silicon Valley, San Francisco, and the greater Bay Area in California; Dallas, Texas; Westchester and Manhattan, New York; London, UK; Berlin, Germany; Hong Kong; Beijing, China; Taipei, Taiwan; Bangalore, India; Dublin, Ireland; Sydney, Australia; Tokyo, Japan; Stockholm, Sweden; and Santiago, Chile.

THE CONNECTIVE TECHNOLOGY LANDSCAPE

This report also draws from our work in mapping the technology horizon, specifically the horizon for connective technologies (*Eight Connective Technologies*, SR-754 and *A New World Map: Technology for the Coming Decade*, SR-774). While this is not a report on individual technologies and applications, it is an examination of how new connective technologies—from wireless sensors and tags to new displays and biometrics—will shape future household daily life. What we try to do in this report is show the relationship of technology to the evolution of specific daily life practices and domains of household activity. This approach can be extended to examine specific technologies in more depth or to understand the specific meanings of practices in various countries, regions, and cultures.

2. THE FRAMEWORK



To create a framework for understanding the impact of new technologies on households, we looked at four key elements of daily life:

- **The key players in household interactions:**
These are the people we interact with on a daily basis—members of our family, our peers and colleagues at the workplace, representatives of business, and members of the community at large.
- **The most important domains of household activity:**
These are the defining activities of our lives, ranging from parenting and career development to entertainment and shopping. They represent the shared meaning we give to our interactions with the key players.
- **The daily practices of householders across these domains:**
Daily practices are the methods, strategies, or techniques employed and developed by individuals in order to accomplish the goals and objectives of the various domains.
- **The transformative issues that arise from new technologies:**
An example of a transformative issue is a pervasive concern about managing boundaries as a result of technological innovations that ease access to people and information across traditional boundaries.

We have organized these four elements into a graphic compass that can be used to guide us through the household horizon of the future. Moving around the compass, we can examine how household life changes as people, technology, and household activities intersect. Working from the center out, we can consider the consequences of new transformative issues on daily life. We can draw this map for the present or the future, changing the practices and domains to reflect the impacts of these issues. Figure 1, on page 7, shows the version of the compass we will use for this report—a view of daily life in 2012, as shaped by key issues arising from connective technologies.

HOW TO READ THE COMPASS

As new technologies diffuse throughout society, they raise transformational issues that get played out across the various aspects of our lives. These issues form the core technology issues in the center of the compass. The three included here—focal points, social objects, and persistent worlds—are culled from our analysis of hundreds of householder-interviews.

The four points of the compass represent the four groups of key players in household interactions—family, workplace, community, and business. These four groups provide the social context for most of daily household activities. They are also the key channels for reaching consumers.

The domains of household activity are shown in the outside ring of the compass. They include, but are not limited to, social networking, information work, health, entertainment, career development, identity creation, shopping, and parenting. This is where products and services derive their meaning in daily life.

Connected to the individual domains of activity are the daily practices that will be developed and shaped in response to new technology issues as householders meet the needs of their daily activities. This layer of practice is a fertile one for understanding the daily consequences of new technology paradigms—and specific product and service requirements. Examples of such practices include continuous monitoring and tracking, swarming, developing relationships, and managing personal presence.

The compass thus serves as both a graphic forecast of daily life in 2012 and a tool for exercising different scenarios about the future, including product and service opportunities, new household trends that might change the marketplace, a redefinition of key domains, and new consumer values.

For more specifics on how to *use* the compass framework, see page 34.

Figure 1
 A Technological Compass for Understanding Daily Life in 2012



Source: Institute for the Future

3. THE FORECAST



SHIFTS IN CORE ISSUES: 2002-2012

We're at the edge of a new technological paradigm that will diffuse into household life over the next ten years and raise new core issues to shape our mental frameworks for how we experience our daily lives. We're about to head into a world rich with sensors. Leveraging the Internet's connectivity and mobile computing infrastructures of the 1990s, these sensors will be connected and able to communicate among themselves and with us. The basic overarching shift here is from access to awareness. This means that the products and services that consumers purchase in the next decade will be embedded with processing power, information, connectivity, and most importantly, awareness of their environment—of conditions, of people, and of other objects.

The new sensor technology paradigm is going to initiate three big shifts in core issues that frame household life as consumers begin to incorporate these new technologies in their daily practice. They include shifts from:

- **Boundaries to Focal Points**
- **Virtual Spaces to Social Objects**
- **Episodic Interactions to Persistent Worlds**

These shifts collectively alter the nature of our social and cultural world—the methods and structures that guide us through our social world and the meaning that we place on people, objects, interactions, and skills. The new technological issues are not necessarily substitutions for earlier ones, but rather they layer on top of the older ones. New daily practices also layer on top of old practices, so the picture of household life gets more complex and intricate over time.

In the remainder of this report, we will apply the technology compass framework using the three core issues. We will focus on their role in future daily practices related to four domains of household activity: information work, social networking, mobile life, and identity creation. Change in these four domains represents new kinds of relationships with information, people, the physical surroundings, and the self. Indeed, a new daily nomadic life may be emerging that will fundamentally change the way we think about mobility, information, the physical environment, and the way they contribute to a new social and material infrastructure for our daily lives. Understanding how new practices will emerge in these domain areas will help anticipate new issues related to work and family and also new sources of value for householders in their daily life practice.

THE FORECAST

FROM BOUNDARIES TO FOCAL POINTS

There will be a breakdown in the significance, or primacy, of boundaries and a shift to focal points out in the world as a means of defining our relationships to people and daily tasks. Issues such as the home-work boundary or the private-public boundary will get recast in terms of focal points, or hot spots, of information, processing, and connectivity. This shift is really about the rise of information hot spots as points of orientation in our lives. In a world of focal points, physical places and objects will have great significance in how we organize our day and how we decide where and how to interact with other people.



