Communication trends and the role of mail

Report for the International Post Corporation

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Abbreviations

B2B	Business to business
B2C	Business to costumer
B2X	Business to either other business or consumer
C2C	Consumer to Consumer
CIO	Chief Information Officer
CAGR	Compound Annual Growth Rate
CIFS	Copenhagen Institute for Futures Studies
DVD	Digital Video Disc
DVR	Digital Video Recorder
EU	European Union
FCC	Federal Communications Commission
GDP	Gross Domestic Product
GNI	Gross National Income
GPS	Global Positioning System
HD	High Definition
ICT	Information and communication technologies
IDA	The Danish Society of Engineers
IMF	International Monetary Fund
IPC	International Post Corporation
IPCC	Intergovernmental Panel on Climate Change
ITU	International Telecommunication Union
MIT	Massachusetts Institute of Technology
MMORPG	Massive Multiplayer Online Role Playing Game
MTV	Music Television
OECD	Organisation for Economic Co-operation and Development
OPA	Online Publishers Association
P2P	Peer to peer
PDA	Personal Digital Assistant
PoIP	Post-over-Internet-Protocol (PoIP)
QR code	Quick Response code
RFID	Radio Frequency Identification
UN	United Nations
USO	Universal Service Obligation
USPS	United States Postal Service
VoIP	Voice over Internet Protocol
VVoIP	Video and Voice over Internet Protocol

Executive summary

- The International Post Corporation has commissioned a study to present an analysis of communication trends and developments that are occurring outside the postal sector and that are creating new customer expectations, which could impact the role of letters mail as a communication device over the next ten years.

- The report is divided into seven sections. The first two present a brief history and the current state of information and communications technologies' (ICT) development. The third section presents megatrends and their impact on communication. This section is followed by a presentation of ICT development towards 2020. The fifth section analyzes the trends shaping customer expectations towards 2020. The sixth section presents future roles that letters mail could play as a communication device toward 2020, while the seventh section presents a baseline scenario for society in 2020.

- Letters mail in this report refers to correspondence and transactional mail as well as direct mail (addressed advertisements).

- The rapid penetration of increasingly faster and better quality broadband service as well as progressively more powerful mobile technologies is changing customer expectations towards communication. We have now become a mobile society that is 'always on.' We can come into contact with any one at almost any time.

- Over 90 percent of homes in the most ICT sophisticated countries have broadband access, and almost all residents above the age of 14 have a mobile phone. Over the next 10 years, mobile communication technology devices will be the most common interface device for accessing the Internet and online communication devices.

- Megatrends are broad societal trends that will impact every level of society and the development of ICT towards 2020. Megatrends structure our expectations assumptions regarding the future. This report analyzes 9 megatrends in detail.

    1. Economic growth – due to the economic downturn, the likelihood for a long period of economic stagnation is great among IPC member countries for much of the next decade.

    2. Globalization – Globalization is increasing the number of economies that are participating in technology development in communications. The number of new innovations, especially in social uses of mobile phones in developing countries, could influence mobile phone usage in more advanced countries.

    3. Environmental issues – Environment challenges – such as climate change – could represent a significant challenge for postal operators moving forward. Postal operators may be able to improve their environmental efficiency, but the debate over environmental footprints between letters mail and e-communication will remain. Postal services' customers may choose to use more e-substitution to lower their environmental footprint.

    4. Demographic trends – Demographic growth will be slow in most IPC countries, and the population will be ageing. The proportion of the population who are most proficient using ICT technologies (those born after 1977) will be approaching the majority of the population of most IPC member countries by 2020 and the majority of ICT users toward 2030. Their usage and preferences could represent a major substitution challenge for postal carriers.

5. Accelerating pace of change – Currently, the amount of information stored on the Internet doubles every two years; ICT devices are rendered obsolete every two to three years.[1] The pace of change appears to be accelerating as more and more elements of society, business, and government are exposed and contribute to technological innovation. E-substitution – especially as it concerns correspondence and transactional mail – could occur more rapidly than many postal operators anticipate.

6. Democratization of information (open source society) – Due to the democratization of information among other reasons, the cost of communication has plummeted. The quality requirements on postal services are heightened when the volume of free quality products increases. Why pay for something of possibly questionable quality when there are free or cheaper alternatives?

7. Commercialization – Postal services are becoming privatized and markets are being liberalized, paving the way for greater competition and hence more commercialization. Commercialization expands the range of products and services that will enter the market. National postal services will face increasing competition from delivery companies who compete for packages, increasing digitalization of letters and greater usage of electronic signatures and advertisements.

8. Increasing complexity – Society is becoming more polycentric and communication channels are proliferating, creating information overload for the majority of IPC member countries' citizens.

9. Individualization – Individualization will lead to the desire to receive individualized communications from companies. Some customers will want to receive letters mail. Others will want electronic communication, while some will want a combination of the two. Individuals will demand increasingly specialized services from postal carriers, such as the ability to have mail delivered at home, at work or somewhere else that better suits their lifestyle.

- Towards 2020, the quality and speed of broadband technologies will increase and range between at least 100Mbs – 1Gbs connections. Computing power will likewise double every two years for the next decade, permitting the creation of more powerful ICT applications.

- The future Internet will be a combination of the Semantic Web and Web 2.0, which will increasingly create the Internet of Things, where ICT is integrated into everyday items that communicate automatically with other objects, the Internet and us. It will also lead to the creation of 'augmented reality' where the online and offline worlds merge in new ways that will create new challenges and opportunities for postal operators.

- Towards 2020, correspondence and transactional mail will be increasingly threatened by digitalization, while direct mail will develop new roles, as ICT will allow for more personalized and powerful direct marketing campaigns. The explosion of communication devices will lead to the creation of more automatic filters, which may lead to the desire among advertisers to circumvent these filters and communicate directly with consumers themselves.

- More powerful ICT will permit the collection of better, more granular information regarding consumers' desires. Better ICT will lead to the creation of higher quality mass mailings as well as increasingly individualized and target direct mails, which though lower in volume will likely be of higher quality and impact. Better ICT will permit advertisers to create new direct mail advertisements that take advantage of augmented reality. Augmented reality advertisements use mobile phone and computer scanners and cameras to project 3-D images and videos of products and services that are focused towards the individual's needs.

[1] RAND, The Global Technology Revolution (2001).

Introduction

IPC members have requested a study

The International Post Corporation's (IPC) members have identified the need for a study to analyze communication trends and developments with a special focus on customer (sender and receiver) usage of mail services to assess future strategies for the postal service and future role of the Universal Service Obligation (USO). The goal of this report is to provide a comprehensive picture of the trends and developments in communications, ensuing consumer and business preferences and purchasing behavior, and predictions for the future role of mail.

Letters mail defined

Letters mail in this report refers to mail sent for correspondence and transactional purposes as well as direct mail sent for advertising purposes.

New consumer preferences and information and communication technologies are challenging established industries

New technology developments and changing customer preferences have been revolutionizing interpersonal communication for the past two decades. Over the past two decades, trends in electronic communications and the development of fax, email, VoIP, video conferencing, text messaging, social computing, and tweets have shaped and continue to shape customer, consumer and business behaviors towards physical means of communication (e.g., mail, books, newspaper, magazines, etc.), eroding physical communication's market share. The explosion of communication channels has been tremendous and is growing (see figures 1 and 2 for more details). Changing customer preferences, likewise, impact the types of communication methods that take hold in the marketplace. This reciprocal process will, in all likelihood, continue over the next 10 years.

Letters mail volumes are declining among IPC member countries

The arrival of new communication technologies and changing customer preferences may lead to an increasing substitution of letters with electronic alternatives. Global letter volumes are declining. Many postal firms are expecting mail volume declines of 5 percent in 2009, while the US Postal Service is reporting a 14 percent drop in volume. According to Menno Sanderse, an analyst at Morgan Stanley, European mail volumes could decline by as much as 50 percent over the next ten year.[2]

Shift from letters to electronic means could accelerate more quickly than anticipated

A number of factors, however, could merge to accelerate the decline in letters volumes over the coming decade. Such factors include, among others, demographic changes, economic savings, increasing technological sophistication of users, and the widespread diffusion of cheaper and more robust information and communication technologies (ICT).

Report's method and structure

The report takes an outside-in approach to analyze the changing communications environment and its impact on consumer behavior. The report is divided into seven sections. The first two sections present a brief history of ICT and the current state of ICT development. These sections are followed by a presentation of megatrends and their impact on communication. From the megatrend analysis, a description of future ICT and future communication customer expectations are presented. The following section presents the future role of mail followed by a baseline scenario for the future of society and how it communicates.

[2] "Dead letter," The Economist (31 October 2009), 71.

A brief history

We have witnessed a communications technology revolution

The growth of the Internet and other digital information and communications technologies has led to a revolution in commerce, information and communication. Twenty years ago the Internet was a resource for academics and the military. Entire universities were connected to the Internet with a data rate of 9.6 kbits/s. Mobile phones were for the select few. PDA's did not exist, nor did Tivo, DVRs, blogs, XBOXs, Wiis, digital cameras, or iPhones.

A 10-minute long distance phone call during office hours in Germany cost €3.25 in 1993. Wireless services did exist, but were even more expensive. In 1998, European telecom monopolies came to an end and prices fell to a fraction. The costs of calling between European countries and even the United States can now be achieved at low flat rates.

Since the introduction of the Internet, the size of the Internet has increased an average of 50-60 percent annually (a 100-fold increase per decade). In 2008, Internet traffic reached 6500 petabytes; for comparison purposes 1,000 petabytes is equivalent to 50,000 years' worth of DVD quality data.

Along with this phenomenal growth, the introduction of new technologies has expanded the communication channels available to consumers, businesses, and government (see figures 1 & 2). The explosion of options and low cost of data storage and zero cost of replication mean that there is no niche or market that is too small to find an audience or be served online.

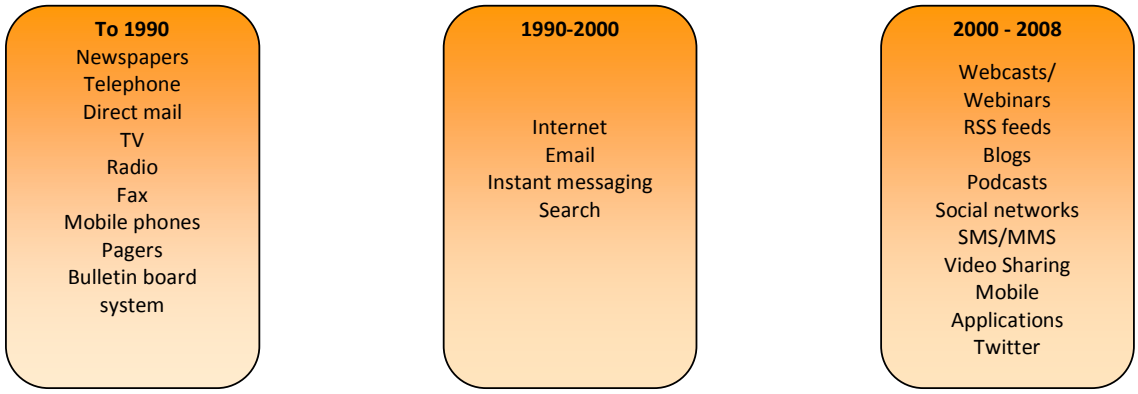


Figure 1 Communications channel proliferation

Figure 2 The art of the conversation – online channel proliferation

Communications environment today

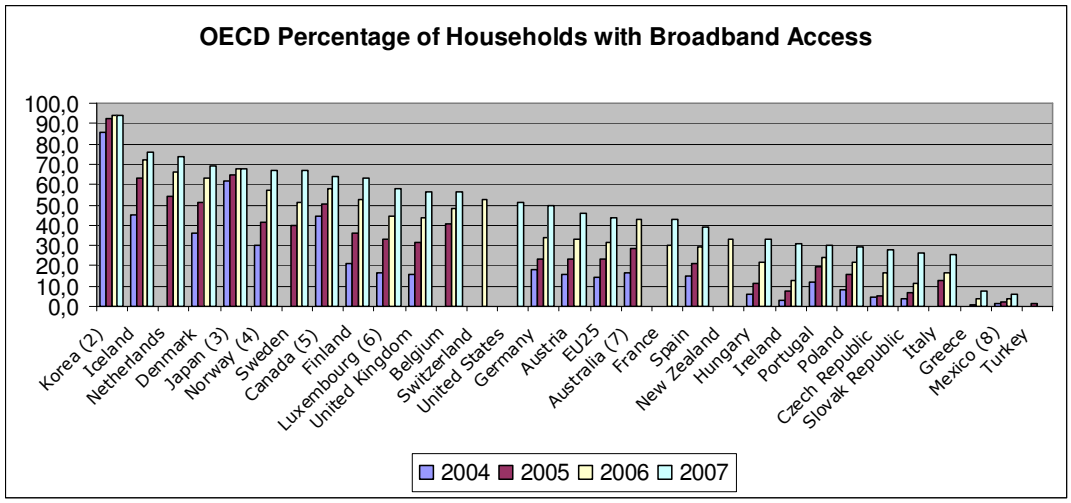
We are mobile and we can communicate with almost anyone at anytime due to broadband development. A tipping point reached?

We are mobile and can communicate with almost anyone at any time. Information and communications technologies (ICT) continue to spread throughout the world. More and more people have access to the Internet and its information and applications, and users are becoming increasingly skilled. Among OECD countries, broadband has or is rapidly becoming a general-purpose technology. Broadband represents a tipping point in ICT development, as it changes online consumer behavior and leads to new forms of communication among consumers and organizations. Fast, reliable, and high quality broadband access will allow an increasing number of activities to move online that once required letters mail. Access to the Internet via mobile cellular technologies continues to grow rapidly with IMT2000/3G networks and enabled devices, including data cards that allow users to access the Internet through cellular networks via their computers and mobile handsets.[3]

Majority of IPC members countries' citizens have broadband access

Among the world's most advanced ICT countries, over 90 percent of the population had home broadband Internet access as of 2007 (see figure 3). Other OECD countries are rapidly catching up. Businesses have broadband access. Over 90 percent of companies with ten or more employees in OECD countries have broadband access – except for Poland, Portugal and Mexico where over 80 percent do.[4] Over the coming decade, the quality and speed of the Internet connection will determine online usage.

