CONSUMERLAB

ERICSSON

INTERACTIVITY BEYOND THE SCREEN

Consumer expectations of the internet of things

CONTENTS

UNDERSTANDING DIGITAL 3
THE INTERACTIVE SCREEN AGE 4
THE CONSTANT YET EVER-CHANGING CLOUD 5
USING SENSORS TO MIMIC THE INTERNET 6
THE MOBILE INTERNET OF THINGS 7

INTRODUCTION

We spend more time in front of screens than on any other activity, so our fundamental views on the physical world are changing. This report collects insights from several recent projects with a view to exploring how consumers are starting to think about the world as an internet of things.

KEY FINDINGS

- **Computers and the internet initially mimicked the physical world**
  Until now, digital environments were designed to reflect the actual world, in order for us to understand them. But consumer acceptance of the cloud shows that people are gaining an understanding of the internet on its own terms
- **Firsthand experiences are increasingly via screens**
  People are now exposed to screens from a young age, so the relationship between screen and physical experience is being reversed
- **We now want the physical world to mimic the internet**
  There will be a growing expectation for the physical world to be as interactive as our screens. Things should respond to touch and be able to handle information

THE VOICE OF THE CONSUMER

Ericsson ConsumerLab has close to 20 years' experience of studying people's behaviors and values, including the way they act and think about ICT products and services. Ericsson ConsumerLab provides unique insights on market and consumer trends.

Ericsson ConsumerLab gains its knowledge through a global consumer research program based on interviews with 100,000 individuals each year, in more than 40 countries and 15 megacities – statistically representing the views of 1.1 billion people.

Both quantitative and qualitative methods are used, and hundreds of hours are spent with consumers from different cultures. To be close to the market and consumers, Ericsson ConsumerLab has analysts in all regions where Ericsson is present, which gives a thorough global understanding of the ICT market and business models.

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UNDERSTANDING DIGITAL

Familiar environments

Picture yourself in your home office. To your left the wall is dominated by a filing cabinet full of drawers and on your right there is a bookcase. The sun is casting shadows through large paned windows behind you, and in the middle of the room there is a large desk with various writing utensils. You walk over to the filing cabinet, open one of the drawers, pull out a document and decide to file it into another drawer. You then sit down at the desk, pull out a white sheet of paper and write a few sentences. You soon crumple the paper and throw it into the waste paper basket, repeating this until you achieve more satisfactory results.

This scenario has been familiar since the 1520s, when the home office, known as a study, became a fashionable household feature with upper classes in Europe. For the past 500 years, everyone from the Italian Duke of Ferrara to the modern consumer has been using the office in the same way. That is until 1984 and the commercial introduction of computers with graphical user interfaces. Now, these actions have gone digital, and users work on Macs or Windows computers, completing their work by pointing a cursor and tapping on keys.

Making use of metaphors

Interaction designer and author Dan Saffer, said: "No one addresses his computer without some metaphoric mediation; we do not speak machine language. Metaphor provides us with the means to understand our complex digital devices."[1]

In other words, since the digital domain basically consists of an endless row of 0s and 1s, we need to model our digital tools on physical realities in order to provide familiar reference points. When working on a computer, the office features mimic their real-world counterparts so that we can clearly understand what we're doing. The desktop reflects the work desk, we think of the data we manipulate in terms of paper documents, and a trash can illustrates things that are thrown away. Even the window is a key part of our digital office, becoming the frame within which we work.

These references to the physical world are the basic metaphors we use when working with computers and the internet. They draw on 500 years of human experiences and have been remarkably stable. But new generations are not growing up with traditional writing desks, so the metaphors are changing.