▲ Markers for Wireless Nodes

FROM VIRTUAL SPACES TO SOCIAL OBJECTS

We will see a shift from looking into virtual space through our computers to interacting with social objects that bring cyberspace to us. As the physical products, objects, and places in our lives are able to respond to us directly and to the specific environment we are in, we will develop new relationships with our physical surroundings. This shift places an emphasis on interaction and relationship rather than access—interacting directly with objects that are embedded with information, connectivity, and awareness of us and of our environment. Social objects take us out of cyberspace and into the real world, but also bring cyberspace, and all its functionality, into the objects themselves.

FROM EPISODIC INTERACTIONS TO PERSISTENT WORLDS

We'll see more continuity in our interactions as we shift to persistent worlds. Rather than experiencing the virtual world in a series of discrete episodic interactions, we'll have a world of ongoing or persistent experience. In this last shift, we move from experiencing discrete interactions to forms of ongoing presence. This adds the dimension of continuity to our daily practices. Right now, we engage with information and with each other in a series of interactions to communicate or exchange information. In persistent worlds we'll be able to create a continuous presence for our interactions with each other or for information. This is the world of always-on awareness rather than episodic access.

DISRUPTIVE CHANGE IN THE HOUSEHOLD LANDSCAPE

As technologies change, so can the ways that we interact and interpret the world. History offers a rich example of this cultural process. Peter Wilson wrote, in *The Domestication of the Human Species*, that the innovation of permanent architecture and the related process of domestication affected the way humans see and perceive their environment, specifically how they see each other and the kinds of social practices and political constructs they develop to live together successfully. He describes how hunter/gatherers lived in open societies and spent most of their lives, even the most intimate moments, in plain view. Domesticated societies have lived in more stable and permanent settlements with walls that shield visibility from others, specifically neighbors.

In comparing the two societies Wilson notices that domesticated societies developed a notion of boundaries that shaped how they interacted, and the practices and values for what they shared and what they concealed. Visual perception and attention also developed differently. For example, domesticated societies, with their walled homes and private spaces, developed more complex systems and uses for witchcraft and sorcery than hunter/gatherers as a way to manage and deal with the unseen—what went on behind the walls of their permanent dwellings. In his book, Wilson suggests how successive technology paradigms can change the context from which we alter or develop new abilities to see certain daily practices or values as central to our lives. Will we experience as profound a transformation in our human perception and awareness as permanent architecture and domestication triggered for hunter/gatherers?

Source: Peter J. Wilson, *The Domestication of the Human Species*, Yale University Press, 1991.

4. INFORMATION WORK



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| Sales Hayward 28-9880 Mustang GT 800mi warr 443-1545 9 Taurus k, loaded wheels 12 \$8,988 HAYWARD 86-2600 Taurus Se nd, loaded 10-471-9454 | HONDA '91 Accord 4dr, at 103k 1 \$4450 925-846-5 | League Notes: Get an edge on the competition with StatTracker . If you wish to have access to the Live Scoring StatT must purchase the StatTracker add on package | |
| | HONDA '91 Accord at loaded runs ex \$2100 650-248-12 | | Schedule - Week 7 Details |
| | HONDA '91 Civic cass 78k at exc o \$3,500 510-520-4 | | Regular Season Rank Team Name: |
| | HONDA '86 Prelude snrf, gas saver \$ (510)220-540 | | Whiners* - match Chifadores Futbol - SR Homechickens* - match Defending Champs.* - SR Longest Yard.* - match HTown* - SR Worst to First **** - match E's Sierra Nevadas - SR The Coolies*** - match steelbambam - SR PISTOL PACKUM - match 49ers At Superdowl - SR |
| HONDA '85 Pre Si 5spd, rebuilt t eng new tires/p \$1,750 obo sun (510)795-676 | | | |

Information has been an important dimension of daily life throughout history. Using clay tablets, pictures, or stories, individuals have developed a distinct relationship to information as part of their daily practice. New technologies, such as writing, the printing press, and computer networks have redefined the value and role of information in society and our relationships with it. Today we live in the “information age” and work in the “information industry.” Our technological tools, devices, services, and even toys employ information to mediate our experiences. In a nutshell, we see the world increasingly through information. Online shoppers can know everything about a product before they buy it. And travelers can learn the most detailed information about their exotic vacation destinations—from looking at the view from their prospective hotel room to examining menus from local restaurants—before they even get there. As one interview respondent mentioned, doing the travel research and previewing the trip is almost better than going.

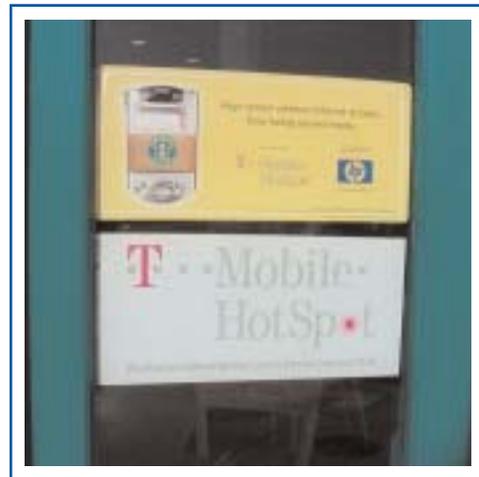
The information and communications technology explosion—driven by innovations in connectivity—set the stage for two tensions that drive many practices and desires related to information work. First, the abundance of information and communications has enabled a new household communications zone. As it expands with new interactions and flows of information, the work required to manage such flows also increases. Households and families can expand their social communications across time and place. They can shop at midnight, have email chat with remote siblings at any time, stay in touch throughout the day, coordinate and schedule tasks from the road, and so on. The new accessibility works the other way too. As householders reach out, others, including businesses, want to reach into the household. Flows of information and communications in and out of the household are abundant and incessant. While defining the scope and boundaries of the household, these flows have created a source of information work: constant vigilance in filtering, screening, and managing communications messages, and decision making about when and how to communicate with others.