Figure 3 Households with Broadband Access (OECD Broadband Portal, 2009)



Broadband access is an essential economic enabler

Broadband access is an essential economic enabler, as it is a general-purpose technology that fosters developments that are only available through high-speed Internet connections. Such applications include e-commerce, e-banking, e-government, person-to-person streaming, remote medical services, smart electrical grids, etc. Broadband is an essential element for creating increased economic efficiencies and increasing economic

[3] International Telecommunication Union, Measuring the Information Society: ICT Development Index, (2009).
[4] OECD, Broadband portal (2009)
<http://www.oecd.org/document/54/0,3343,en_2649_34225_38690102_1_1_1_1,00.html.>

enabler

productivity.[5]

Broadband users are different than dial-up users

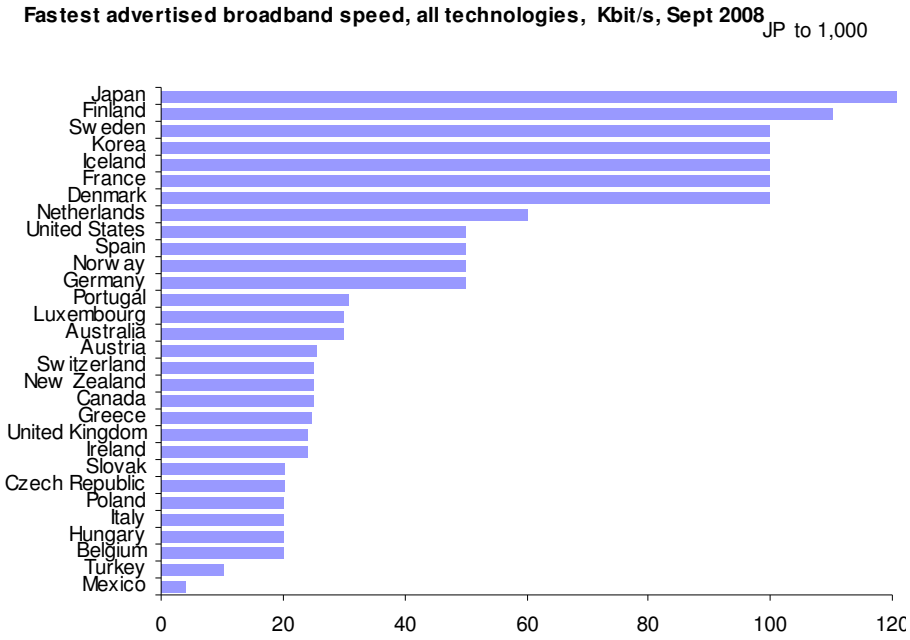
Broadband users are different than dial-up users. Broadband users are more likely to go online on any given day. They are more likely to spend more time online. Broadband users are more likely to participate in online activities than are dialup users. Broadband users are more than twice as likely to go online several times a day than are dialup users.[6]

Broadband access is leading to profound social shifts

Broadband also paves the way for profound behavioral shifts and social transformations. It allows users not only to consume, but also increasingly produce and share content on the Internet. Broadband access expands access to the online communities, identities, and fantasies that already exists among the tech-savvy to a rapidly expanding and highly differentiated public.[7]

Fastest connection available

Figure 4 Fastest advertised connection available among all surveyed operators, by country Sept. 2008 (OECD Broadband Portal)



Email is fundamental to modern workplaces

Communication is an inherent factor in white-collar work, which is the dominant activity in developed economies. According to a number of shadowing and diary studies, managers spend 50-85 percent of their day in interpersonal communication, while professionals spend 35-60 percent of their day doing so. Interpersonal meetings, email, telephone calls, and instant messages are the tools that present-day office workers use for communication. Email is a fundamental aspect of modern business and has expanded beyond its use as a simple communication device. Workers and managers use it to coordinate and monitor work progress, archive messages for later use, and flag issues of importance.[8] According to research conducted by the marketing firm, the Radicati Group, there are 1.3 billion email

[5] ITU, Measuring the Information Society: ICT Development Index (2009) and FCC - US Federal Communications Commission, National Broadband Plan - September Commission Meeting, (September 29, 2009).
[6] S. Craig Watkins, The Young and the Digital, Boston: Beacon Press, (2009), 8.
[7] Watkins (2009), 9.
[8] Laura Dabbish, et al. "Email Overload at Work: An analysis of factors associated with email strain" CSW ' 06 Procedings of the 2006 20th anniversary conference on Computer supported cooperative work, (November 2006).

users worldwide, about 1 for every 5 persons. These 1.3 billion users send approximately 183 billion email messages every day. [9]

Mobile platforms most common global communication platform

Residents of IPC member countries are already active mobile ICT users, and broadband enabled mobile phones are growing rapidly in popularity. There are 4.1 billion mobile phone subscribers globally, an increase from just under 500 million ten years ago. There are more mobile phone subscriptions in European countries than there are inhabitants. The total figure for developed countries is 100.3 subscriptions per 100 users. Regionally, there are over 70 subscriptions per 100 users in the Americas, 79 per 100 in Oceania and 38 per 100 users in Asia.[10]

Portable computers overtake desktop sales

Portable PC sales have overtaken sales of desktop PCs in the United States. The trends of international PC sales have also shifted in favor of portable computers. If current projections hold, portable PC's market share will increase from 52 percent of total PC sales in 2008 to 71 percent of PC sales by 2013 in the United States. The most explosive growth comes from portable mini-notebooks, whose portable market share has increased from 5 percent to 26 percent of portable PC sales. [11]

Mobile broadband is increasing

Mobile broadband use is also exploding. Subscriptions rates from 2004 to 2007 tripled, according to the International Telecommunications Union (ITU). Twenty percent of mobile subscribers in Europe have access to broadband services today. In the United States, mobile broadband subscribers currently constitute approximately 20 percent of the population.[12] This figure, however, is expected to increase to 40 percent, as smart phone sales are projected to overtake standard mobile phone sales by 2011 in the United States.[13] In developing countries, the figure is smaller, though likewise growing.[14] Figure 5 shows the evolution of mobile access among OECD member countries, including the growing market share attained by smart phones, which attained over 10 percent of market share in OECD countries in 2007.

[9] Dabbish, et al., CSCW'06 (November 2006).
[10] ITU, Measuring the Information Society: ICT Development Index (2009).
[11] "Mininotebooks Salvage PC Volume, but Take a Toll on Shipment Value, According to IDC" idc.com (16 September 2009).
<http://www.idc.com/getdoc.jsp;jsessionid=Z5JIEEVTWGEDCCQJAFDCFFAKBEAVAIWD?containerId=prUS22008509>
[12] Fitch ratings, Global Wireless Review - Statistics and Commentary, Fitch Ratings Ltd. (June 11, 2009).
[13] ITU, Measuring the Information Society: ICT Development Index (2009).
[14] Fitch Ratings, Global Wireless Review (June 11, 2009)

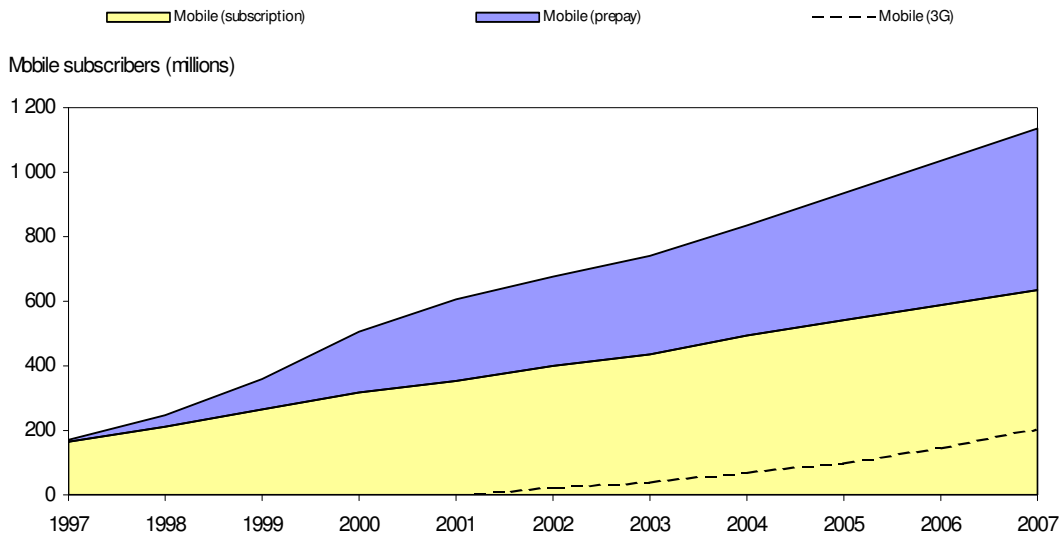


Figure 5 OECD Cellular subscribers in millions 2007 (OECD Broadband Portal, 2009)

Megatrends impact on communication towards 2020

Megatrends are driving forces for change

There are a number of broad societal trends called megatrends that will impact how future communication will develop. These trends and their consequences for future communication will be explored in this chapter. Megatrends help us structure our knowledge of the most likely changes in the future. Futurists argue that the future cannot be predicted. There are too many uncertainties, too much complexity. That, however, does not mean that we cannot say anything about the future. There are many trends that have shaped the world we see around us today and that we can assume with a great deal of certainty will continue to shape our future. We call these driving forces megatrends. Megatrends impact all levels and aspects of society for the next several decades.

9 megatrends with impact on communication

This report will focus on the 9 megatrends (in addition to technology development, which will be handled in the following section)[15] that will have the most impact on communication towards 2020. These megatrends will be used to create a baseline scenario of communication in 2020 and forecasts for the future role of mail. The megatrends are:

Megatrends with most impact on communication:

1. Economic growth
2. Globalization
3. Environmental issues
4. Demographic trends
5. Accelerating pace of change
6. Democratization of information (open source society)
7. Commercialization
8. Increasing complexity
9. Individualization

Source: Strategic Futures Studies. (CIFS, 2008).

Megatrends will be described one at a time though they are interconnected in reality

In the following sections, the megatrends will be briefly described one at a time. In reality, megatrends are interdependent. For instance, technological development will lead to economic growth, which in turn enables other trends like individualization and immaterialization. Individualization may promote creativity, which again promotes technological development. These connections are too complex to be described in this brief discussion of megatrends, but their interdependence will be addressed in the baseline scenario.

[15] The megatrends have been selected from 13 megatrends defined by CIFS in the report *Strategic Futures Studies*, (CIFS, 2008).

Economic growth

Economic growth will continue…

Economic growth is a fundamental element of capitalist society. Over the last 150 years, the global economy has grown on average at a rate of 2-3 percent annually. We can assume that the global economy will grow over the next 10 years despite the global economic downturn of 2008-2009.

Though at a lower rate in developed economies…

While the global economy will continue to grow towards 2020, the distribution of growth should shift towards Asia. Western economies face a number of structural challenges that will impact growth over the course of the next decade. The International Monetary Fund (IMF) projects that Western economies will grow at rates approaching 1 percent annually over the next five years. If we assume that economic growth returns to 2 percent on average for Western economies by 2015 – 2020, Western economies will only grow on average 1-1.5 percent annually towards 2020.

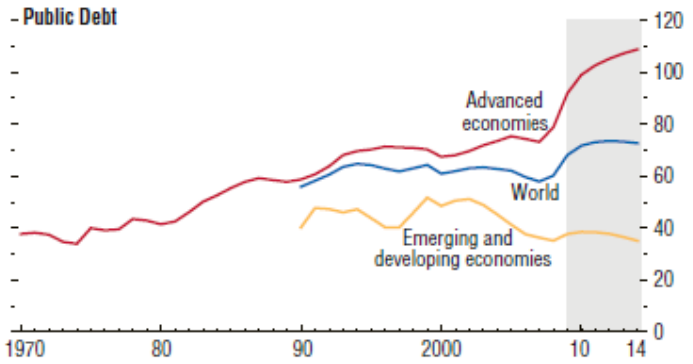
Due to low growth and structural unemployment

The impacts of the crisis will be felt for much of the decade due to unemployment, declining value of collateral, and increased debt burdens. This will lead to slower growth and structural unemployment, as workers skills erode. Businesses' focus has shifted to cutting costs, increasing efficiency and productivity to generate growth. Both business and consumer investments will be constrained over the next five years. The IMF forecasts unemployment rates in Europe to remain around 10 percent towards 2014, while unemployment could return to 5 percent as early as 2014 in the United States.[16]

Public debt sky rockets, governments scale back due to ageing populations

Public deficits have skyrocketed among advanced economies, approaching 110 percent of GDP on average according to IMF projections (see figure 6).[17] Japan's public debt will approach 200 percent by 2011. At the same time, demographic ageing will begin to take effect as populations in OECD economies approach retirement age. Governments will have to become more efficient and will be faced with making strategic decisions of cutting programs, raising taxes or a combination of the two.

Figure 6 Public Debt in advanced and emerging economies



ICT investments slow, though business and consumer

Due to the impact of the financial crisis, investments in new ICT platforms may be slowed (investment in wireless 3G and 4G networks, optical fiber networks, and Wimax, for example). ICT usage by governments, companies, and individuals, however, should accelerate as the need for cost cutting and productivity grows. Governments and businesses seeking to cut costs will increasingly require that communication with them

[16] IMF, World Economic Outlook 2009 (October, 2009).
[17] IMF (2009), 27.

usage accelerates

occur electronically, leading to further gains in e-governance, e-commerce, e-medicine, etc. over the next decade.[18] For example, in a cost benefit analysis of secured email and secured messaging versus letter and fax communications, shifting towards electronic communication would save between 700 and 800 Australian dollars per 100 reports sent and 100 reports received.[19]

ICT is relatively inexpensive, and increasingly FREE

Monthly ICT costs for consumers are already relatively low, corresponding to between 0-3 percent of Gross National Income per person among developed economies, according to the ITU.[20] The cost of access may decline further relative to income over the decade as a result of increasing competition between wireless and fixed-line providers and as companies compete to attract new customers, increase revenues, and build market share.[21]

Consequences for mail

An increased likelihood for a protracted period of economic stagnation will impact mail volumes moving forward. The growth of letters volume is strongly correlated with economic growth – despite the weakening of this correlation over the last decade. Falling ICT costs point toward a continued growth in active ICT users, particularly in countries where broadband penetration rates are lower than the OECD average (Southern and Eastern Europe, for example). In addition, depending on how long the effects of the economic downturn last, cost awareness will grow among government and business users for B2X (business to either other business or consumer) communication. This will impact correspondence and transactional mail by leading to e-substitution, increasing the drive towards using cheaper mail classes (second class mail for example), and leading to greater automation of postal services.

Globalization

Globalization

Globalization can be characterized as the growing global interconnectedness and flow of people, capital, products, services, information, technology, and culture due to the decreasing costs of transportation and communication.[22]

ICT and globalization

ICT is accelerating the globalization trend, and allowing for global networked social interactions and business supply chains. As broadband communication technologies expand to larger portions of the population, more and more people, organizations and governments are connecting and exchanging information in real time regardless of national boundaries. As the quality and speed of broadband services grow around the world, a proliferation of professional and user-developed content will flourish, increasing cultural inputs and challenging employees, governments and businesses around the world.

Consequence for letters market

Globalization and ICT increases the possibilities for individuals and companies to cheaply and easily connect and interact with one another at a distance. ICT are 'space transcending' innovations that allow us to communicate across space. Mail – one of the first space transcending technologies – will increasingly be complemented,

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[18] OECD, Government at a glance (2009).
<http://www.oecd.org/document/33/0,3343,en_2649_33735_43714657_1_1_1_1,00.html>
[19] South East Alliance of General Practice, "Cost benefit analysis of secure messaging – Communication Costs For Allied Health working in Aged Care", Australian Better Health Initiative (ABHI), Brisbane, (November 2008)
<http://www.seagp.org.au/content/Document/Cost20Benefit%20Analysis%20AHP%20working%20in%20RACF.pdf>
[20] ITU, Measuring the Information Society: ICT Development Index (2009), 56.
[21] ITU, Measuring the Information Society: ICT Development Index (2009), 6.
[22] Joseph E. Stiglitz, Globalization and Its Discontents, New York, Norton & Company, (2002), 9.

supplemented and superseded by the ultimate space transcending communication technologies – the Internet and the mobile phone.[23] Globalization also exposes societies to alternative uses for ICT. In the developing world, the lack of a well-developed infrastructure is leading to new uses for mobile phones, which do not exist in high-income societies, and which may provide some insight into what it is possible to use mobile phone technology for in the future. In developing countries, mobile phones are used increasingly as means for transferring payment and wiring money home or to loved ones, receiving remote medical diagnosis, and for entertainment and educational purposes.