[1] Dan Saffer, The Role of Metaphor in Interaction Design, Master's Thesis, The School of Design, Carnegie Mellon University, 2005

THE INTERACTIVE SCREEN AGE

A big part of our lives

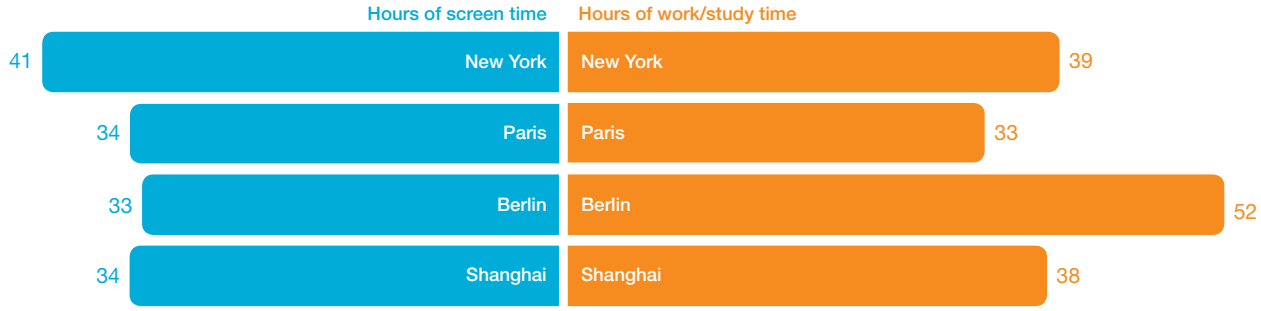
TV has had a major impact on culture and society, so it could be argued that society entered the first screen age back in the 1950s. However nowadays not only do we have multiple screens, but since around 2011 we increasingly use all of them interactively.

In 2011, we asked smartphone owners in New York, Paris, Berlin and Shanghai to judge how much time they spent on 33 different activities – ranging from meditation and religious activities to grocery shopping, household chores, cooking, meeting friends and keeping fit.

The respondents were aged between 18 and 49, which explains why work and study were a big part of daily life. However, Figure 1 shows that in New York and Paris, more time was spent in front of screens than on any other activity, surpassing total working time.

The situation is similar in Shanghai, although work/study time is still slightly higher than overall screen time. Although screen time in Berlin is on a par with the other cities, the average total work/study time is still much higher here. However, since we only asked about internet time, and much work today is done on computers, it is possible that screen time may be higher in Berlin as well as the other cities.

Figure 1: Weekly number of hours spent in front of screens compared to work or study



Base: 1,600 smartphone users in New York, Paris, Berlin and Shanghai, aged 18-49
Source: Ericsson ConsumerLab Analytical Platform, 2011

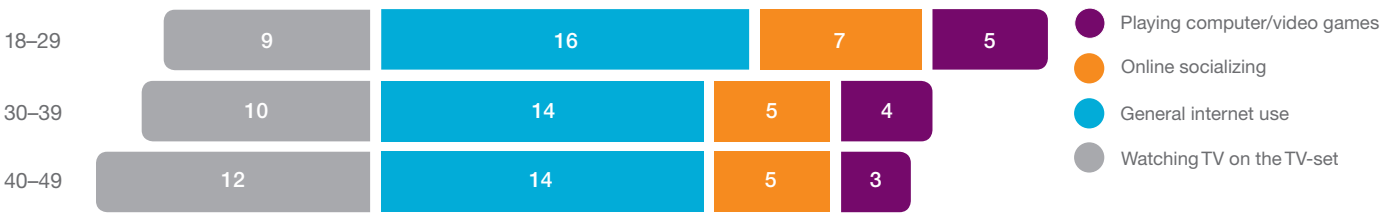
Screen time is internet time

Figure 2 shows that among 18–29 year olds, total screen time was higher at 37 hours per week. This is compared to 33 hours for 30–39 year olds and 35 hours for those aged 40–49.

But most importantly, our screen activities are changing. The 18–29 age group spent an average of 6 hours more on games and the internet than the 40–49 year group, while at the same time spending 3 hours less watching the TV. This indicates that the younger we are, the more time we spend with interactive screens and the less with passive screens.

In fact, the more we use interactive screens, the more likely we are to experience things via screens rather than in the real world. The younger we are when doing that, the more it will form our expectations of what the world should really be like. Therefore, we are increasingly expecting the world to be interactive even when we are not experiencing it on a screen.