The second tension relates to our desire to use information and communication with others to reduce uncertainty across the diverse domains of daily life. The hope is that access to the Web and to social networks through email and mobile devices can make any problem solvable if only for the right url or contact. Indeed, daily life tasks have become framed as a series of information-based problems with appropriate information- and communications-based solutions. Information gathering, assimilation, and sense making is important household work for all members of the household. Householders learn to straddle the tension, however, between perfect information and certainty and the realities and constraints of daily life. A down server or traffic jam can ruin even the most informed plans and calculated schedules.

We anticipate the following shifts in daily practices related to information work over the next ten years as householders begin to adopt sensor-based, wireless technologies.

FROM SCREENING AND FILTERING FLOWS TO FINDING AND FREQUENTING HOT SPOTS

Information work in a 2002 world of boundaries is all about screening and filtering information flows. The current practice focuses on restricting the massive amounts of messages, calls, emails, and communications that are directed to the household and all of the household members.



This is familiar to us all as the practice we all do when we delete email messages, throw out junk mail, use the answering machine to screen calls and so on. We're trying to process the information, make sense of it, and then move on, throwing out what's irrelevant and keeping what is pertinent. This is the practice of controlling who has access to you at different times and places, like at home during dinner time, on the weekend, or even when you're at work doing email and you get personal messages or spam.

In a world oriented by focal points, however, some new information work practices will become a part of householders' daily repertoire. In 2012 information work is a bit different because information is now embedded in the environment, in physical objects. So the practice is about finding and frequenting hot spots—personal information landmarks that exist just for you.

Imagine walking down the street in your neighborhood, and your PDA reads a tag that's been left for you at a coffee shop—the message is from your friend and it says, “Natalie, You gotta try this place, the muffins are great! Lois.”

In a world of smart spots, the physical landscape is filled with digital landmarks that mean something special to you. The new information work is about being aware of them, seeking them out, and orienting your day around them.

FROM WORKING WITH DATA BY THE SCREENFUL TO ACQUIRING INFORMATIVE OBJECTS

Today, information work in a boundary-oriented world is about the screen as the primary interface. In essence, the screen is the mediating boundary between cyberspace and us. The practice of information work requires us to sort through screens in order to assimilate information and communicate ideas. The screen is the organizing principle that frames how we approach and consider that information. It all has to make sense using the screen. Often two dimensional paper formats are the guiding templates for screen lay out of information that may or may not lend itself to the dynamics of interactive information.

A great example of this is how we do online shopping using the screen as the virtual store or supermarket aisle. The screens look like the aisles or at least how we would imagine the products listed by aisle.

Menus and check boxes, common in paper layout are translated to the screen. In our interviews, we heard countless stories of householders trying to navigate Webvan screens, Priceline.com screens, and others to pick exactly which kind of apples or FruitLoops they wanted. Their descriptions of these processes were relentless and painstaking illustrations of the kind of work that it takes to use the screen to make sense of information. This gets even harder with complex information and concepts about new products and services or about new brand messages.

As we move into the world of social objects, the screen interface disappears. Information work isn't about reading off of screens; it's about acquiring informative objects and having direct interactions with them. Information can be mediated through the physical object itself and its properties. In the next decade new technologies will be able to make almost anything a display. Walls, clothing, furniture and other objects can directly express different kinds of messages or relay information by changing their conditions. Complex ideas or concepts (brands, new product concepts, service plans, health status), conditional information, and relationships between types of information or dynamics can be portrayed in more contextually appropriate and dynamic ways.

Imagine weather displays or GPS maps in outdoor clothing like parkas and hiking pants, or cosmetic packaging that changes color to tell you about your skin type and which product will best address your particular skin needs.

The benefit of social objects is that they communicate information in physical context. Change the context and the message may change. The information that objects convey to you is context based and relevant because the object is aware of you, your needs, and the particular environmental context.

FROM PERIODIC COORDINATION TO CONTINUOUS MONITORING AND TRACKING

Coordinating logistics and schedules is a huge information work practice for households today. Our interviews over the years have provided us with hundreds of pages of transcript about this one topic alone. Interviews in 1992 showed household members using car phones and pagers to check schedules with spouses or to report their whereabouts to parents. Interviews in the late 1990s revealed the adoption of email and the Web to coordinate after work activities or check soccer practice schedules. Our most recent interviews in 2002 show householders approaching this coordinative activity as a major piece of household information work. Indeed, one respondent described how coordinating with friends on e-mail for dinner and a movie started to feel like a work task of scheduling a meeting with fellow project team members.

The pain and frustration of this practice relates to the episodic nature of those interactions. Household members continuously check in, update each other, confirm times, places, and tasks, check financial information or shopping lists, and offer new solutions to new logistics problems that emerge. This is not checking in to keep in touch or say hello. It's checking in to verify status and progress of a particular situation or task. In fact, the nature of repeated coordination and scheduling has given household life a just-in-time quality, where improvisation rather than planning is the strategy. Last minute information and updates can trigger changes in plans and new tactics for accomplishing daily tasks.

In 2012, persistent worlds will allow for ongoing presentation or display of information that enables continuous monitoring and tracking. Information will be presented as a continuous stream that can be

expressed in multiple ways to make it easy to monitor and understand the message.