Mail is more costly than electronic alternatives

Mail is more time consuming and more difficult to use than electronic alternatives (emails, text messages, blog posts, twitter and social network posts). In a study of young people's use of technology in the United States, S. Craig Watkins notes that young people are better able to maintain larger social networks than their parents were because communication has become increasingly easy. According to Watkins, "the geographical distance caused by moving away to school does not necessarily translate into social or emotional distance. Out of sight does not mean out of mind in the digital age."[24]

Environmental issues

Environmental challenges will force us to improve the environmental efficiencies of our economies

The impacts that human activity has on the environment – particularly climate change due to the release of greenhouse gases – will be a major driver shaping all aspects of society over the next several decades. Globally, we have to become more environmentally efficient in energy and materials usage. According to a 2008 McKinsey Study, we have to increase the productivity of our economy measured in CO_2 equivalents from $1 of GDP produced per kilogram of CO_2 in 2008 to $30 of GDP per kg of CO_2 by 2050 to meet the 450 ppm goal recommended by the UN IPCC. Global CO_2 productivity increases will have to be three times faster than labor productivity increases achieved during the industrial revolution![25]

Physical transportation of goods and services will be impacted

To achieve these goals, societies around the world will be forced to restructure their economies, infrastructure, diets, and travel and work habits. For example, the Danish Engineer's Association is recommending that total physical traffic on roads be reduced by 18 percent in Denmark by 2030. This proposed reduction takes into account that 45 percent of all road vehicles have already been electrified by this time. Physical traffic will have to be replaced by digital alternatives and developments of new living and working areas.[26]

As far as it is understood today, a letter generates between 25g and 50g of CO_2

Pitney Bowes' 2008 baseline study on the environmental impact of letters mail found that the average letter in the United States generates 20-50g of CO_2 to produce, deliver, and dispose. This study also notes that, as ICT are often used to generate much of the content in letters mail at some point, the absolute gains from moving away from physical to virtual communication may not be as great as some anticipate.[27] Their study was, however, hampered by a lack of "centralized and standardized set of data for the life-cycle activities and processes to be included in estimating letters mail's environmental

[23] Watkins (2009), 52.
[24] Watkins (2009), 71.
[25] McKinsey Global Institute, The Carbon productivity challenge, (2008).
[26] IDA, The IDA Climate Plan 2050, (2009), 125.
[27] Bowes, (2008).

impact."[28]

Comparisons between email and mail are impossible though ICT's impact is significant

When Pitney Bowes attempted to compare the impacts of mail versus email, they noted that the comparison is impossible to make, as ICT's environmental impact is not well understood. ICT can be used to communicate in a variety of ways. People can stream video and voice conversations, send instant messages and emails, and post messages on Twitter and Facebook. The study notes that the environmental impacts of ICT in terms of energy use, however, are great. ICT contributes to 2 percent of the US national energy use, which is similar to the paper industry, to power the country's 11 million servers and 248 million PCs. The study also noted that ICT users are likely to print more than 1,5 times as many documents (messages, websites, documents, emails and attachments) as they receive via physical mail.[29]

ICT is, however, seen as important for environmental efficiency

Transactional and direct mail, however, are single-use communication devices, while other ICT are essential enablers for a smarter, greener economy and society. Computer power consumption must be weighted against the energy efficiency gains that ICT enables all sectors of the economy to produce. Today, almost all office and home appliances have embedded microchips and software to improve their effectiveness and energy-efficiency. Broadband technology will enable the development of smart electrical grids that will help homes, offices, and industries make better use of energy in the future. The same infrastructure that connects the user to Internet will connect her smart home with the electrical grid. The introduction of 'telepresence' (3D high-definition meetings between offices and homes) will allow people to replace physical travel to work and meetings with virtual commuting.[30] The European Union,[31] the United States,[32] Japan, South Korea, etc. all recognize the enabling role that ICT will play in creating a greener economy.

Consequences postal services

The environmental challenges will become more important moving forward as more industries join the 'green wave'. Even if it is difficult to compare the environmental impacts of e-communication and letters mail, postal service operators may increasingly be locked into an eco-innovation competition with the ICT industry. From 1995 to today, the most environmentally friendly PCs have reduced their energy footprint by 87 percent from 30W to 4W while active, and by 75 percent while asleep.[33] The trend towards 'cloud computing,' which will be discussed in greater detail in the next chapter, permits the centralization of computational and energy intensive services. Due to the nature of the Internet, the servers that service the 'cloud' could be centralized on CO_2-neutral electrical grids, substantially reducing ICT footprints over the coming decade.

The climate debate increasingly focuses on how we use our natural resources. This can have a major impact on how customers perceive B2X communication in physical formats (transactional and direct mailings). Over the next ten years, postal operators will

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[28] Pitney Bowes, The Environmental Impact of Mail: A Baseline (2008).
<http://www.pb.com/bv70/en_US/extranet/landingpages/Environ_Impact_Mail_Web.pdf>
[29] Bowes, (2008).
[30] Peter Johnston, Economic Recovery to a greener economy: mobilizing ICT-based innovations Policy brief, European Policy Centre (July 2009).
[31] Europe's information Society, "Commission casts ICT in green role - We need a high growth, low carbon economy", Newsroom, (May 13, 2008).
<http://ec.europa.eu/information_society/newsroom/cf/itemdetail.cfm?item_id=4101>
[32] FCC, (2009).
[33] Plan mijlø, Innovative Green Public Procurement in Nordic, The Integrated Product Policy Group of the Nordic Council of Ministers. (18 June 2009), 29-30.

have to increase their energy efficiency. They will have to increasingly measure, monitor and communicate their environmental footprint to their customers. Better measurements will be created which will allow businesses and customers to better understand the environmental costs of their communication choices. Postal services need to be prepared for these developments.

Demographic trends

OECD populations are ageing, urbanizing

The populations of developed countries are ageing, urbanizing and growing increasingly technologically sophisticated. The median age of OECD populations will approach 43.8 years of age by 2020. By 2020, 74.8 percent of the European population will live in urban areas up from 71.9 percent today.[34] Today's young people are society's most proficient when it comes to using communication technologies. As those who are currently under 32 years of age (those who are growing up or have grown up in a digital age)[35] become the majority of the population 2020 – 2030 due to natural demographic change, we will witness a broad and fundamental shift in communication behaviors unlike any we have witnessed before.

Becoming more technologically sophisticated

Populations are becoming increasingly technologically sophisticated. Although young people, those born after 1977, are the most technologically savvy demographic group, all age groups are more technologically sophisticated than they were five years ago. According to the ITU, Internet access and usage is growing rapidly around the world. Every region has shown marked improvements in its population's ICT usage and sophistication.[36] According to Pew Internet and the American Life Project study on generational differences in Internet usage, all generations have increased their Internet usage since 2005.

Demographic developments will lead to a majority of indigenous users by 2030

People born before 1977 are generally considered migrants to ICT.[37] They grew up before the rapid proliferation of ICT made computers and mobile phones commonplace during the late 1980s and 1990s. Those who were born afterwards have grown up surrounded by ICT. They were more likely to have PCs, access to the Internet and mobile phones from an early age. They are the most comfortable with ICT. While older users use ICT to make purchases, conduct research and send emails, young users are the most likely to use ICT as the principal means for socialization. They are the most likely to have set up and actively used social networking sites, chatted via instant messaging services, played online video games, etc.[38]

Those who have grown up 'digital' will become the ICT users majority close to 2030

By 2020, the majority of residents in advanced economies will have been born after 1977. Although they will be the majority of residents, they will not be the majority of ICT users, which typically occurs with a 10 to14-year delay. Although 70 percent of American 4-6 year olds have used a computer, it is not until 13-14 years of age that the overwhelming majority of early teens become active, independent ICT users, increasing from 60 to 82 percent in just one year. By the age of 17, 92 percent of teens are active users.[39] As a result, the proportion of the population that is born after 1977 will not constitute the majority of ITC users until closer to 2030.[40]

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[34] OECD and UN Population statistics 2009.
[35] Don Tapscott, Growing up digital (1997).
[36] ITU, Measuring the Information Society: the ICT development index (2009).
[37] Don Tapscott, Growing up digital (1997).
[38] Pew Internet and the American Life Project, Generations Online in 2009 (January 2009)
[39] Watkins, (2009), 5.
[40] UN Population statistics 2009.

Consequences for mail

The demographic change represents the most fundamental challenge to the future of letters mail moving forward, especially in economies where broadband Internet penetration rates are strong – North America, Japan, South Korea, and Northern Europe, including the Baltic countries. We have a generational shift occurring among OECD societies. Older generations, which are more attuned to classical media (books, newspapers, television, letters), will grow progressively smaller over time. This generation will be replaced by a generation for whom ICT forms the backbone of the way they communicate and interact with the world around them. As the sociologist Robert Putnam notes, "If different generations have different tastes or habits, the social physiology of birth and death will eventually transform society, *even if no individual ever changes*."[41]

Those born after 1977 use the Internet and the mobile phone as their primary communication and socializing devices. The Internet and the mobile phone are integral for shaping their identities, and are the top two necessities in a young persons life, having replaced the television.[42] The impacts of this transition are fundamental and will affect all aspects of society, business, and politics. Six out of ten young people get the majority of their news online. President Obama was the first presidential candidate in the United States to successfully use ICT to solicit donations, as well as actively engage voters in his campaign. The majority of his online supporters now expect that his administration will continue to communicate with them via email, text messages, or social network sites.[43]

Accelerating pace of change

Society, business, and government are more exposed to technological innovation

The accelerating pace of change is a phenomenon that has been discussed for several decades and is often associated with Moore's law. Economic growth fuels research and development investments, which leads to increasing innovation. The expansion of capitalism to South Asia, East Asia, South America and Eastern Europe is expanding the areas of innovation and competition from Europe and North America. As a result, the number of product and service innovations and new approaches will increase. Currently, the amount of information stored on the Internet doubles every two years; ICT devices are rendered obsolete every two to three years.[44] The pace of change appears to be accelerating as more and more elements of society, business, and government are exposed and contribute to technological innovation. For example, it took telephones 71 years to penetrate 50 percent of American homes. Electricity took 52 years, television three decades. The Internet only needed a decade to reach more than 50 percent of Americans. DVD took only 7 years. Facebook took just five years to reach 200 million users.[45] The cultural change that ICT is creating will reinforce the pace of technological development, as networks and markets become increasingly ICT proficient. According to researchers at the RAND corporation in the United States, increasingly fast and high quality broadband connections among organizations, families, products, services, etc., will lead to more rapid digitalization of information than previously experienced.

Consequences for mail

The accelerating pace of change could mean that the transition away from letters mail could occur more rapidly than previously anticipated among mature postal markets.

[41] Watkins (2009), 207.
[42] Watkins (2009), 14-15.
[43] Watkins (2009), 204.
[44] RAND, The Global Technology Revolution (2001).
[45] Ken Auletta, Googled (2009), 15.

There are a number of factors that are currently converging that could lead to a more rapid decline in letters mail volumes, especially among B2X correspondence and transactional mail: Naturally occurring demographic transitions are leading to a majority of the population for whom the Internet and the mobile phone are their primary means for interacting with the world around them. Older populations are becoming increasingly technologically sophisticated. Governments and businesses need to reduce costs and therefore seek cheaper alternatives. Due to technological developments, ICT are becoming more powerful and can replace more and more traditional media.

Democratization of information

The Web threatens established authorities

Specialized information used to be the sole domain of a small elite of academics, specialists and professionals. This is no longer the case. Due to development of the Internet and especially the explosion of Web 2.0 sites (the Social Web), information consumption and production have become democratic. It is easier to obtain information about your neighbor, boss, or candidate for a job.[46] We are also witnessing a pronounced flourishing of free content and services on the Internet. This free content is created and distributed by the users themselves in voluntary networks according to rather anarchic principles: Wikipedia, open source software, books, music, films, and design, which the creators make freely available, are all examples of this phenomenon. All of this challenges and supplements traditional commercial companies by offering non-commercial alternatives. CIFS has termed this phenomenon 'anarconomy.'

Wikipedia is perhaps the best current example of the anarchic philosophy on the Internet. Wikipedia is an encyclopedia, but it is not written by professional encyclopedists or edited by a central editorial staff. Anybody can freely write articles, and anybody can freely edit others' articles, as long as you follow the guidelines for presenting articles. There is no economic reward for contributing, but in return, it does not cost anything to use the encyclopedia.[47]

Digital content for free?

Once information becomes digitized, its value drops. Once a piece of knowledge – or a knowledge product in a broader sense – has been digitized, it costs practically nothing to make and distribute more copies of it, just a bit of bandwidth and disk space. This is true for information, software and entertainment. Traditionally, we have become used to paying money for that, because the expenses in developing the products must be covered through sales. However, if the development of knowledge products can happen through sponsorship or voluntary, unpaid labor, there is no reason they should cost anything – and they do not if they are released as open source or open content.

Consequences for letters mail

Due to the democratization of information and the anarconomy trend, the cost of communication has plummeted. ICT products and services have *inclusive* value – the more that have them, the more they are worth. A social network is worth more, the more that are part of it. A word processor is worth more; the more other people have it (or something compatible with it). This means that it is in the interest of all owners to get more owners – and you do that best by giving it away.

An explosion of free communication

VoIP services, sponsored email services (Gmail, Yahoo, Hotmail), social networking sites, blogs, wikis, Vlogs and podcasts can be utilized for effective and instantaneous communication with one person or a group of persons at little or no cost. The cost to the

[46] Ester Dyson, "How Loss of Privacy May Mean Loss of Security, Scientific American, (September 2008), <http://www.scientificamerican.com/article.cfm?id=how-loss-of-privacy-may-mean-loss-of-security>
[47] CIFS, Anarconomy (2009).

options

user is a computer or mobile device (which is already sunk), electricity and an Internet connection.

A fundamental challenge to postal services, though customers win

The quality requirements on postal services are heightened when the volume of free, quality products increases. Why pay for something of possibly questionable quality when there are free or cheaper alternatives? Free products keep commercial producers and service providers on their toes – they constantly need to be one step ahead. In return, free alternatives cannot afford to lag too far behind commercial products, because then they cease to be real alternatives. This mutual challenge is a great advantage for the users, who increasingly are given a choice between solid free products and commercial products that – perhaps – are a little bit better or sharper.