Figure 2: Weekly number of hours spent doing activities in front of a screen



Base: 1,600 smartphone users in New York, Paris, Berlin and Shanghai, aged 18-49
Source: Ericsson ConsumerLab Analytical Platform, 2011

THE CONSTANT YET EVER-CHANGING CLOUD

The impact of the cloud

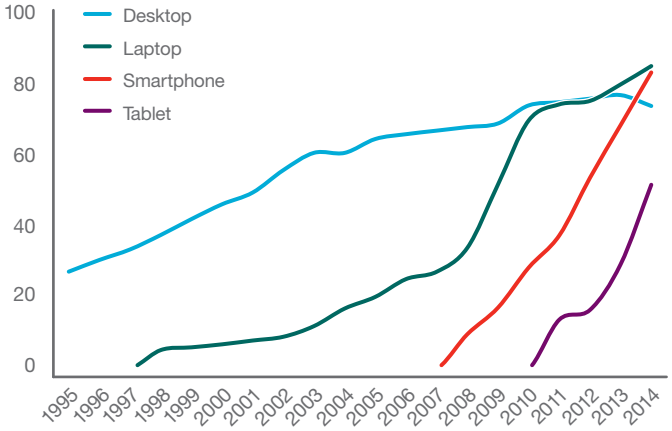
Documents and trash cans are part of our physical world and we have all used them. The cloud is a different kind of metaphor. Although a cloud always changes, it also in some sense remains the same. In that way, it serves as a metaphor for our experiences of the internet as a whole – constantly changing, expanding, becoming faster, offering new functionality, yet always staying the same in essence.

In the past, consumers resisted the need to update tools such as word processors or other software because this change was perceived as meaningless since the end products, e.g. documents, did not change in any way. But with the cloud, any concern about installing new versions of things diminishes. Instead we use seamlessly updated cloud apps, and explore their evolving functionality whilst using them. Learning new tasks therefore becomes seamlessly integrated into everyday life because we learn simply through interaction. By rapidly increasing the volume of interaction, consumers are now in the process of developing an experiential understanding of the cloud and find it easy to use, to the point that we can talk about how cloud reliance influences our device needs.[2]

The use of cloud services is inherently connected to the rising use of multiple devices that need to be synchronized, coupled with the fact that many mobile devices have limited storage space.

Figure 3 shows the rapid uptake of increasingly mobile devices in Europe, and we see similar patterns in other regions. Figures 4a and 4b show the corresponding surge in mobile internet use among mobile phone owners for both social networking and browsing – showing an unprecedented increase in our overall number of cloud experiences starting around 2011.

Figure 3: Percentage of people who have access to a device in their household



Base: Population aged 15–69 in 8 European countries (France, Germany, Italy, Spain, Sweden, UK, Czech Republic, Poland)
Source: Ericsson ConsumerLab Analytical Platform, 1995–2014

Figure 4a: Percentage of respondents who use social networking on mobile phones on a daily basis

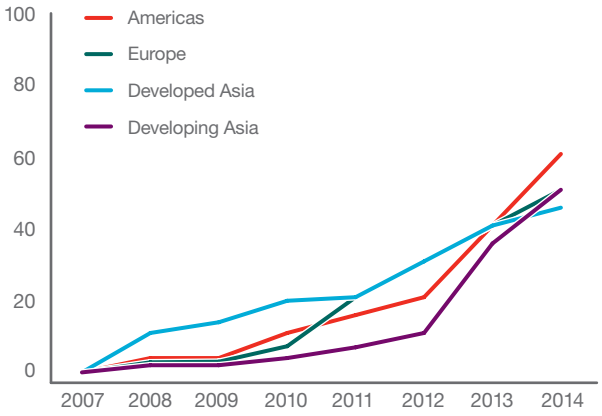
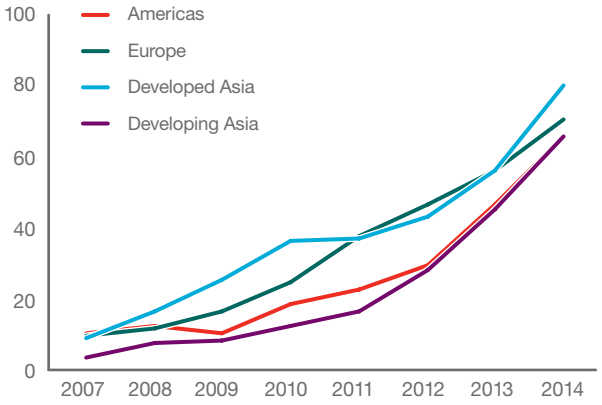