For example, let's say you are shopping for that dress, as we described in the earlier example, and the tags are telling you this dress is the one for you. But you don't know if you can afford it, and you don't want to go into debt. So you check your watch that has two lights, one is for your bank balance and the other is your credit card balance. The two lights flash pink, indicating that you better wait until your next paycheck to buy that dress. Two important streams of information were coordinated and communicated to you in a simple way that was easy to comprehend. The work in this example is to decide which information streams are important to coordinate and monitor.

BUSINESS IMPLICATIONS

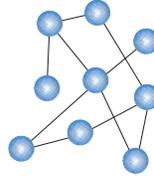
NEW CONSUMER SKILLS AND DESIRES

- **Designing personal information flows.** Individuals will need to learn how to author their own information landscape, keeping some flows invisible (like information about their sources of home energy) and others visible (such as the whereabouts of their children or bank account balances). Individuals will need to do this to prevent information overload and to keep information in actionable contexts. Knowing how to design personal information landscapes will be like knowing how to design and furnish your home—certain furniture and accessories belong in certain rooms depending on their function, inhabitants, views, noise level, lighting, and other conditions.
- **Information orienteering.** This skill is about how to read the environment for signs and cues. Just as some consumers today are really good at scanning screens for specific pieces of data or even sorting through paper files and forms, consumers in 2012 will need to learn to find, retrieve, and navigate information that is embedded in their physical surroundings.
- **Information caching.** Householders in 2012 will need to be adept at placing information in the environment using displays, social objects, and information/communication devices. This skill involves understanding how places and objects serve as focal points, such as the car, the office door, the supermarket cart, or the corner bus stop.

BUSINESS STRATEGIES

- **Map various possible information landscapes that relate to your product or service.** Identify the kinds of information and communications that your product or service may generate or require with consumers and map out possible flows across a household landscape. Identify possible focal points—what do they communicate and through what kind of physical object? What do they connect to?
- **Re-think the communication of brand through social objects.** How can your product or service leverage aware objects to better communicate brand? Do specific flows of information suit some objects better than others?
- **How can consumers create relevant focal points in your retail locations or points of service?** What relationship with your products or services can these focal points support?

5. SOCIAL NETWORKING



Social networks have been an important resource for individuals for many years. From familial networks to good-old-boy networks, groups of individuals connected by a common thread provide a group resource to individual members (see Figure 2). Social networks serve many purposes. One typical purpose is their use under conditions of scarcity. Bad harvests, limited goods in the market, lack of financial resources, or some other kind of constraint make the benefit of tapping into a group network desirable. Social networks are still important for overcoming constraints and situations of scarcity, but they are also important for conditions of abundance. In households today, and continuing in the future, social networks will be important resources for navigating a world of abundant, sometimes confusing, information and market choices.

Figure 2
Georgina's Social Network



Source: Institute for the Future

Social networks make the complex world a more manageable and navigable place for householders. They break the world down into smaller units that interconnect and provide a sense of organization and meaning. Social networks can be based on several dimensions, some of them include: family, values, interests, work, ethnicity, institutions/organizations, geography, physical place, and social roles/identity. (See *Social Networks in a World of Abundant Connectivity*, SR 764, for a more detailed discussion of social networks). These networks help individuals do their information work more effectively as well as many other household daily life tasks by providing trusted relationships, a set of accessible experts, a source of emotional support, and a context for playing out their identity.

Information and communications technologies such as cellular phone, email, other messaging devices and methods, and the Web have facilitated the creation of, maintenance of, and participation in social networks. Indeed, new forms of connectivity and access have facilitated the flourishing of social networks and their role in householders' lives. The reach of social networks has become wider by bridging geographical distance. The scope of social networks also has broadened by the creation of more diverse ties and connections through online communication. Diverse social networks exist side by side in the electronic world, whether they are intimate family networks or one-dimensional, hobby-based networks. The likelihood of random connections and weak links bridging otherwise distant worlds is greater. This increases the circulation of ideas and can speed up the adoption of innovations, new products and services.

As we move into a world of sensors, wireless connectivity and mobile computing, the practices of interacting with social networks will evolve, as will methods of forming and sustaining them.

FROM MANAGING CONTACTS TO SWARMING

The practice of social networking in 2002 requires householders to manage and maintain a spectrum of contacts and interactions. Information and communications technologies help do this by providing choices for how to interact with particular people in social networks. In fact, choosing which communication method to use for different contacts is an important component for managing social networks. Different communications methods allow for different levels of richness in communication and they set the context for the interaction.

For example, one of our interview respondents developed the practice of forwarding all the calls from an annoying insurance agent to his home phone so that his wife could deal with it. He didn't want that piece of his social network to appear at work, so he used his technology to bounce that particular contact to his home, and ultimately to his wife. Other respondents told stories of how they requested certain family members or friends to email them rather than call them, so that they could respond from work. One young professional woman described how she started her workday at work with a group email with her girl friends who are distributed across the country.

Focal points change the nature of social networking. In 2012, we'll learn how to make our networks take action. We'll learn how to swarm. Swarming is a practice that uses technology to bring the network together—to create a focal point of convergence in order to take an action or make a statement as a group. It is an example of getting in synch with the network in a particular place. That place could be physical or electronic.

Imagine being at a shopping mall in 2012 and there's discount at the Foot Locker shoe store—five pairs of Nikes for the price of three. But you only want two pairs. You tag a few key spots at the mall with a message stating that you're looking for other shoppers interested in getting the Nike discount and to meet at the Foot Locker in the next 15 minutes. An emergent swarm of interested shoppers are able to take advantage of the discount. You're happy and so is the Foot Locker, and Nike of course. Here, the social network is a loosely connected group of shoppers who share the desire for Nikes at a bargain price. The web is able to link networks like this bridging the distance among the members. Adding sensor-based tags and wireless communications means that the disperse group can be contacted and brought together in physical place.