Commercialization

Commercialization will change postal services, business models

Commercialization occurs when more and more areas in society are made subject to commercial business. This includes the liberalization of many entrenched public services. When public services are seen as insufficient or ineffective, many become willing to pay for commercial alternatives. Postal services are becoming privatized and markets are being liberalized, paving the way for greater competition and hence more commercialization. Commercialization expands the range of products and services that will enter the market. National postal services will face increasing competition from delivery companies who compete for packages, increasing digitalization of letters and greater usage of electronic signatures and advertisements. The creation of hybrid postal solutions services could lead to the introduction of localized postal services that steal market shares in the most profitable urban markets. There are virtually no limits on what it is possible to sell on today's market, and in the future; even the most unlikely products and services are sellable on the market. The liberalization of postal services will lead to greater consolidation, a restructuring of logistic chains and the introduction of a number of new business models.

Increased complexity

A polycentric society

We are living in an increasingly polycentric society due to globalization, proliferation of information and the accelerating pace of change.[48] This affects the way customers behave. They need to improve their coping mechanisms, whether technical – automatic filters such as anti-spam services – or social – the creation of new social etiquette – to deal with the increasing complexity in the world.[49]

Globalization and ICT led to an explosion of complexity

In the natural sciences, involved agents' reactions are, if not predictable, measurable and often describable. Social constructions and interactions are often unpredictable. Globalization and ICT revolution have dramatically increased the level of human interactions, increasing society's complexity and limited our ability to understand global social, economic and political interactions. [50] The number of websites on the Internet has grown five-fold since 2002 to over 25 billion websites in early 2009. The volume of communication is likewise exploding. Active ICT users are forced to deal with a constant bombardment of emails, text messages, online and offline advertisements, phone calls, mails, etc.

How does the

Users cope with this overflow of information by self-selecting their communicative

[48] Lars Qvortrup, Det vidende samfund, (2004) 57ff.
[49] Niclas Luhman, Sociale systemer, Hans Reitzels forlag, (2000).
[50] W. Brian, Complexity and the economy, in Science 2, vol. 284, (1999), 107-109.

user handle complexity?

behavior. They seek their news from their favorite website, blog, television show or newspaper, filtering out the rest. They rely increasingly on technology to filter out information. Spam filters block unwanted emails; DVRs record television and online programs, where users can then skip undesired messages.[51]

Consequences for postal services

Towards 2020, ICT will increasingly generate and filter automatic messages to help people cope with information overload. Physical advertisements and mail may be one of the few ways that people and companies can circumvent digital filters and communicate directly with the individual about new products and services in their area.

Individualization

The individual identity is now driven more by personal choices

Individualization is the ongoing liberation of the individual from natural and cultural bonds and limitations, made possible by the modernization of society. People are no longer forced, and rarely expected, to choose the same career, religion and political viewpoint as their parents. The individual identity is now more a result of personal choices than of outside influences.

Communities still matter but independence is getting more important

Increasing individualization is a result of greater personal need for individual expression combined with improved means for individual freedom. People in high-income societies have reached the top of Maslow's Hierarchy of Needs and increasingly value self-actualization over belongingness. This is not to say that individuals do not want to belong to a community, but rather that they make their own choices of what community or communities they wish to belong to. Increasing economic independence also favors independence of thought, style, and culture. In the past, going your own way carried the risk of ostracism; today it is becoming increasingly important to 'brand' yourself as an independent individual.

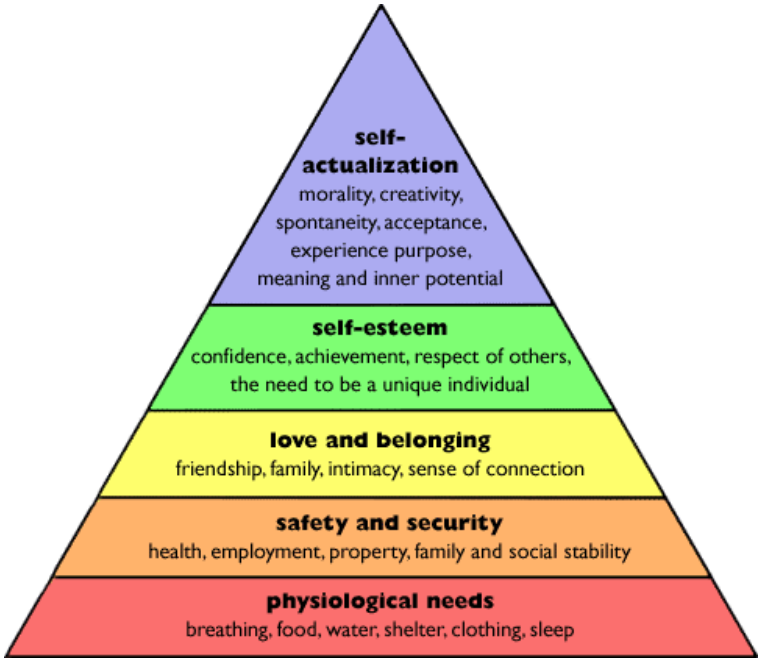


Figure 7 Maslow's Hierarchy of needs

[51] See for example Lucy Suchman, Human-Machine Reconfigurations, Cambridge University Press, New York, (2007).

Individualization is forcing people to choose

While individualization in general has provided greater freedom, it has led to a 'tyranny of choice'. Today, you have to choose what you want to be, do, mean, and look like, and what people, cultures and ideas you want to associate with and be associated with. If you do not make these choices, you become a non-entity without a meaningful social network.

The impact on modern societies

There is an increasing demand for individualized products and services, often with the customer as co-designer. Customers and employees are less likely to adopt a company's brand and culture as their own and will focus more on using the company as an element in branding themselves. Individualization erodes collective institutions like trade unions, political parties, organized religion, the nuclear family, and the local community in favor of informal, personal networks. The individual's respect for and dependence on authorities declines. She is more reliant on herself and on personal networks.

Consequences for postal services

Increasing individualization leads to the creation of more households in a given society, as young people move away from home at a younger age and married couples divorce. This has a positive impact on postal volume growth. Individualization will lead to the desire to receive individualized communications from companies. Some customers will want to receive letters mail. Others will want electronic communication, while some will want a combination of the two. Individuals will demand increasingly specialized services from postal carriers. Individuals may want to receive their mail at their work, at home, or on their way to work. They will expect that their postal carrier offer them greater flexibility of services.

Future communications technologies – market push

Mixed and augmented reality become the norm

The revolution in communication technologies that we have experienced since the introduction of the personal computer in the early 1980s will continue over the next decade. Global ICT will continue to transform the way we communicate, as the 'social' and 'collaborative' technologies increasingly drive web development. Future communications technologies will increasingly bridge the gaps between the physical and digital worlds, creating a mixed and augmented reality that offers new communication opportunities for consumers, governments, and businesses. The development will occur through the following factors:

The future of ICT is mobile and personal

1. ICT will become increasingly powerful, ubiquitous and mobile, merging into everyday items, clothing, furniture, vehicles, etc. **Mobile devices will be the primary means for accessing the Internet and communicating towards 2020.**[52]
2. The development of quality, high-speed broadband technology will be an essential element, enabling the interaction of new technologies and forms of communication.
3. These pervasive and ubiquitous computers will do less 'computing', as these tasks will be increasingly sourced to the 'cloud' of services (geo-location, email, social networking services, online games, as well as online word processing, spreadsheets, etc.) that are centralized on the Internet and accessible through browsers on computers, mobile phones, etc.

Semantic Web and the Internet of Things

These factors will create a seamless fabric of connectivity and lead to the development of the 'Internet of Things'[53] and potentially the Semantic Web. The user will be able to use these technologies to communicate with each other and interact with technologies in radically new ways.

Moore's law still holds towards 2020

Over the last several decades the development of ICT has followed several observable trends that industry experts have termed 'laws,' such as Moore's, Nielsen's, and Kryder's. Industry experts expect that these observable laws will continue to hold over the next decade.[54]

In 1965, Intel co-founder Gordon Moore observed that the density of transistors on a chip doubles every 18 months (this is known as *Moore's Law*). In 1975, Moore revised this to 24 months, and transistor counts have in fact doubled about every 24 months over the last decades. The term Moore's Law is now often used in a more general sense as the observation that computer capacity doubles about every 18 months. The overall trend is a doubling about every 18 months of the computer speed you can buy for $1000.[55]

Jakob Nielsen from the Technical University of Denmark has made a similar observation regarding Internet connection bandwidth. His observation (often referred to as *Nielsen's Law*) is that bandwidth increases 50 percent each year, or

[52] Pew Internet and the American Life Project (December 2008) *The Future of the Internet III.*
[53] Maarten Botterman, Internet of Things: an early reality of the Future Internet (May 10, 2009).
[54] Rand corporation (2006) Global Technology Trends 2020, 4.
[55] Hans Moravec, Carnegie Mellon University, 2002.

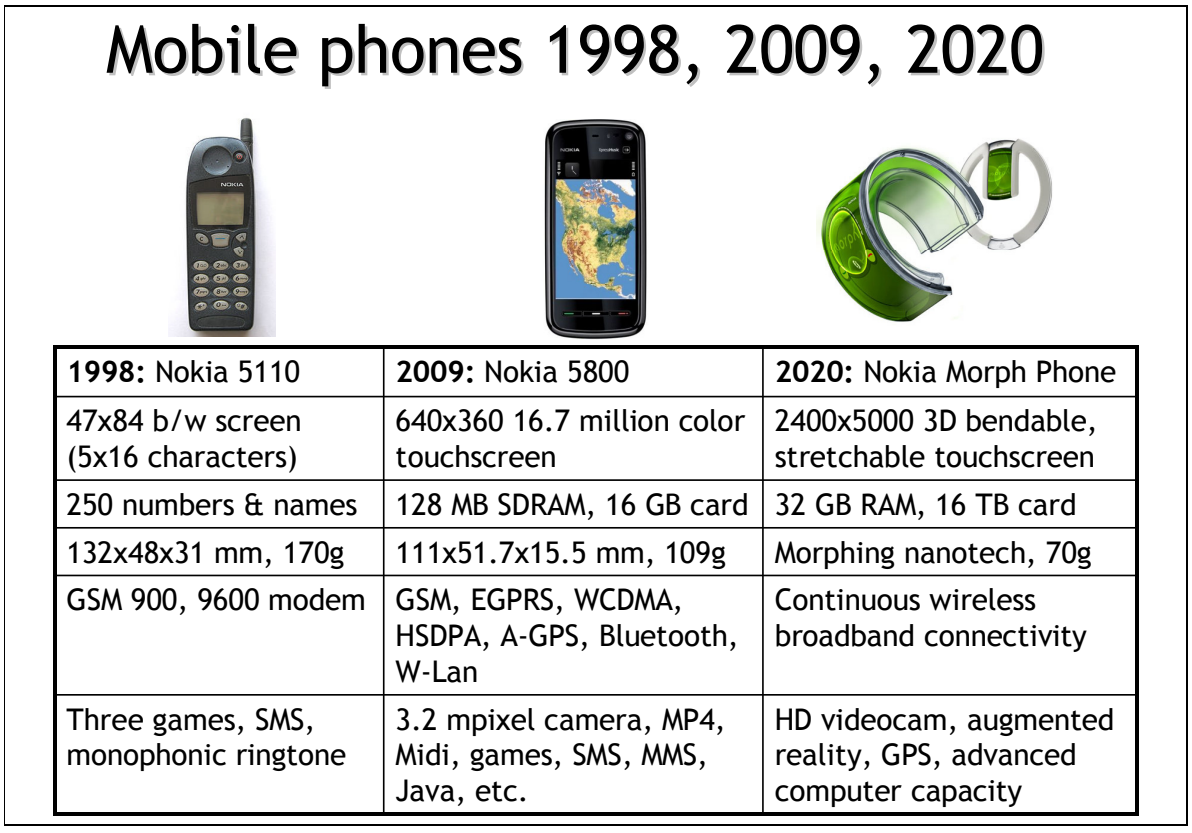
doubles every 21 months.[56] Yet another law is *Kryder's Law*, named after Mark Kryder, former Senior Vice president of Seagate Corp. This observes that the density of data on computer hard disks doubles every 12 months.[57] We can assume that a similar law also holds for portable storage media like memory sticks.

ICT devices increasingly powerful…

Combining these 'laws' together, we get roughly the following improvements over a 10-year period:

- 30 x transistor count on chips
- 100 x computer speed at the same price
- 50 x Internet connection bandwidth
- 1000 x hard disk space

These trends will also apply to mobile phone technology, which will become increasingly powerful and robust over the next ten years. Cisco anticipates that mobile broadband handsets will account for over 80 percent of mobile data traffic by 2013.[58] (See figure 8 for an projection of the evolution of mobile phone technology towards 2020.)



1998: Nokia 5110	**2009:** Nokia 5800	**2020:** Nokia Morph Phone
47x84 b/w screen (5x16 characters)	640x360 16.7 million color touchscreen	2400x5000 3D bendable, stretchable touchscreen
250 numbers & names	128 MB SDRAM, 16 GB card	32 GB RAM, 16 TB card
132x48x31 mm, 170g	111x51.7x15.5 mm, 109g	Morphing nanotech, 70g
GSM 900, 9600 modem	GSM, EGPRS, WCDMA, HSDPA, A-GPS, Bluetooth, W-Lan	Continuous wireless broadband connectivity
Three games, SMS, monophonic ringtone	3.2 mpixel camera, MP4, Midi, games, SMS, MMS, Java, etc.	HD videocam, augmented reality, GPS, advanced computer capacity

Figure 8 Mobile phone evolution 1998 – 2020

[56] "Why you should have a Web Site: It's the Law! (and other Web 3.0 issues)" World Wide Web Consortium <www.w3.org/2009/Talks/01-15-steven-website/bandwidth.png>
[57] Øivind Kolloen, "Lagringsmedier og lagringsteknologi" <www.ansatt.hig.no/okolloen/lagring/Hard_drive_capacity_over_time.png>
[58] FCC, Broadband study, 70.

Broadband capacity expands, enabling new communication

As was noted in the previous section, broadband is a key, general-purpose technology that is an essential component of future ICT development and a key determinant for how we will communicate in the future. It is therefore a key issue to monitor over the next decade. Broadband development consists of two factors: speed and quality of access. Over the coming decade, we can expect download speeds of at least 100Mbs and approaching 1Gbs for all homes and businesses.[59] The development of broadband technology requires intensive capital investments. One can therefore expect differences in its development as local factors and national regulations accelerate or delay broadband development.[60]

The wide distribution of high-speed broadband will enable new forms of communication. It will enable the Internet of Things (i.e. smart homes and electrical grids). It will enable virtual learning and the creation of 3D HD TV and movies at home, of the sort that became available in a variety of movie theatres in 2009. It will enable the creation of true 'telepresence' such as HD videoconferencing and the creation of the virtual office. Please see the table in the appendix for bandwidth rates required for various ICT applications.

Access to the Internet a universal Human Right?