Figure 4b: Percentage of respondents who browse the internet on mobile phones on a weekly basis



Base: Mobile phone users aged 15–69 in the Americas (Argentina, Brazil, Canada, US), Europe (France, Germany, Italy, Spain, Sweden, UK), and Developed Asia (Australia, Japan, Korea). Mobile phone users aged 15-64 within tier 1–3 urban areas in Developing Asia (China, India, Indonesia)
Source: Ericsson ConsumerLab Analytical Platform, 2007–2014

[2] Cloud reliance reshapes device needs, Ericsson ConsumerLab, 10 Hot Consumer Trends 2013

USING SENSORS TO MIMIC THE INTERNET

Now that we are becoming used to exploring cloud services while using them, we increasingly expect to be able to do the same with physical things in our surroundings as well.

Sensors in a daily internet of things

In recent research, we found that consumers expect a 50 percent increase in the availability of apps for shopping, restaurants, leisure, child/elderly care, communication with authorities and transport over the next 3 years. Apps can make these sectors physically interactive, potentially transforming all aspects of daily life. Interest in sensors was equally high, confirming the idea that consumers do indeed believe that an internet of things is about to develop. Sensors are expected to be used in everything from healthcare and public transport, to cars, homes and our places of work. 66 percent of smartphone users predict that doors and gates at work that recognize you and automatically open will be widely used within 3 years.[3] However, sensors also open the possibility for intrusive situations. For example, the idea of in-store sensors that make purchase recommendations was not welcomed by consumers.

Connected care

An interesting example of consumer interest in connected things is containers for food and medicine that can communicate how much is left in them via the internet. 38 percent of smartphone-using young couples/parents said they would use a connected food and medicine service that provides real-time consumption updates from daycare and elderly care centers every day.

38%

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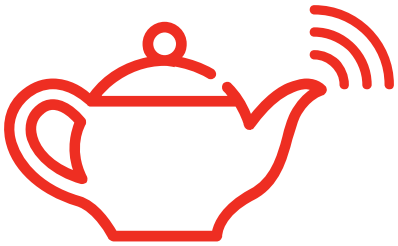
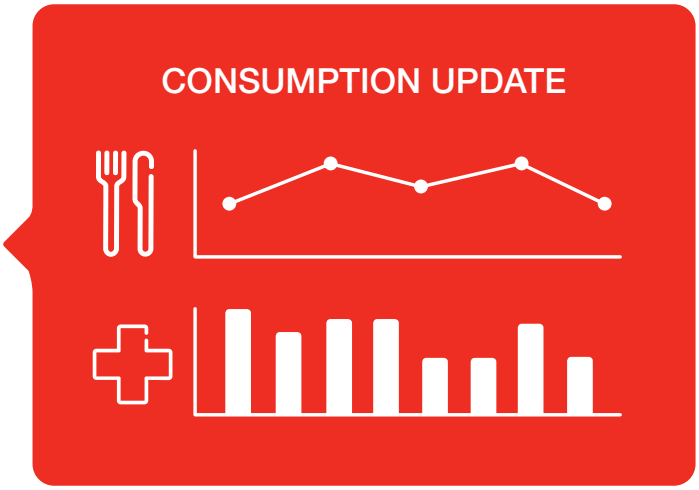