In this example, the practice of social networking is about understanding and using the power of emergent congregation and collective action. In the next decade being able to activate networks to take collective action in physical or electronic space will be a useful household skill. This will be applied to serious issues in domains such as health or education but also for more mundane, routine tasks like shopping or recreation.

FROM BUILDING A VIRTUAL COMMUNITY AND LIFE TO FORMING MACHINE PARTNERSHIPS

In today's world, virtual space, or cyberspace, is another outlet for us where our entire social life can unfold if we want it to. It's a place where we build community, we work and play, we entertain ourselves, we buy and sell things, and do just about anything we do in the actual world. Remote relatives can see little grandchildren grow up in digital pictures sent via email, teenage girlfriends and boyfriends break

up and make up online, and elderly spouses can develop their skills as caregivers by participating in communities like Alzheimer's Journey, an Alzheimer's caregiver's community (www.alzheimersjourney.com).

Likewise cyberspace has provided us with an alternative dimension for carrying out our social networking. Many of the network management practices so important to developing social networks are conducted in cyberspace through e-mail, cell phones, Web chat, Web logs, and Web sites. Practices such as recruiting members to social networks, watching the interactions of a social networks, learning and modeling behaviors from social networks, and introducing one social network to another (grafting and colonizing networks) take place in cyberspace. There is no doubt that cyberspace is a vibrant part of our lives.

As we approach a world of social objects in 2012, social networking doesn't just take place in cyberspace, it also takes place with social objects in the physical world. In essence, machines and objects become our partners in household life. They become members of the household social network. This will increase as we offload more work, tasks, and decisions to devices and objects that can do the thinking or responding for us.

Imagine the household vacuum cleaner that roves around on the floor by itself, adjusting to the hardwood floor and then to the thick shag carpet as it picks up crumbs and dust. It turns on and off when you call for it and it automatically turns on the central air purifier when it detects new bacteria in your house.

The machine has become a member of the household by the function it performs and the responses it can undertake on behalf of the family even though it may be very specialized and narrow in scope. It has a job and a role in the network of household roles and functions. Other household appliances and devices can similarly take on other roles and functions as our partners in running and managing the household.

FROM SHARING SLICES OF LIFE TO CREATING PERSISTENT COMPANIONSHIP

The practices of social networking today are shaped by the episodic nature of our interactions. We share little slices of life as we exchange email messages, digital photographs, short videos or even phone calls. The social network gets informed about daily life events and milestones in installments. This creates a sense of membership and belonging that is somewhat fragmented—bits of detail or nuance get filled in with the imagination or by a deep experience base and knowledge of the other people in the network.

Persistent worlds in 2012 offer a bit more continuity to the cohesion of the social network and the nature of membership. Persistent worlds allow for new forms of continuous companionship. Ongoing connections and messaging can create a sense of linkage, using images, sounds or even scents.

Imagine it's dinner-time and you think you are going to have to work late. You get an instant message from your spouse, but instead of seeing a text message, you hear your daughter babbling in the background and you smell the lasagna in the oven. You decide it's time to go home. The sense of companionship is extended by having other sensory inputs to your messaging. The family presence is shared.

For other kinds of networks this means that new kinds of cues and signals can be shared to activate a network, to bring it into action. Combined with more continuous streams of communications from members in the network, this offers new ways to tap into the continuous support of a network or to monitor a particular network. The activities of the network don't have to stop when you aren't paying attention. Of course, this brings up the issue of what the new etiquette is for how to say you might not want that level of companionship. Nevertheless, persistent worlds allow social networking to take on new forms of intimacy and thickness in the relationship, perhaps turning more one-dimensional connections to richer ones.

BUSINESS IMPLICATIONS

NEW CONSUMER SKILLS AND DESIRES

- **Decision-making for offloading work to machine partners.** Aware objects can offer householders support and expertise in various household tasks. A new skill will be negotiating what kinds of information and communications work machine partners will engage in. The risk is that households become over automated organizations with household members as mere cogs in a bigger automated operation. The dark-side of these machine partnerships evokes images of the dark robot factories and loss of control of basic household tasks and functions to machine partners. Indeed, it is the repetition of familiar daily tasks like setting the table, cooking meals, and making the shopping list that contribute to making a house really feel like home. Householders will need to learn what the right balance of work and responsibility is for the people and machines of the household
- **Development of protocols for not abusing presence.** Two is company and three is a crowd. Technology applications that support persistent presence and continuous relationships can be abused. Over exposure to people (and machines) can wear and strain relationships, not to mention chip away at privacy. Householders will need to learn how to develop the protocols for negotiating exposure and presence. They will learn how to request presence and signal for privacy and inaccessibility.

BUSINESS STRATEGIES

- **Design your products and services as welcome partners in the household social network.** Make accessibility and communications to people and aware objects flexible and customizable. Develop ways for your product or service to use or be machine partners in unobtrusive ways.
- **Design consumer interactions and processes to accommodate swarms.** How can you design service processes, help lines, product request processes or in-store interactions to accommodate swarms of consumers?
- **Examine swarms as temporal market segments.** Track how householders swarm in different domains of their lives and identify how these translate into possible markets. What are the triggers that activate swarms in different domains? What do the swarms typically want or do collectively?