As the Internet becomes increasingly integrated into our daily lives, a debate has arisen that will continue for the next several years regarding whether access to the Internet is a right or a privilege that can be taken a way for violating copyright laws, for example. In May 2009, the French Constitutional Court – the country's highest court – has ruled that access to the Internet is a fundamental human right that cannot be taken away regardless of whether the user has violated copyright protections by illegally copying protected content.[61] In October 2009, the Finnish government guaranteed broadband access of 1Mbs to all its citizens by 2010 and 100 Mbs access by 2015.[62]

ICT will become increasingly mobile, pervasive and ubiquitous

The mobile phone is the most pervasive communication device on the planet with over 4 billion users today, and portable computers already outsell desktop computers. The number of Internet enabled mobile devices is exploding; they include PDAs, mobile smart phones, GPS trackers, industrial equipment, etc. By 2020, it is not entirely unrealistic to imagine that almost all adults and children over the age of 6 have access to some sort of mobile Internet enabled communication device. Increasingly compact and more powerful processing power will lead to a radical change in the way we interact with technology. Increasingly small bio and nano sensors and computers will merge computer processors into our surroundings and become embedded into our walls, floors, furnishings, clothing, vehicles and bodies, creating a mixed and augmented reality as well as the 'Internet of Things'. The Internet of Things combines RFID, Internet and communication technology in new ways.[63] These sensors and computers will automatically monitor our environment and communicate with each other, with the 'cloud', and with us.[64]

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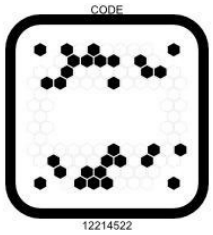
[59] Robert C. Atkinson, Market structure for ultrabroadband: Should we expect multiple, competitive UBB access infrastructures or regulated monopoly UBB utility? (or something else?) CITI (April 18, 2008).
[60] Martin Sauter, Beyond 3G – Bringing Networks, Terminals and Web Together (2009), 1.
[61] Ian Sparks, "Internet is fundamental human right, rules French court" Daily Mail (June 12, 2009) <http://www.dailymail.co.uk/news/worldnews/article-1192359/Internet-access-fundamental-human-right-rules-French-court.html?ITO=1490.>
[62] Aaron Saenz, "Finland Guarantees Right to Broadband Access by 2010" Singularity Hub (October 15, 2009) <http://singularityhub.com/2009/10/15/finland-guarantees-right-to-broadband-Internet-access/>
[63] Maarten Botterman, Internet of Things: an early reality of the Future Internet (May 10, 2009).

Augmented reality and the Internet of Things already exist in their infancy today. Augmented reality merges the offline world with the online through a variety of technologies. For example, smart phones allow users to navigate urban environments by using GPS and the phone's built-in camera to identify the location of nearby subway entrances. At the same time, smart phones provide geographically relevant information, such as whether your friends are nearby, and provide links to local real estate, advertisements, restaurant reviews, and geo-tagged Twitter and blog posts.[65] Quick response codes (QR codes, the Bee tag, for example) link the offline world with the online world and allow users to delve deeper into subjects they are interested in.[66] Books, commercials and magazines equipped with QR readers allow users to delve into much greater detail about a topic they are interested in or to bring images or stories to life on their computer.[67]

To see examples of how the Internet of Things will impact our daily and business lives, visit the SENSEI project: http://www.ict-sensei.org/Sensei_090422/ or take a snapshot of the QR code to visit the SENSEI project's Internet of Things scenarios through your smart phone (you will have to download a QR code reader at http://www.beetagg.com/ first).



Over the coming decade, information from bio and nano sensors, mobile phones, and computers will be increasingly collected and processed through the Internet and less often by the device itself in what is known as 'cloud computing.'

Cloud computing has come into its own and will shape ICT over the coming decade

The 'cloud' is a metaphor for the Internet, and cloud computing in its simplest form is the delivery of computer services from shared infrastructures of pooled systems. The cloud is made up of several data centers spread across several locations. Cloud computing enables companies and individuals to cut costs on hardware, software, and services by handing over the operation of their email, customer databases, accounting software, etc. to someone else, and then access and pay for what they actually use.

Cloud computing is driven by the rapid expansion of data, content, capacity, commerce and price declines. The doubling of traffic every two years creates interest among companies for continually increasing scale of data manipulation (i.e. computing power) along with the desire to cut rising costs from content creation, storage and processing. These factors are driving cloud computing's value proposition and development. 'Cloud computing' environments will gain more importance with the rapid growth in connected devices, real-time data streaming and Web 2.0 applications, such as enterprise and personal mashups, open collaboration environments, social networking sites and mobile commerce.[68]

The Semantic Web v. the User-driven

There are different opinions concerning how the Internet will be structured and what will drive its development towards 2020: will the Internet be self-regulated,

[64] Rand Research, Beyond the Internet (2004) <http://www.rand.org/scitech/stpi/ourfuture/Internet/index.html>
[65] MIT Technology Review (December 2009), 20-21.
[66] "About Bee Tagg" <http://www.beetagg.com/>
[67] MIT Technology Review (December 2009), 20-21.
[68] Thomas E. Ferleman, "Technology Forecast: Four Mega-Trends Creating Significant Disruptions Across the Technology Landscape", 2009.

Web, or a combination of the two?

will it be structured by all-encompassing semantic codes that organize available information, or will it be a combination of the two?

The Internet as we know it now will evolve. According to Tim Berners-Lee, the Semantic Web[69] will become a universal system of organizing information on the Internet, which would make it possible for the Web to structure data itself. This would make it easier to meet the demands of users to find the requested web content or a specific product, and the mapping of consumer behavior of the Internet will become the guiding principle for business communication and marketing measures.[70]

A competing notion is that social networks and linkages between people in these networks will become the guiding principle for the future Internet. The future Internet will derive from the social networks of Web 2.0 applications (Wikipedia, Flickr and Facebook, for example), where information is informally gathered and tagged. The tags of Web 2.0 accepts a greater flexibility and represents a loose and ambiguous classification developed by users themselves, which is quite different from having different groups relying on data coded in a machine-readable language as required by the Semantic Web.[71]

A combination of the two is most likely

A combination of the Semantic Web and Web 2.0 might be more realistic. According to Danish media commentator Patrick Damsted, in ten years the Semantic Web will be a basic fact with enormous influence, but at the same time the Internet will be user-driven, as users will construct the parameters used for filtering information, and as consumer trust is often higher with individual users than with companies.[72]

The social software of Web 2.0 and the semantic structure of the Internet of Things will influence the Internet and the way we use it, including email and other forms of communication between people – including all forms of letters mail. An example of a new communication platform that combines elements from Web 2.0 and the Semantic Web is Google Wave. It is a flexible communication device, which combines email and chats and makes users able to write and edit in the same version in real-time.[73] Google Wave is an open source web-based service, which contains some semantic technology as it offers extensions – based on program robots – for example spelling and grammar checking and automated translation of languages. This can help users automate common tasks, as they can build gadgets to extend and change their interaction. It can be a collaboration tool for both personal and professional purposes – e.g. scientists can share results in an

[69] The idea of the Semantic Web derives from Tim Berners-Lee, the director of the World Wide Web Consortium, who envisions this new Web as a new type of information organization based on data classification that can be read by machines through automatic semantic processing of data. Tim Berners-Lee et al., "The Semantic Web", Scientific American, Vol. 284 Issue 5, (May 2001) & Tim Berners-Lee et al. "The Semantic Web Revisited", IEEE Intelligent Systems, vol. 21, no. 3, (May 2006).
[70] Natasha Friis Saxberg, personal interview, (September 17, 2009).
[71] Anders Koed Madsen, Virtual Knowledge Democracy? - an analysis of technologies of knowledge-management as policy enablers, Masterthesis,University of Illinois at Chicago, (not yet published).
[72] Patrick Damsted, personal interview, (Septebmer 24, 2009).
[73] Jonas Salomonsen, Google Wave – fremtidens kommunikation for forskere?, Videnskab.dk, (10. September 2009) <http://videnskab.dk/content/dk/teknologi/google_wave_%E2%80%93_fremtidens_kommunikation_for_forskere>

interactive document by sharing a 'wave'. [74] This combination of user driven communication platforms with semantic elements can be relevant for future communication, because it gives people the possibility to individualize their communication to their needs and personal preferences.

What does Web 2.0 portend for B2B and B2C communications?

Over the last five years, news media and digital communications experts have been debating the future of email with many pointing towards it as a technology that will be replaced by social networking services and micro-blogging communication like Facebook and Twitter. Many commentators contend that email was better suited towards the way we used the Internet when we were dialup users bound to computers, while new generation of services that match our mobile online lifestyles. While the online debate rages, the likelihood that email will be superseded over the next ten years – especially in B2B communication – is small. Businesses have been reluctant to adopt social networking services as internal communication devices, identifying them as time wasters. According to a 2008 study by email services provider Habeas and Ipos, 65 percent of respondents believe that email will remain the preferred communications platform for businesses for the next five years.[75]

Summary

Towards 2020, the Internet will become pervasive and ubiquitous in our lives. We live in a world where mobile communications will become the most common personal interface with the Internet. These evolutions will lead to the following developments:

- **Communication becomes increasingly automated:** Automated messages are sent from doctor offices, businesses, government agencies, work, etc. to remind us of appointments, business meetings, and latest offers. Vehicles with transponder enable GPS, RFID chips in physical products, smart electrical grids, will increasingly allow objects to communicate with each, creating an 'Internet of Things.'
- **Cost of communication falls.**
- **Advanced computation and communication tools** in the hands of everybody.
- **Automation of increasingly advanced tasks that will be handled in the 'cloud'.**
- **The rise of virtual worlds** with their own virtual economy, eventually leading to a merging of virtual worlds with the real life.
- **Digitizing:** More and more physical products and media are replaced with digital versions. Newspapers are replaced by websites, books by e-readers, letters by electronic communication, CDs by mp3 files, etc.

[74] Ron Miller, Google Wave is Impressive, But is it Semantic Technology?, SemanticWeb.com (June 12, 2009). <http://www.semanticweb.com/news/google_wave_is_impressive_but_is_it_semantic_technology_139104.asp>
[75] Melissa Campanelli, "Habeas Study Finds 67 Percent of Respondents Prefer E-mail" Emarketingandcommerce.com <http://www.emarketingandcommerce.com/story/bythenumbers-1> (June 5, 2008).

Future communication customers trends – Market pull

We are entering into a new era – from mass communication to mass customized communication

Over the next ten years, the volumes of communication will continue to grow as 'communication' channels will continue to proliferate. We are going through a transition from mass communication to mass customization. To understand the changes that are occurring in communication moving forward, this section will analyze six user trends and how they will likely impact communication behavior and what users expect from other individuals, businesses and governments.

Individuals towards 2020

Towards 2020, individuals will be increasingly technologically sophisticated, become more involved in the products and services they are interested in, and live in a hybrid online/offline world, where they can be 'present when absent' and 'absent when present'. They will demand more customized products and services from governments and businesses. Individual consumers will become more environmentally conscious and want to actively engage in instantaneous or near-instantaneous dialogue with companies and governments. There will, however, remain a generational divide regarding how communications technologies are adopted, adapted and implemented.

Future businesses

Towards 2020, businesses will become increasingly networked, flat and decentralized. Businesses will seek platforms that increase innovation, lower environmental and economic costs, and allow access to global markets. These platforms will also allow for greater dialogue internally as well as with customers and suppliers.

Future governments

Towards 2020, governments will need to improve efficiency of all activities, reduce costs, and improve responsiveness to citizens and businesses' needs and function in a more commercialized environment.

6-user trends

CIFS has identified six user trends that will impact future customer communications behavior. These trends are:

1. The media prosumer
2. The situal
3. Mass customization
4. Hybridspace
5. Freetime and worklife merge
6. Overcoming the recalcitrant user

User trend 1: The media prosumer

The rise of the prosumer

Increasing education levels and technological sophistication among consumers, combined with the enabling ICT capabilities, allows for the creation of the prosumer. The word prosumer is the combination of the words 'producer' and 'consumer.' The idea of the creative prosumer has existed since the 1970s, and the prosumer has been having a significant impact on businesses and governments since then. Alvin Toffler coined the term in his book *the Third Wave* in 1980, and CIFS describes the phenomenon in detail in its book *Creative Man,* first published in 2004. The prosumer comes in three forms:

1. The consumer who wants a say-so in the development of increasingly individualized products and services from businesses and governments.
2. The hobbyist whose skills and demands go beyond those of a mere

dilettante to challenge the skills of professionals (hobbyist photographers on www.flickr.com or home improvement do-it-yourself enthusiasts, for example). This means there are fewer distinctions between home and work-life and the professional and the enthusiast.

3. The network of individuals who produce and consume online media content outside of traditional businesses and media in the anarconomy. An example of this development is the creation of Wikipedia.org, which has taken a dominant market place for online research from the established Encyclopædia Britannica, OpenOffice Software Suite, or Mozilla Internet browser.[76]

Prosumers want individualized products and services

In the developed world, we have entered an era where basic material needs, as described by Maslow's hierarchy of needs, have been met by a highly saturated market of mass-produced products and services. In order to build profit, producers must increasingly offer customized products and services over which prosumers have greater control.[77]

The prosumer is an active user of ITC tools

The prosumer is a prolific user of most social tools and programs offered on the Internet and of mobile technologies such as Web 2.0 products and services, which they use to keep in instantaneous contact with their friends and families from anywhere the prosumer is currently located. They increasingly express themselves through mobile platforms by:[78]

- Uploading their own media products or sharing their creations on Youtube.com, myspace.com, etzy.com, Flickr.com, elephantdesign.com, or innocentive.com, for example.
- Writing or voicing thoughts (on blogs, vlogs, Facebook, Twitter, etc.) and opinions throughout the Web.
- Using VoIP, VVoIP, instant messaging, and social networking services to remain in contact with those they hold important. By 2020, these would include HD-teleconferencing, advanced email applications, person-to-person streaming, and more.[79]

User trend 2: The situal

The situal defines her consumption by the context and not by a desire to have a certain identity. She used to be defined by the saying: 'I am what I am.' Her identity is now evolving to become 'I am where I am!'[80] For the situal, there is no paradox in e.g. buying discount beer for home consumption and expensive imported beer when in town with his friends – the two different situations call for different patterns of behavior. Thus, the user is able to redefine and redesign her identity in different contexts.[81] The situal is both a consumer of high-end and luxury goods as well as discount and low cost goods. The defining element is not

[76] Alvin Toffler's, The Third Wave, (1980), Copenhagen Institute for Futures Studies, Creative Man, (2004), Don Tapscott, Wikinomics: How mass collaboration changes everything (2006).
[77] Copenhagen Institute for Futures Studies, Creative Man, (2004), Free download at <http://cifs.dk/Creativeman>, p. 29, 59, and 61.
[78] William Gerhardt, Prosumers: A New Growth Opportunity, Cisco, Internet Business Solutions Group, (2008).
[79] FCC, (2009).
[80] CIFS, Creative Man, (2008).
[81] It is not unheard of that users have experimented with trans-genderism and other identity-defining changes while interacting online, although this is an extreme case. See for example <http://www.massively.com/2007/11/20/9th-transgender-day-of-remembrance-observed-in-second-life/>

the good itself, but the situation in which the good or service is needed. It is not a contradiction for the situal to buy a high-end iPhone loaded with free software and applications. As larger parts of the globe is getting access to middle class consumer habits,[82] users are less likely to fit into the predefined market segments of 2009.