Base: 7,500 iPhone/Android smartphone users in Tokyo, Beijing, London, New York and São Paulo
Source: Ericsson ConsumerLab Analytical Platform, 2013

[3] Sensors in daily places, Ericsson ConsumerLab, 10 Hot Consumer Trends 2014

THE MOBILE INTERNET OF THINGS

Interactive delivery

It is not only fixed installations that are expected to exhibit connected behavior, mobile things will too. For example, this would apply to products that are being transported to customers. 67 percent of smartphone owners said they are interested in a same-day delivery service that works on any device, online and in stores. Purchases should be waiting in the hallway when consumers get home, or in the trunk of their car in the shopping mall. In order for this service to be possible, personnel would need an electronic key to authorize the delivery. Sensors on doors and trunks would then recognize the key and open for purchased goods.

Base: 7,500 iPhone/Android smartphone users in Tokyo, Beijing, London, New York and São Paulo. Source: Ericsson ConsumerLab Analytical Platform, 2013

67%

are interested in a same-day delivery service that works on any device, online and in stores

Self-driving cars

The final example involves cars that can travel autonomously. Our research showed that 47 percent of smartphone owners want a self-driving/parking car that allows you to get out and let the car park itself. As many as 43 percent would use this type of car every day.

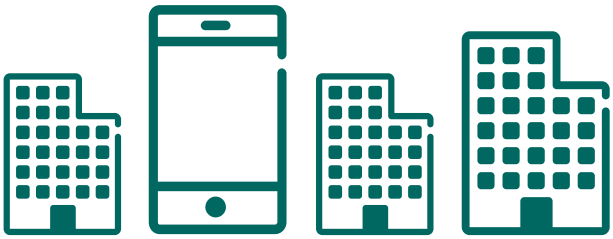
Just like a cloud service, consumers may also appreciate it if car functionality gradually evolves, for example adding ride-sharing functionality to handle issues with traffic jams caused by unmanned cars looking for parking spaces.

47%

want a self-driving/parking car

43%

would use this car everyday



Base: 7,500 iPhone/Android smartphone users in Tokyo, Beijing, London, New York and São Paulo. Source: Ericsson ConsumerLab Analytical Platform, 2013

CONCLUSION

Society is at a crossroads regarding our understanding and expectations of how the internet integrates with the physical world.

Many city dwellers spend more time in front of screens than on any other activity, and connected screen time is increasing, particularly for younger generations.

We are leaving older metaphors such as those for desks and filing cabinets behind, and are beginning to understand digital devices as being connected to a cloud that although always changing, essentially remains the same.

Cloud services are driven by the rising use of multiple devices that need to be synchronized, as well as the fact that many mobile devices have limited storage space. As we get used to exploring cloud services while using them, we increasingly expect to be able to do the same with physical things in our surroundings as well. Privacy issues will likely be debated as this occurs.

It is clear that our expectation for everyday places and objects to be as connected and interactive as the screens we have today will drive consumer demand for a rapidly expanding internet of things.

Ericsson is the driving force behind the Networked Society – a world leader in communications technology and services. Our long-term relationships with every major telecom operator in the world allow people, businesses and societies to fulfill their potential and create a more sustainable future.

Our services, software and infrastructure – especially in mobility, broadband and the cloud – are enabling the telecom industry and other sectors to do better business, increase efficiency, improve the user experience and capture new opportunities.

With more than 110,000 professionals and customers in 180 countries, we combine global scale with technology and services leadership. We support networks that connect more than 2.5 billion subscribers. Forty percent of the world's mobile traffic is carried over Ericsson networks. And our investments in research and development ensure that our solutions – and our customers – stay in front.

Founded in 1876, Ericsson has its headquarters in Stockholm, Sweden. Net sales in 2013 were SEK 227.4 billion (USD 34.9 billion). Ericsson is listed on NASDAQ OMX stock exchange in Stockholm and the NASDAQ in New York.

Ericsson
SE-126 25 Stockholm, Sweden
Telephone +46 10 719 00 00
Fax +46 8 18 40 85
www.ericsson.com

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