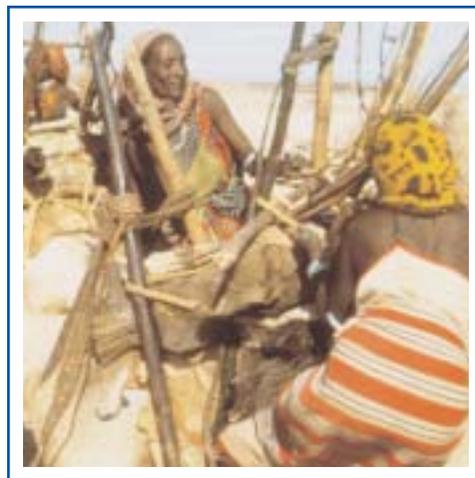
6. MOBILE LIFE



Mobile life is a new zone in the household landscape—it's not home, nor work; not one place nor another. Mobile life takes place in the in-between places and in the moments of transience and transition. It is the border, or buffer zone in between activities and conversations. Niches of time and place—in the car, on the go, on the run, on the way, just before and just after—once considered empty or non-productive are now vibrant contexts for activities of all kinds. Mobile life is a significant domain of household daily life that is explicitly integrated into the broader household landscape. Almost one-third (29%) of respondents in IFTF's 2002 Household Survey reported that they do personal or work tasks while they commute to work by car, train, bus or other means. For those householders who are responsible for managing many domain areas of their household, this percentage increases.

Mobility in the information age is a new kind of mobility. It is an untethered yet connected mobility that has impacts for those who are moving about and for those who stay put. Being mobile doesn't mean total separation from one place or context, but rather being in transition zones that connect various places and contexts of daily life. It creates a new relationship (and tensions) between those who are mobile and those who are anchored.

The shift to technologies that highlight focal points, social objects and persistence will shape the nature of mobility and the practices of mobile life.



▲ Gabra Women Striking Camp

FROM NAVIGATING BOUNDARY DISTINCTIONS TO DEVELOPING CENTER-PERIPHERY RELATIONSHIPS

The advent of computer connectivity, particularly enabled by the Web and e-mail, removed physical place as a constraint for where and when to do certain household and work tasks. During the 1990s, online shopping allowed householders to purchase goods and services of almost any kind from the privacy of their home and any hour of the day or night. Likewise, paid work normally conducted at the office could be performed at home, on the road, or any other location so long as the network connection provided access to necessary resources. This set up an issue of eroding traditional work and home boundaries, and created the need for individuals to be able to establish their own boundaries that communicate explicitly to others whether they were working, playing, shopping or doing something else. Our interviews in the past few years show householders are very sophisticated at using specific technology devices, time periods, and places to create new boundaries to define their activities to others. Tensions emerge when a boundary is crossed but behavior is not concurrent with the world on the other side of the boundary.

The assumption in current boundary management is the exclusivity of boundaries themselves. Boundaries, by definition, identify what is included or excluded from a particular space (time or physical). It requires individuals to turn on and off relationships, roles, identities, and information and communications flows. This is the difficult work of context switching discussed in Chapter 7.

In a sensor-based world of focal points, relationships and activities will not be defined by the exclusive in/out distinctions of boundaries but by the relative position to the center and periphery. For example,

Peter Wilson describes how in hunter/gatherer societies individual kinship relationships change depending on focal-point relationships (See sidebar on page 11 for more information on Wilson). Kinship connections become more clearly defined the closer people are located to the campfire or hearth—the center. Out on the periphery, they diffuse and their meanings change. “Beyond, as the range increases, kinship is a reservoir of potential but undefined (or increasingly vaguely defined) connections.”

In 2012, hot spots of information and connectivity—a physical tag on a piece of clothing that responds to you, a wireless node in a café, or a specific appliance in the kitchen—will act as focal points that shape behaviors and interactions. Focal points can be key technology devices, key social contacts, or key physical landmarks where people, information, or other resources converge. As opposed to boundaries, focal points cover the householder’s daily life landscape, and they can be carried along. Therefore, the flexibility of creating a point of orientation for certain kinds of interactions and practices increases. Imagine you set your cell phone to a certain setting to only receive personal phone calls—it becomes a focal point for your personal and family interactions. Or imagine you enter the footprint of a wireless Internet node on Tuesday at 10 a.m.—this becomes a focal point for your work interactions for a period of time. The work of this practice is about relating to various focal points in the environment to orient your interactions and relationships as you move through your day. It means assigning new meaning to places and objects that set up a context for you.

FROM TRANSPORTING RESOURCES TO SEEKING THEM OUT IN THE SURROUNDINGS

Mobility in a world of social objects transforms the kind of nomadic practices related to resources. In many ways, the next decade will be a return to nomadism in an entirely new electronic and aware context. In the current world, our mobility is characterized by carrying around our resources with us. We lug laptops, cell phones, PDAs, even portable printers and other digital and communicating devices. The current road warrior, either professional or domestic, is really more like an astronaut who travels around with all of his life sustaining resources. Notice how many devices and gadgets business travelers take with them. Look at what kinds of devices full-time moms carry with them in their cars.

In the next decade, the practice of mobility will be characterized by the traditional nomadic practice of carefully reading the environment for signs of resources, opportunities, and threats. In a landscape embedded with social objects, tags, and aware objects, householders will be looking for signs and cues in the physical setting that tell them: “You can work here,” “The shoes you wanted are on sale here,” “This space is setting off your allergies,” or “Here is the shopping list you forgot at home.” Depending on their needs and desires, householders will navigate this landscape by the focal points they encounter.

FROM TRANSITIONAL CONNECTIONS TO CONTEXTUAL PRESENCE

Niches of time and space on the run and on the go often provide a transition between two anchored places. Mobility then is often used today as a transition zone. Today householders call home on their way from the office to ask if they can pick up anything at the store. Teenagers message their friends using cell phones or other text messaging devices in-between

seeing them at school and then again at their homes. Workers also use the in-between moments to research the client they are about to see or the product they are about to buy from a vendor.