Digital marketing targets situals best

Digital marketing on websites and through web searches are better suited toward capturing the situals' needs as companies like Google can help advertisers not only target consumers based on traditional marketing segmentation age, sex, income, profession, and postal code, but on personal preferences, leisure activities, frequently visited websites, and news preferences among other variables.[83] Over the coming decade, this information could be combined with geo-location services through GPS transponders in mobile communication devices to create geo-located situal marketing.

User trend 3: The era of mass customization

Increasing mass customization due to rise of the prosumer and the situal

We are witnessing the reemergence of customization on a mass scale, which was the dominant method for providing goods and services during the artisan and craftsmen period (pre-industrial revolution) due to the first two trends. During the industrial revolution, customization was replaced by mass production of goods and services, and customization became reserved for all but the richest in society. The introduction of the Internet and the accelerating ICT revolution has enabled the customization of products, services, and communication on a mass-produced scale.[84] Customers become co-designers and are integrated into value creation by defining, configuring, matching, or modifying an individual solution in an act of company-to-customer interaction.[85]

The vanishing mass-market

The vanishing mass market is a trend that has been widely reported since the publication of the book *Future Perfect* in 1987. It is a trend that is accelerating as more powerful ICT and manufacturing devices (e.g. 3-D printers) become widespread to small and medium enterprises and eventually to home producers.[86] The mass customization trend will continue to affect governments and businesses' ability to connect with and communicate with consumers.

Customers will be integrated into companies' supply chains

In effect, customers become integrated into a company's supply chain. As the number of communication devices expands, as the amount of user-produced content grows, and as the consumer becomes increasingly individualized and situational in her demand, the requirement to provide customized services grows.

ICT is enabling the effective and rapid communication required for mass

ICT is the essential element that allows governments and companies in marketing, manufacturing, call centers, and management to provide more customized products and services to customers. ICT allows for a massive increase in the variety of available customizable content without creating massive increases in cost for

[82] Jensen, Jesper Bo: Future Consumer Tendencies and Shopping Behaviour – The Development up until 2015-17, Research Paper no. 1, (2007).
[83] Ken Auletta, Googled (2009), 7.
[84] AT&T, "New Technologies Bring New Life to Mass Customization": Interview with Dr. Frank Pillman, MIT, (2007).
[85] Florent Genoux, Market Perspectives for the Mass Customization of Vehicles, carter-ist.org, EC supported project, (2009).
[86] CIFS, Anarconomy, (2009) < http://www.cifs.dk/doc/medlemsrapporter/MR0309UK.pdf> and Digital Forming at the Science Museum of London, www.digitalforming.com.

required for mass customization

companies and government. [87]

User trend 4: Hybridspace

'Hybridspace' will lead to more 'absence in presence' and 'presence in absence'

New mobile technologies will continue to give the individual person easy[88] and seamless access to the Internet,[89] blurring the distinctions between off-line and on-line world. The term 'hybridspace' is a new definition of the Internet as a part of everyday life. The Internet is no longer something which you must access through a browser and watch through the window of the computer screen. The Internet is everywhere and in any device.[90] By 2020, due to the rapid expansion of powerful mobile ICT, the communication customer will always be 'on,' moving in a flow of information in the analog world.[91] The creation of a hybrid space means that more and more people can choose to be 'absent' when physically present at a party with people they do not like while actively participating in a online (text or voice) conversation via mobile communication device with people they do like. For the people at the party, the person is disengaged and not present, but for the people with whom the partygoers are communicating online, she most definitely is 'present'. Sociologists call this activity, which is prevalent among young people, 'absence in presence' and 'presence in absence'[92]

All people achieve simultaneousness in information flows no matter where they are in the world

The user of 2020 is living in a synchronous world, where everyone has access to the same information flows no matter where they are in the world (i.e. everybody can be updated within an organization or through a news website at the same time around the world regardless of where they are located). The result is that communication is sent and received almost simultaneously and that the user *expects* this to occur.[93]

User Trend 5: Free time and worklife increasingly merge

The boundaries that have differentiated work and free-time will increasingly blur

Due to expansion of mobile communication technologies, the boundaries that have differentiated work and free-time will increasingly blur. By 2020, our free and work time will become increasingly interchangeable, as information will continually bombard us from the offline and online worlds.[94] This demand creates new challenges for employees and users. For example, when receiving a message, how quickly are they expected to respond (e.g. are you expected to respond immediately to work-related messages during your leisure time)?

Need for software

Research into email and information overload shows that the more information

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[87] Vengurlekar, Anand, "Nu er det tid til at møde forbrugeren," Marketingmagazine (October 1, 2009). <http://www.marketmagazine.dk/default.asp?Action=Details&Item=725>. Anand Vengurlekar is a former director at LEGO Vision Lab – uncovering what's next in branding innovation. More recently, he was the Director at IDEO, ranked by BusinessWeek in the top 25 most innovative companies in the world. Anand is now Managing Director at Stoic – a Danish branding & innovation consultancy that helped establish SAMSUNG as the number one CE brand in Scandinavia today.

[88] Wellman, Barry: The Internet in Everday Life, Blackwell Publishing, (2005).

[89] Rich Ling: The mobile connection - The Cell phone's impact on society. Morgan Kaufman Series, (2004).

[90] Wired magazine, (September 2009), <http://www.wired.co.uk/wired-magazine/archive/2009/09.aspx>

[91] Thomsen, Jacob Suhr: "Hybrid manifestation", FutureOrientation #3, (2009).

[92] S. Craig Watkins, 48-50.

[93] Anderson, Benedict: Imagined communities, Verso, London, (1994).

[94] Jordan, Brigitte: Living the distributed life, NAPA Bulletin vol. 30, (2008) and Laura Dabbish, et al., CSCW 06 (November 2006).

to help sorting and effectively dealing with the flow of information

individuals receive, the more they have to keep up with it on a moment-by-moment basis. Over the coming decade, more and more individuals will need software to help them sort and effectively deal with the flow of information – especially with the development of the Internet of Things and its more automated communication.[95]

User Trend 6: Overcoming ICT 'non-adopters'

Lack of broadband access in many countries

According to a recent study conducted by the US Federal Communications Commission (FCC), one-third of the US population is not active on the Internet. In many countries, significant portions of the population have not adopted broadband access. Significant efforts need to be made to avoid creating a permanently ICT marginalized segment of the population.

Factors of importance for adoption of ICT

Studies by the FCC and the International Telecommunications Union (ITU) show that educational levels, age, income, geographical location, and race (in the case of the United States) impact adoption of ICT. Gender, however, is not a relevant indicator, especially among the young. ICT use is more prevalent among the young, the highly educated, urban residents, those under the age of 50, and those who live in households with children.[96]

The number of non-Internet users ranges between 20-30 percent in OECD countries

Expanding ICT usage to the 'non-adopter' will be vital moving forward. Despite a decade of concerted effort by the South Korean government, which provided free training and online support, 17 percent of the South Korean population does not actively use the Internet.[97] Among other OECD countries, the number of non-active Internet users ranges between 20 – 30 percent. The costs of not being an active ICT user are already large and growing. Non-active ICT users have difficulty finding jobs, pay more for products and services, and have less access to information for education, health and news purposes. Please see Table 1 for more information.

Table 1: Cost of digital exclusion is large and growing – the US example (source: FCC, 2009)[98]

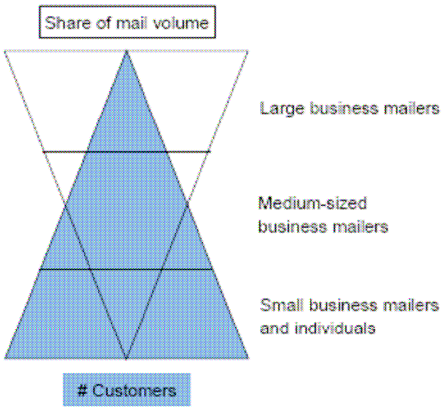
	Market Data	Implications for non-adopters
Employment	In 2005, 77 percent of Fortune 500 companies did not give jobseekers the option of responding offline to positions posted on the corporate careers website.	Getting a job is more difficult without access to online postings and ability to submit applications on line. Physical options less preferred.
Education	~65 percent of teens go online at home to complete Internet-related homework. 71 percent of teens say the Internet is was their primary source for information in completing a recent school project.	Students without broadband access at disadvantage compared to their online peers.
News	40 percent of Americans currently get most of their news information from	Non-adopters have increasingly limited resources to gather information about

[95] Dabbish et.al, (November 2006).
[96] FCC, 82, and ITU, (2008) Use of Information and communication technology among the world's children and youth, 23.
[97] FCC, 58.
[98] FCC, 83.

	Internet. Newspapers magazines are cutting staff and, as in the case of the Christian Science Monitor, go completely digital.	current events.
Healthcare	61 percent of American adults searched for health information online; of those 60 percent say online information affected a decision about treating an illness or condition.	Lack of access to information limits patient's knowledge and impacts choices and quality of care.
Consumer welfare	Study of car buyers showed that those who use online referral services and get price information online pay less than those who do not.	Consumers who only do comparison shopping in bricks and mortar shops pay more than those who comparison shop online. Poorer non-adapters suffer most.

Changing consumer expectations could change the mailing activities of large business mailers

Postal services and mail volumes are reliant on relatively few, large mailers. Understanding changing user behavior is important for understanding how postal services' largest customers, large business mailers, will communicate with their customers over the coming decade. The figure below provides a good representation of the nature of postal services' customer profile. In most countries, especially in the European Union, more than 85 percent of total letters are sent by businesses. About 60 percent of letter post is correspondence, nearly 30 percent is direct mail (i.e. addressed advertising), and more than 10 percent is publications. More than 60 percent of business mail is sent to individuals, in some countries 80 percent of mail volumes are B2C. Overall, in most countries B2C has become more important. An estimate is that roughly two thirds of letters are sent to individuals while one third is sent between businesses.[99] B2C is dominated by industrially produced transactional mail (e.g. bank statements and invoices) and direct mail. [100]



Source: ITA Consulting / WIK-Consult

Figure 9 Typical structure of a postal operator (letters business)

[99] ITA Consulting and WIK-Consult, The Evolution of the European Postal Market since 1997, Study for the European Commission, DG Internal Market and Services, (August 2009), 27.
[100] ITA Consulting and WIK-Consult, The Evolution of the European Postal Market since 1997, Study for the European Commission, DG Internal Market and Services, (August 2009), 15.

Cost cutting is a top priority among businesses today and over the next several years, according to a recent study conducted by IBM of Global Chief Information Officers (CIOs). Currently CIOs on average spend14 percent of their time figuring out how to best trim the fat within their organizations.

The future role of letters mail towards 2020

This section analyzes the future role of letters mail towards 2020. It focuses on the role that correspondence and transactional mail and direct mail will play in the communication landscape towards 2020.

Towards 2020

Mail customers become more environmentally conscious, demand more flexible services, and still want mail

Mail customers will become more environmentally conscious and come to expect more flexible and customized services from postal carriers. Consumers will increasingly demand that their mail be either delivered to online accounts or be redirected to the place that is most convenient for them to collect it (at work, local store, school or at home). They will be increasingly creative consumers that want the ability to create products and services that match their personalities and lifestyles, creating customized stamps and envelopes, for example. The creation of the Internet of Things should give all postal services the ability to allow customers to automatically trace regular letters mail shipments through email, online messaging services, and text messages, giving customers a greater sense of control and increasing postal services' reliability.

Letters mail will still have a role to play

Letters mail will remain an important business sector, although competition will increase due to market liberalization and technological innovation. Although demography will lead to an increase in the number of people who are comfortable being online and active ICT users, there will be a significant portion of the population who need and want mail services – those who are not well-educated, who are elderly, or the disabled will need a communications tool like letters mail. There are also certain mail items that cannot be digitized due to legal, cultural or other requirements. Letters mail is also more difficult to ignore than electronic communication formats. There will be some active ICT users who prefer to read documents in physical formats, though in all likelihood they will increasingly have to pay for the service.

Postal services must adapt

Postal services will need to adapt to the new challenges they will face. Their social roles in the markets they serve will also come under increasing scrutiny. The European Postal Directive highlights the need for the service to remain universal during market liberalization and emphasizes the social and economic importance of efficient postal services "as an essential instrument of communication, trade, and social and territorial cohesion."[101] As technological innovation expands communication possibilities exponentially over the coming decade and as market liberalization impacts postal operators, especially in Europe, postal operators' historical and nostalgic social role will likely change. While the need to service every house and business will remain, the question moving forward will probably be: does letters mail have to be delivered every day? The most successful postal services will be the ones that are most innovative in their range of products and service offerings over the next decade.

Correspondence and transactional mail

Future role of letters mail is a

The future role of mail as a communications medium is a contentious issue. There is a great deal of debate regarding whether ICT devices will lead to a precipitous

[101] The European Postal Directive: 2008/06/EC <http://ec.europa.eu/internal_market/post/doc/legislation/2008-06_en.pdf >

contentious issue

decline in letters mail volume. For three decades, people have predicted mail's decline. The researchers Fouad Nader and Michael Lintrell, among others, are skeptical regarding the replacement of letters mail by electronic offerings. They noted in a 2008 report that for more than a decade, mail volumes' precipitous decline has been predicted, but the decline has not happened. Letters volume has slightly declined, remained stable or increased, while the number of emails has increased exponentially. They also note that extrapolating past trends is no longer sufficient for assessing the future of mail volumes.[102] The recent economic downturn has produced accelerating downturns in letters mail volumes and a transition to cheaper classes of mail delivery for a number of national postal carriers. Automation is impacting correspondence, transactional and direct mail, so it is difficult to ascertain whether substitution is occurring or not. The liberalization of the postal market, especially in Europe, is leading to a decline in postal volumes among national carriers, but in some cases not a decline in the overall volume of letters mail.

Does the financial crisis represent the inflection point in letters mail volumes?

The question moving forward is: do the economic downturn and the massive expansion of broadband technologies represent the inflection point that leads to a trend towards declining mail volumes and a transition to online alternatives? No one knows the answer to this question, although growth in mail volumes did not occur at the same rate as economic growth rates did in the high-growth period from 2002 to 2007. If mail volume growth had followed GDP growth during this period, mail volumes should have been 19 percent larger than they were, meaning that there is an impact of substitution, consolidation and automation on mail volumes.[103] The baseline scenario presents a moderate, but sustained transition away from letters mail, as it concerns business-to-business (B2B) and business-to-consumer (B2C) correspondence and transactional mail and publications among high letters mail volume, high-income countries. Consumer-to-consumer (C2C) communication via letters mail has, for the most part, already been replaced by electronic alternatives as it concerns regular correspondence, though 'emotional' mail such as greeting cards and postcards have been slower to change and currently remain stable.[104] Direct mail, however, may increase in importance as a communications tool, as businesses' have an increased ability to direct more personalized offerings to consumers.