Persistent worlds in 2012 will allow mobile individuals to maintain presence while they are on the go. Rather than tapping into cyberspace and having a brief episodic interaction, individuals will be able to selectively manage the continual presence of colleagues, family members, or other important contacts in their social networks.

Imagine a video conversation with a colleague, or household member, that followed you as you moved from café, to car and then to your next destination. Or a continuous display of real time photos from your children or older parents as you traveled from one place to another. The key insight here is how to develop the selectivity to appropriately maintain the presence of certain individuals (or machines) in a household or professional network. New social protocols will emerge around this practice as it relates to privacy and control issues.

BUSINESS IMPLICATIONS

NEW CONSUMER SKILLS AND DESIRES

- **Setting up camp.** In 2012, individuals will hone their skills at creating a context for home, work, or other activities across various settings. Using personalized landmarks, seeking out resources, and selectively managing presence, householders will be able to create personal and meaningful places, times, and interactions to support their domain needs.
- **Creating sanctuary and refuge.** Increased mobility and a boundaryless life require new ways to negotiate privacy from the world. As the external, physical world becomes more a part of the foreground of our lives, householders will want strategies to carve out privacy and refuge from the public. As author Maggie Jackson suggests (*What's Happening to Home*, 2002), individuals need to create sanctuary in a world of always-on connectivity and flexible boundaries.

BUSINESS STRATEGIES

- **How can your product or service become a resource embedded in the physical environment?** What are the critical components of your product or service that are resources for consumers? How would these resources have to change to be meaningful on the go or in between anchored locations?
- **Design communications and interactions with consumers for alternative locations.** Play out your core interactions and communications with consumers in multiple settings. How do they work in non-home settings, non-store layouts, public environments, or mobile settings (in the car, public transportation)?

7. IDENTITY CREATION



The fourth domain of household activity that we will consider is identity creation. As past IFTF household technology research has shown, technology impacts identity creation in two key ways. First householders use technology devices and services themselves as artifacts to reflect certain attitudes or status. Technology as plumage is a powerful motivator for using technology either to set those who believe they are unique apart from the rest, or to help some, such as the middle class, join in the mainstream techno-culture. Individuals employ technology to reflect their identity and also rely on it to read and interpret others' identity.

Technology also is a vehicle for allowing individuals to express their identity through media—that is, through email messages, web log entries, digital photographs, video images, web sites, list serves and other forms of communication. In fact, using technology to participate in various social networks, as described earlier, is one way to develop various aspects of identity. As information and communications technologies have allowed us to cross all kinds of boundaries (cultural, geographic, time, etc.) working of the self in the various contexts has become an important household domain. Indeed, creating and presenting the “appropriate” identity for the context is an important strategy for individuals in their personal lives as well as their work, professional, and public lives.

Technological shifts in a world of focal points, social objects, and persistent worlds will transform the ways that individuals can work on the self and manage identity in their day-to-day practice.

FROM SWITCHING CONTEXTS TO READING PERSONALIZED SIGNS AND SIGNALS

The practice of context switching requires a person to shift their mental and emotional frame of reference to deal with new kinds of interactions. Switching from one social network to another (a new set of relationships, roles and tasks) or conducting an interaction in transit (taking a work call while out of the office or outside of work hours) often create the need for context switching. For example, if the respondent mentioned in the earlier example actually took the call from the annoying insurance agent at work, he would have had to shift his frame of reference from his work context to his personal context. That means switching from thinking about his coworkers and colleagues to his family and relatives. It means shifting from his job roles and responsibilities to his household related roles and responsibilities. It means he would have had to bring forward a particular slice of his identity and create a new basis for handling the interruption.

Context switching is a big deal for householders because it happens repeatedly over the course of the day and with every single communication channel we have. The source of stress comes not necessarily from processing large amounts of information, but from locating the interaction in the appropriate social and household context—for example, Who is this person? What is my relationship to them? What is my role in this interaction? What is the history of this interaction? and so forth. The 2002 IFTF Core Survey shows that as people manage more domains of household activity they are more likely to experience stress 5-7 days a week. Also, those with responsibility for lots of household domains, were more likely than those with fewer domains to allow businesses to contact them with updated product and service information. This suggests that household stress is as likely related to the amount of context juggling, switching

mental and emotional frameworks, as it is from doing the actual tasks. There is really an art to the practice of context switching.

In 2012, a world of focal points will change this practice as the context becomes aware and can switch to your needs. This is possible because the environment is responsive to you. In it's simplest form, imagine arriving home from work and your cell phone no longer rings if it is a solicitation or a work call. The phone knows you are physically at home and not taking those calls. Or let's say you are shopping and you're looking for a new dress. The clothing tags would recognize you, know your size, and change color as you approach the rack—gray would mean that the color is neutral for you, red means it is a great color on you and black means forget it, don't touch it. In this example, the environment is in synch with you and provides you with information that is relevant for you at that time and place. Rather than manually filtering and placing information and interactions in context, some of this will be done automatically for you.

FROM MANAGING VIRTUAL PERSONAE TO CREATING A CHAMELEON BODY

Individuals today can use the Web, for example, as a virtual space to develop and play out identity. Cyberspace allows householders to emphasize certain sides of their personality or role-play entirely different characters in the context of shopping interactions, online games, alternative social forums, and other situations.

In an IFTF study on identity in cyberspace, one respondent stated that she had two main “avatars” or personae in a virtual community that she inhabited in cyberspace. One was called April Breeze, who was outgoing, joked a lot, and talkative. The other was Sandy Shore, who was quiet, and as it turned out made a lot more friends. Both were important components of her daily life.

In a world of social objects, identity creation in the physical world takes on new possibilities. With social objects, the digital and physical worlds get fused, or integrated in one place. That one place could be an object or it could actually be your own physical body. The body becomes a chameleon expressing shades of identity.

Here is one way this practice might look in 2012. Body paint or makeup that is laced with tiny sensors could react by lighting up in different colors when your body heat reaches a certain temperature or when you come into a light or dark room. In a sense this is a new kind of digital tattooing. The idea here is that rather than play out and create your identity in cyberspace, you can put aspects of your identity, or markers of your identity into the physical world.

FROM MANAGING A FRAGMENTED SELF TO MAINTAINING A PERSONAL PRESENCE

The work of identity creation undergoes a transformation as we experience the shift from episodic interactions to persistent worlds. Identity creation gets fragmented across episodic interactions and across various tools. In developing personae or characters in virtual space, individuals reveal bits of identity over time. Think about all the profiles that you create when you sign up for a service or you set your preferences for an interaction online. All those profiles are bits of your identity that get fragmented

across various interactions and services. The richness of your identity is revealed over time and over the course of those multiple interactions on various services. Now this may be desirable to you, but the work necessary to manage your identity is not insignificant.

Creating identity in persistent worlds is a bit different because you can create lasting presence across places and tools. For example, you might want to place your voice into objects, like one of your children’s favorite bedtime books, so that when you’re not physically there, a part of you is there. Or, you may want to send periodic updates to the electronic picture frames of your family that cover the wall of the den in your parents’ home now that your parents are older, not as mobile, and don’t visit much anymore.

The idea is that aspects of identity are flexible and can be made to persist so that personal presence is experienced.



▲ Storytelling

BUSINESS IMPLICATIONS

NEW CONSUMER SKILLS AND DESIRES

- **Managing identity in relation to focal points.** Householders will learn to manage their identity and relationships with others more flexibly as they approach various focal points in their own daily landscape. As they wear certain devices, approach particular information hot spots, and connect with specific social networks, they will learn to express themselves in new ways to reflect their identity.
- **Householders will learn to live with distributed and persistent identity.** Individuals will learn to create, place, and manage cues and signs of their identity and presence in objects and devices.

BUSINESS STRATEGIES

- **Design ways for products to signal to consumers and their machine partners.** Provide opportunities for product and service information to become customized to consumers and the machine partners that perform information- and communication-based tasks for them.
- **Design products and services for maximum customization to reflect consumer identity.** Consumers like to create, maintain, and develop their identity through their technologies, products, and services. Look for ways to allow consumers to embed the important aspects of their identity in your products and services.

8. CONCLUSION



A NEW NOMADIC DAILY LIFE IN 2012

The new landscape for daily life in 2012 will be characterized by the ways that householders orient to new kinds of focal points in the physical environment, develop relationships with social objects, and manage presence in persistent worlds. By examining the practices that are possible in the next decade, the outlines of a new kind of nomadic daily life are emerging. This is a move beyond virtual nomadism, whereby individuals travel across and inhabit various virtual worlds. Nor does the new nomadic life of 2012 suggest a rootless transience and lack of a home base or personal refuge from the world. The new nomadic lifestyle will marry the flexibility of focal points, the personal meaning of presence, and a new relationship with social objects to create a new lifestyle that explores new relationships, intimacy, and meanings of home, community, and work.

In Wilson's book, he describes how, with domestication, permanent architecture embodied time and occupied space. Indeed, time became anchored in space. This provided a repetitive pattern that dictated the rhythms of life and relationships of people. "Time becomes repetition and recursiveness—the same things happen at the different times in the same place." Hunter/gatherers, on the other hand, "chase time from place to place to follow the ripening schedules and animal migration timetables, watering habits, and seasonal availability. But when they settle, time passes through place, place receives time and the two merge." In 2012, the new nomadic householders will experience a disconnect of time and space as borders erode from enhanced connectivity. But as the new hunter/gatherers, they will experience information as it passes through place and the actual and virtual worlds merge. The pioneers of the new nomadism won't simply live mobile lives with multiple anchor points. They will explore a new territory with new rhythms, cycles, and pathways that traverse an integrated physical and electronic daily landscape.

USING THE FRAMEWORK TO ANTICIPATE DAILY LIFE IN 2012

The compass framework presented here can be used in several ways to anticipate future household and consumer practices, desires, and fears. There is no one way to use the compass or one version of it. Each layer of the compass is customizable and can be used with more detailed questions or issues. It will continually be filled in with new domains, sub-domains, and daily practices as it is used. A richer compass will provide more insight and deeper understandings of households and consumers.

Here are a few ways you might want to use this framework:

- **Place specific technologies, applications, or products in the center.** Core issues related to specific technologies or technology applications can be placed in the center as the launching point for using the compass. The compass can then be used to examine daily practices by household domain at a more specific level.
- **Examine a specific domain in-depth using the compass framework.** Pick a domain that is central to your business and use the compass to explore it in depth. How will various core technology issues shape the context for new practices that will effect your market? How is your domain related to others? What specific interactions with family, community, workplace and business yield the most significant practices related to your product or service? (Companion report, *Technology and Daily Life: A Spotlight on Entertainment*, SR-788 B, provides an example of how the framework can be used in this way).
- **Use the compass to navigate cultural and regional differences in the adoption of technologies.** It can also be used as a way to understand how specific practices and domains will evolve across various countries, regions, and cultures, such as teenagers, and ethnic groups or the online game world culture.
- **Use the compass framework to examine how your product or service cuts across domains.** The compass framework can show how domains are related to each other through practice and interactions with community, family, workplace, and business. Develop an understanding of the breadth of practices related to your domain, say health, and how the intersections could expose new opportunities to expand your market.
- **Explore particular kinds of practices.** Use the compass to look for specific kinds of practices, such as those related to customer or consumer communications. How do these practices differ or remain the same across domain areas?