Most businesses have not switched to electronic alternatives

Business mail to either businesses or customers (B2X) currently accounts for approximately 85 percent of mail volumes among highly developed countries. A 2008 ECORYS study performed for the European Commission found that approximately 64 percent of the large mailers and 52 percent of the small mailers surveyed do not substitute their physical mail for electronic communication. ECORYS's study found that among surveyed companies, about 4 percent of B2X is substituted by forms of electronic communication (text messages, emails, etc).[105] However, if one looks at EU data from a 2006 Eurostat survey, 24.4 percent of enterprises among the EU-27 reported that electronic communications replaced a major portion of B2X communication that was traditionally done with letters mail. An additional four percent reported that they replaced all of their communications with digital alternatives.[106]

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[102] Fouad H. Nader, et al. Mail Trends Update: The Future of Mail. Pitney Bowes (2008).
[103] Dr. Nick van der Lijn, et al. Main developments in the postal sector (2006-2008). European Commission (2008), 36.
[104] Dr. Nick van der Lijn, et al. Main developments in the postal sector (2006-2008). European Commission (2008), 106, citing Jimenez study, (2005).
[105] Dr. Nick van der Lijn, et al. Main developments in the postal sector (2006-2008). European Commission (2008), 106.
[106] Sigrid Fickinger, Martti Lumio, Postal Services in Europe 2006. Eurostat (2008).

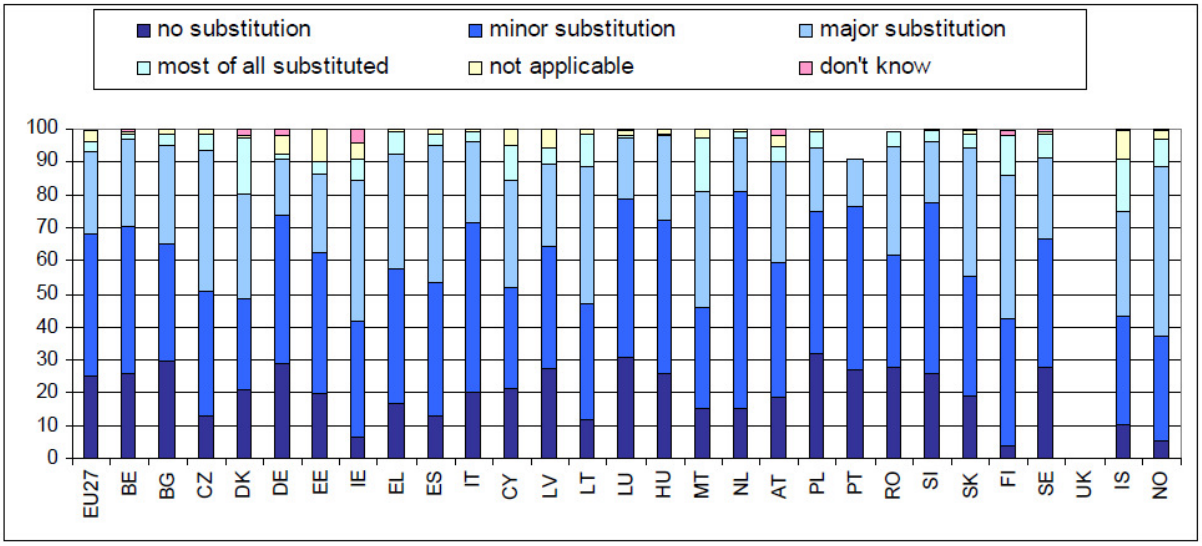

Figure 10 Extent to which enterprises with computers have substituted traditional postal mail in their communication with customers and other enterprises by electronic means of communication, (2001-2005)
Source: Eurostat, Community Survey on ICT usage and E-Commerce in enterprises, 2006

Will this remain stable or are we moving into a period of greater adoption by the majority of businesses?

Is this a tendency that will be maintained over the next decade, or is it is a signal that early adopters have emerged that will lead to a fundamental transition in correspondence and transactional letters mail? If one believes the oft cited diffusion of innovations model developed in the 1960s by Everett M. Rogers, then the approximately one-third of enterprises who have either fully or significantly substituted letters mail in their communication with customers could be the 'innovators' and 'early adopters'. These innovators and early adopters could lead the diffusion of innovations that will change a population's communications behavior concerning correspondence and transactional mail. Innovators and early adaptors are a minority, while the vast majority of businesses and consumers must become familiar with new technology products before they are willing to trust and invest in them.[107]

Major banks and telecommunications are changing consumer behaviors

There appears to be some evidence that this trend is expanding as businesses and governments' transition towards ICT alternatives. Verizon – the US telecommunications giant – is promoting a shift to paperless communication with its go-green campaign. T-Mobile will begin charging its customers $1.50 for receiving a paper bill. Financial service companies – like Vanguard – and insurance companies like USAA are also leading the drive towards e-substitution of correspondence and transactional mail. The Finnish and Swedish governments began sending e-invoices in 2008, and the Finnish government plans to receive all invoices electronically by the end of 2009.

The decline in correspondence and letters mail will vary nationally

Due to the national and highly fragmented nature of postal services and the varying long-term impacts of the economic downturn among IPC member countries, the speed of volume declines will vary. Cultural norms, differences in market maturation, political decisions and legal barriers could either slow or accelerate the

[107] Moore, G.A, Chasm, West Sussex, Capstone Publishing Limited, (1991/1999), 11.

digitalization of correspondence and transactional mail. For example, Danish consumers are already exceptionally high users of e-invoices among high mail volume countries. Only 32 percent of consumers receive physical invoices compared to over 75 percent of consumers in Scandinavia (Sweden, Norway and Finland) and Germany.[108]

Though mature, ICT sophisticated, high-income markets may experience the greatest declines

The mature postal markets that have high-levels of broadband penetration in the United States and Northern Europe will likely experience the most significant declines in correspondence and transactional mail volumes. The countries with mid-level and low-level per capita letter volumes may continue to achieve growth in B2X correspondence and transactional mail due to the impact of increasing economic growth and wealth increases on mail volumes. Increases in individual and household wealth are correlated with higher mail volumes as the number of relationships between the consumer and businesses increases (especially with banking and financial institutions). It is important, however, to ask if the market developments that high-income countries previously experienced will also hold true for lower income countries. With ICT, many low-income countries are skipping stages of development that high-income countries once experienced (development of mobile technology in developing countries, for example). Over the next decade, will customers in mid to lower letters mail volume countries – especially among the young – prefer to have transactional mail? Or, will they – as in the Baltics – transition more rapidly towards ICT adoption?

Table 2: Indicators that will impact mail growth	
Indicators that have a positive impact on mail volumes	
↑	Population growth
	Household growth, including an increase in the number of smaller households
	Growth in number of businesses
	Economic growth
	Growth in household incomes
Indicators that have a negative impact on mail volumes	
↓	E-substitution
	Broadband penetration rates, speed and quality of access
	Consolidation of mailings
	Development of 'no thank you' options: i.e. opt-out and opt-in options
	Speed at which indicators are changing, creating signs of acceleration

CIFS has developed four scenarios for future volume declines

CIFS has developed four scenarios for how the evolution in correspondence and transactional letters mail markets could occur. These scenarios are presented from a 2020 perspective:

1. Low growth: (0 – +1 percent CAGR per year starting in 2010)
Once again the calls for the decline of correspondence and transactional mail have been premature. The decline in mail volumes experienced in 2008-2010 was related to the economic crisis. Growth is slow because Western economies have struggled to pay down excessive debt and the full economic effects of an ageing population has taken effect. Correspondence and transactional mail remain important marketing and

[108] Dr. Nick van der Lijn, et al. Main developments in the postal sector (2006-2008). European Commission (2008), 106 citing Jimenez study, (2005), 56.

communications tools, as they are an important ways for building relationships with consumers. Hybrid mail offers companies a cheap, less environmentally costly communication tool for communicating directly and personally with consumers and businesses. As a result, mail volumes stabilize in 2010, and even grow slightly over the coming decade among mature post markets.

2. Limited or Slow decline (0 – -1 percent CAGR per year)
The present steep declines in letters volume experienced by postal carriers in 2008/2009 were due primarily to the recession. Once the economy recovered, mail volumes stabilized. Over the course of the next decade, the introduction of new mail services (hybrid mail, outsourcing of mail preparation and delivery to postal services) and the impact of technical and legal barriers as well as cultural preferences slowed the decline in correspondence and transactional mail. E-substitution occurred. Renewed economic growth and the ability to choose the format by which B2X communication occurs (physical or electronic) leads to limited or slow declines in mail volumes. By 2020, mail volumes declined by approximately 10 percent below their 2009 levels.

3. Moderate decline (-2,5 percent CAGR per year)
Mirroring the growth experienced in the 1980s, the growing speed and quality of broadband connections leads to a fundamental change in public and business behavior. The economic downturn created economic incentives to a shift towards electronic substitution in B2X communication among businesses and governments. Governments and businesses continue to offer the mail option, but it comes as an extra cost that many customers are still willing to pay for. Natural demographic changes are creating a public that is more open to receiving electronic communications. The introduction of hybrid mail solutions is enough to staunch the decline in correspondence mail volumes, which have fallen by approximately 20 percent below their levels in 2009.

4. Fast decline (-5 percent CAGR per year)
The worst economic downturn since 1929 combined with increasing environmental concern and the explosive growth in widespread and increasingly mobile penetration of broad technologies leads to a sustained transition away from letters mails in correspondence and transactional communication. By 2020, the Internet has reached 26 years of age and is creating a fundamental behavioral change among consumers of all ages who can access their accounts, personal information and data at any time and from anywhere. By 2020, correspondence and transactional mail volumes in mature postal markets have declined by 40 percent below their 2009 levels.

Regardless of the scenario for future correspondence and transactional mail volumes, the introduction of new technologies over the next ten years will alter postal services, making extrapolations based on historic data less helpful. The introduction of hybrid mail solutions and the substitution of letters mail with electronic alternatives will grow increasingly important and change postal services logistic chains.

Direct Mail – a changing market

Direct mail remains important

Although online advertising is growing in importance and for the first time has overtaken TV advertising in 2009, direct mail will remain a strong sector for postal carriers over the next decade. Advertising mail is directly related to economic

growth, so it remains to be seen how quickly direct mail returns to pre-crisis levels. Technological improvements are leading to development of better consumer data, better printing qualities, and new forms of hybrid analog-digital advertising, which will lead to new ways to communicate with consumers through direct mail. In addition, physical mail will be one of the ways for advertisers to circumvent digital filters and communicate directly with consumers over the next ten years.

Direct mail circumvents some digital filters

Our societies will become more 'digital' towards 2020, and we will be experiencing increasing degrees of augmented reality. In order to deal with the increasing bombardment of digital information from, for example, geo-based advertising, we will increasingly rely on digital filters to sort out messages we do not want from the increasingly pervasive Internet of Things that surrounds us. Direct mail's ability to communicate directly with the consumer could increase the value of targeted mailings that make use of increasingly sophisticated customer databases to conduct lower volume, targeted mailings or higher quality mass mailings that are less costly to produce and distribute.

Some consumers satisfy certain emotional needs or desires when interacting with direct mail, for example to relax and unwind, stay in touch with what is going on, and indulging or enriching themselves.[109] Mixing digital technologies through, for example, quick response codes could lead to a complementary relationship between analog and digital advertising formats and create more robust mailings. For example, augmented reality could allow consumers to hold a direct mail up to scanners on their cell phone, television or computer monitors and see a 3D rendering of the product that a particular advertiser wants to sell. General Electric has produced an example of the future of the smart grid using augmented reality. This is an example of how the analog and digital worlds could merge via direct mail towards 2020. To test this new augmented reality for yourselves visit: http://ge.ecomagination.com/smartgrid/#/augmented_reality, follow the instructions on the screen and hold up the picture of the solar panel below in front of your webcam.

[109] US Postal Service and InnoMedia, "The Role of Mail", (2005), USPS, 2005, <http://www.usps.com/directmail/_pdf/RoleofMail.pdf>

The emotional aspect of direct mail

The growth of 3D printing could allow mailers to include individualized samples of their products that the producer could design specifically for the consumer in order to differentiate themselves from the crowd. It remains unlikely that in 10 years time ICT will be able to generate smells and tactile sensations. Online advertising formats cannot compete with this form of communication.

Baseline scenario 2020

Purpose of scenario

A scenario is a description of a future business circumstance, imagined on the basis of past and present trends, uncertainties, and assumptions regarding future developments. This word-picture depicts the anticipated interactions of external agents (such as competitors, customers, suppliers) and conditions (economic and regulatory environment, for example). A scenario aims to highlight the associated opportunities and threats of the future.

Through the creativity, dialogue, investigation, and analysis that are part of a well-structured scenario process, one may be enabled to peer around the corners of the future and think through and plan for discontinuities before they occur. The following presents a baseline scenario for the future social, economic and political environment that postal services will find themselves a part of in 2020.

World Economy

Unemployment remains a problem

The effects of the financial crisis that started in 2008 are still felt. The optimism that many felt in 2009 was largely unfounded. Unemployment kept growing through 2010, though at a slower pace, and in 2020, unemployment among European countries is still greater than it was in 2005. Advanced automation has made many jobs obsolete and has also raised the bar for minimum job qualifications. The threat of unemployment led to more cautious consumption patterns, which in return slowed economic growth. In addition, the population in developed countries as well as in China has seen an increase in the number of unproductive elderly, many of whom have lost large parts of their retirement savings due to bad investments.

Western economies stagnate, while Asian economies flourish

Western nations, Japan, and South Korea have had fairly slow growth rates of about 1 – 1.5 percent since 2010, barely enough to recover losses from the crisis. Growth economies like China, India and Brazil are doing better with about 5 -10 percent annual growths. This means that the economies of these nations have increased 60 – 150 percent in a decade.

The focus is on building efficiencies and automation

Still, the overall spirit in 2020 is one of general optimism, even in the Western nations. The feeling is that the worst is over. The long aftermath of the crisis has been used to make much-needed systemic changes in the economic system. Regulations curtail excesses, and streamlining of the financial systems has created greater openness and transparency, which has done much to address the huge pre-crisis disconnect between real and nominal values of stocks, housing and derivates. The reduced economic pace in the previous decade has also done much to reduce greenhouse gas emissions, and many stimulus packages have focused on building 'green' infrastructure such as alternative energy sources, recycling plants and zero-energy housing – all of which save energy and money in the long run as well as being good for the climate.

Free, online content flourishes

The crisis also led to greater focus on making use of the growing volume of free content (knowledge, software, entertainment, etc.). This has led to savings for companies, private citizens, and public organizations, and it can be seen as an extra growth in value that is not reflected in economic growth, as traditionally measured by GDP.

Demography

Ageing populations - not just in developed countries

Ageing populations is a worldwide trend. Between 2010 and 2020, the number of 65+ years old has increased by about 190 million. The trend is not limited to developed countries.[110]

Better ICT skills

Most people in 2020 have grown up with the Internet. 54 percent of the world's population is born after 1977, when the Internet was introduced, and many more have had Internet since their teens. Mobile phones have been near ubiquitous for almost two decades. Practical ICT skills have improved for two reasons: More people have spent time with computers, and software has become user-friendlier. Even illiterate people can use computers through touch screen icons and voice interfaces.

Better overall education

The level of education has improved vastly in developing countries. Access to knowledge and learning systems on the Internet, with decent automated translation eroding language barriers, has played a large factor in this. Even in developed countries, the proportion of people with tertiary education has increased, in part because more people choose further education, and in part because of immigration of educated people from developing countries.

Increased mobility

Physical mobility has increased because of improved transportation infrastructures. Improved fuel efficiency of modern airplanes has offset the increase in fuel prices. In developed regions, networks of high-speed trains connect metropolises. In developing countries, inexpensive electric cars like the Indian Reva have become available to the middle class. These cars can be fueled locally by a selection of power sources, reducing dependency on oil supply. Mental mobility, in the sense of greater willingness to accept change and new ideas, has also improved because of better education and global communication.

Mobility makes home addresses less important

As the network society gets a footing in both developing and developed countries, the increased mobility influences how the individual perceives her home address. The key is to reach the users where they are.

Family life

The nuclear family remains idealized, though less the norm

The nuclear family remains the ideal in most cultures, but the difference between ideal and reality is growing. With greater financial independence for women and better opportunities for childcare, families are not bound as much by mutual dependencies as before. A growing trend is 'serial monogamy', where couples move together for some years and then move apart when the relationship grows stale. When children are involved, this creates 'network families', where a child may live with a half brother and a stepsister, and have a full sister living with another parent. These are not broken families as much as they are brought-together families.

Networks replace small families as

Network families are just a part of the extended social networks that modern people have, and which they learned to rely on during difficult recession years. It is just as

[110] UN Data, <http://data.un.org>

basis for support

common to turn to a friend or former colleague when in need of a new home, a new job, or a loan, as it is to turn to one's family.

Declining birth rates reinforce the network trend. The majority of young people are only children or has just a single sibling, and they have far fewer cousins than earlier generations. This makes it necessary to rely on social networks simply because there is less family to rely on.[111]

Leisure

The Internet is increasingly popular, as are customized products and services

The Internet plays an increasingly important role in leisure time pursuits, both as a place to find content and as place to spend time in virtual worlds. This has created a counter-trend market for unique and personal real-life sensual experiences. The loser is mass-produced entertainment that offers neither unique experiences, nor the physical sensations of real-life interaction, nor the interactivity of the virtual worlds on the Internet. The attendance of live concerts is increasing while record sales are declining. Hollywood blockbuster fantasy movies are losing out to MMORPGs and live role-playing. However, the recession has meant that the majority rejects expensive choices. Though you can go see the Rolling Stones (still touring in 2020), you may get just as good an experience seeing an up-and-coming band playing at a small venue. You do not necessarily need to travel to the other side of the world to find interesting vacation spots. The Internet makes it easy to find the offers that are just right for you.

Creativity is increasingly in focus

User involvement is a growing trend in leisure. Rather than being passive recipients of entertainment produced by others, people want to become involved in order to get a deeper experience. Creative pursuits, where the participants try their hands at writing, theatre, music, painting, crafts, role-playing, historical re-enactment, etc., are increasingly popular, particularly if there is interaction with other participants or an audience. Creative tourism is also on the rise. Even physical exercise should be interactive and meaningful, such as games or dancing, rather than just jogging or working out.[112]

Consumption

Consumption begins to shift away from the conspicuous towards the creative

While overall consumption has grown in the last decade, conspicuous consumption has declined since the pre-crisis glory days. In particular, money is saved on expensive items like cars, expensive luxury brands, and designer furniture. A small car gets you just as well from A to B as does an SUV – and it is easier to park. Old furniture found at flea markets or in thrift shops can, if restored properly, have more identity than new designer furniture. It is not that people cannot afford the more expensive choices; it is more that they are seen as antisocial or bad for the environment. Luxury markets that provide sensual experiences have not suffered much. Tailor-made goods, restaurants, microbreweries, wellness clinics, and holiday resorts are all doing well.

Internet retail

Retail stores are facing increasing competition from Internet stores. On the Internet,

[111] A survey done 2007 by MTV shows that, in developed countries, youths rely more on friends than family for advice and help. MTV and The Associated Press Release Landmark Study of Young People and Happiness, New York, (August 20, 2007), www.mtv.com/thinkmtv/research

[112] The growth of creative leisure and consumption is explored in CIFS's book Creative Man (2004, 2006)

stores challenge bricks and mortar alternatives

the selection is far greater, you can quickly find what you are looking for, no matter how obscure, and it is easy to compare prizes. For the most part, postal services are used for delivery, though some of the larger Internet stores have joint pickup stores in major cities. Internet trade has benefited developing countries in two ways: first, it makes it easier to sell their products abroad, and second, it vastly improves the range of products available to their rapidly growing consumer classes.

New technology has made personalized digital design possible

Creative consumption is a growing trend, particularly in the developed countries. Having designed or restored some item, in full or in part, is associated with more status than simply buying something, and it also better reflects who you are. Many people have access to digital lathes, 3D printers or other flexible, automated production tools, which makes it far easier to turn a personal or personalized digital design into reality. Handicrafts are no longer restricted to people with large workshops and oceans of time – it is easy, simple and cheap to create stuff with modern technology.

The cost of digitized mass-produced products and services decrease

The cost of digitized, mass-produced products has been reduced to next to nothing. For one thing, there is a rapidly growing volume of free content on the Internet, either in public domain or given away under 'copyleft' licenses. For another, it is very easy and almost risk-free to pirate copyrighted content, making it impossible to charge high prices for such. On the one hand, this has reduced the commercial market for mass-produced software, entertainment, knowledge, and news; on the other hand, it has freed consumers' money for other products – particularly unique products and personal experiences.[113]

Mass market brands suffer

A general, long-term consumer trend is the growth of discount and premium products and stores at the expense of the mainstream.[114] The recession did not stop this trend, except for hurting the very high end and strengthening discount even more. It has become increasingly difficult to sell products that are not either basic quality or above-average quality. Branded products that offer no extra qualities but a famous brand name have lost ground to either 'no-name' brands or brands that offer objectively superior quality.

Business

Businesses focus on streamlining and increasing productivity

In order to save money and increase productivity in the wake of the crisis, most companies have cut down on bureaucracy and streamlined their processes. This has largely been successful, but has contributed to overall unemployment due to layoffs. The most successful companies have been those that offer real value for money, whether low cost or high quality. Immaterial qualities like design and storytelling are still important, but only those that truly have something unique to offer have survived. Empty add-on stories to products, no matter how glamorous or macho the stories are, have largely ceased to attract customers.

Small and medium-sized enterprises share resources

Many small and medium-sized companies have made partnerships to share certain resources, e.g. linking their computers in grids to share computing and storage capacities or having common meeting rooms and cafeterias. Some companies have chosen to go virtual, having no physical offices.

[113] Read more about this in CIFS's members report #3 Anarconomy, (2009).
[114] According to e.g. an international survey done by McKinsey in 2004.

Constant communication with customers and suppliers is vital

It is increasingly important for companies to be in constant communication with their customers. Users of a product help provide suggestions for improvement, and often customers desire individualized products tailored to their specific needs. In fact, the boundary between producer and consumer is often blurry, because customers assume a kind of partnership with a producer, becoming prosumers that voluntarily take part in product development and marketing and sometimes even get paid for it.

The most adaptable companies survive

The most adaptable companies have survived the crisis best, while dinosaurs clinging to outdated business models have perished. In particular, companies playing the role of middleman have found it hard. The Internet makes it easy for customers to link up directly with providers of products and services, making it easy and profitable to cut out any unnecessary intermediaries such as record companies, advertisement agencies, non-food retail stores, video rentals, and even savings and loans banks. In return, direct delivery of digital and physical items from producer to customer has grown.

Increased benefits for companies that use social software

Social software platforms have changed business and organizations by making possible a new way of coordinating work within companies, or between companies and their partners or customers.[115] In 2020, the hype of Web 2.0 has turned into everyday – Web 4.0 is becoming the new hype with more intuitive ways of mixing text, with speech and camera-conferences across mobile and stationary platforms.

The advantages

The system can be defined as a "system of web-based technologies that provide rapid and agile collaboration, information sharing, emergence and integration capabilities in the extended enterprise".[116] This is an opportunity to revolutionize the way organizations interact, innovate and develop.[117] According to MIT scientist Andrew McAfee, Wikis, blogs, group-messaging software etc. can make a corporate intranet into a collaborative platform that reflects the way work really gets done.[118]

Social media marketing

Today, more and more companies use social media channels to share information, build relationships, strengthen brands and increase business prospects. When executed properly, a solid social media marketing strategy increases marketing's return of investment substantially. [119] This means the end of mass communication.

Work life

Job security becomes

Given the overall increase in unemployment, job security has become more important. The 'flexicurity' known from Scandinavian companies works best in

[115] For more see Andrew McAfee's Blog: "The Business Impact of IT" (2009) http://andrewmcafee.org/blog/ or his book "Enterprise 2.0: New Collaborative Tools for Your Organization's Toughest Challenges, Harvard Business Publishing, (November 2009).
[116] Carl Frappaolo and Dan Keldsen: "What is Web 2.0?, Web 2.0 technologies provide the means and tools for organizations to leverage the Internet as part of their enterprise platform and architecture." Association for Information and Image Management, (2008), <http://www.aiim.org/What-is-Web-2.0.aspx.>
[117] Woodward, David,"Social workers", Director magazine, (August 2008) <http://www.director.co.uk/MAGAZINE/2008/8%20August/enterprise2.0_62_1.html>
[118] Andrew P. McAfee: Enterprise 2.0: The Dawn of Emergent Collaboration, Management of Technology and Innovation, MITSloan Management review (April 1, 2006), <http://sloanreview.mit.edu/the-magazine/articles/2006/spring/47306/enterprise-the-dawn-of-emergent-collaboration/>
[119] Joshua Thorvid, VP, Marketing at Reaman Marketing Solution Inc., Ethnography Forum Linked-In, (October 2009).

increasingly important

times of growth, less so during an extended downturn. Free agents and consultants struggle to get by, and many have been forced to take part-time jobs at lower wages in order to get by between contracted jobs.

Automation of service industries raises bar on labor market qualifications

Increasing automation by advanced computers and robots has raised the bar of minimum labor-market qualifications, marginalizing a growing group of unskilled labor. Re-schooling this group is a major task for governments, labor unions, trade schools and colleges. Increasingly, 'soft' competencies like creativity, social skills, communication, and adaptability become important, because 'hard' competencies tend to be automated more easily.

Hobbies become business activities

Many run small leisure-time businesses on the side, often in arts and crafts or personal services. Besides supplementing regular income, this becomes something to fall back on if unemployment strikes. Perhaps the 'hobby' can become a new main occupation. Rules regarding unemployment benefits have become more flexible, allowing some income on the side from such activity. This is an advantage to both the worker and the society, which needs more entrepreneurs.

Communication

Communication is almost entirely digital as it is cheapest and most direct

Most communication is handled digitally, though by all means not all. Letters mail remains important, though transactional and correspondence mail volume has declined steadily since 2009 and is now down 20 percent in most high-income markets. Digital communication is the cheapest and most direct, and it allows real-time communication of sound, images, text, and even, to a limited extent, touch.[120] It is also easy to port items between platforms. Virtual communication environments of all sorts are increasingly common.[121] There are also environmental concerns with physical communication on paper, since it costs energy to make, transport, process, and recycle paper. Saving on paper communication also saves money and cuts costs, whether you're a company, a public organization, or a private citizen.

Media consumption becomes more pull-oriented

Media communication tends to be more 'pull' than 'push'; i.e., the media users seek specific media content where and when it suits them, rather than having to make do with what old-fashioned media channels choose to make available on any particular day. Advanced search engines and open content portals make it easy to find exactly what you want, if it exists, and get it immediately. This has to some extent leveled the playing field, making small content providers more competitive against big-media dominance.

Physical distribution is still needed, however

This in no way means that physical distribution is dead. Many people and companies still prefer letters mail, and many products, from contact lenses and perfume bottles to blood samples and original art, are sent by physical mail. Communication by paper offers tactile sensations that cannot be replicated digitally, and since physical communication is much more expensive than digital communication, it is also seen as more exclusive and shows that the sender has made a particular effort.

[120] Using devices like the Hug Shirt: <www.cutecircuit.com/projects/wearables/thehugshirt>
[121] E.g. future versions of Sun's MPK20 virtual workplace, Sun Microsystems, "MPK20: Sun's virtual workplace", (Retrieved November 12, 2009) <http://research.sun.com/projects/mc/mpk20.html>

'Digital' distribution of physical products

However, even some physical products are 'distributed' digitally in the sense that digital blueprints are downloaded to 3D printers that can make physical items locally. This includes advanced products like cheap electronics, designer houseware, and art objects.[122] Bookstores print paperback books on demand.[123] Piracy of copyrighted blueprints is a problem for commercial developers, but there's a large volume of open source designs available for 3D printing.

Using the Internet to send paper mail

Hybrid mail solutions grow increasingly important. PoIP (Post-over-Internet-Protocol[124]) is a hybrid mail solution that lets users send paper mail digitally directly from their computers to recipients anywhere in the world. Post via the Internet offers speedier delivery and reduced emissions as printing and mailing are done locally.[125]After creating a document in Word, Outlook or other applications users print by selecting ViaPost or BlueMailCentral from the printer list to send their file to local printing partners in the area or country of destination. There the letter is printed and delivered to the local post service who take the mail the final few miles.[126]

[122] See Wikipedia, 3D printing, <http://en.wikipedia.org/wiki/3D_printing> and Duncan Graham Rowe,"Gadget printer' promises industrial revolution", New Scientist, (January 8, 2003), <www.newscientist.com/article/dn3238>
[123] Alison Flood, "Revolutionary Espresso Book Machine launches in London", guardian.co.uk, (April 24, 2009), <www.guardian.co.uk/books/2009/apr/24/espresso-book-machine-launches>
[124] Oliver, Jamie, "Suffering SMEs turn to alternate mail services", Telegraph.co.uk, (October 22, 2007), <http://www.viapost.com/images/pdf/Telegraph_-_Suffering_SME_s_Turn_to_Alternative_Mail_Services..pdf>
[125] FAQ, BlueMailCentral.com, (2009), <www.bluemailcentral.com/en/faqs>
[126] ViaPost, who are situated in the UK, use Royal Mail because they according to ViaPost have an incomparable service for door to door delivery and are most efficient at delivering the final mile. <http://www.viapost.com/content/view/14/>

Conclusion

Mobile and broadband technologies will create new consumer and business demands

Widespread penetration of broadband and mobile technologies, which are increasing in speed and quality, represents a fundamental tipping point that will change consumer and business behaviors and expectations towards communication and communications technologies, including letters mail. The communications environment will be radically different ten years from now.

Several trends point towards a stagnation of mail volume growth at best and severe decline at worst

Although predictions of mail's decline have not come to fruition, several factors are coming together that point towards a stagnation of mail volume growth at best or significant decline at worst. Economic growth will in all likelihood be anemic among most IPC member countries for much of the next decade. Environmental concerns are growing, and while many could debate the environmental costs between letters mail and electronic communications, ICT has ancillary benefits. ICT provides for communication between things as well as people (i.e. the creation of smart homes and electrical grids), which will lead to increasing energy efficiencies in the economy as electricity consumption is better utilized by all economic actors. Governments and businesses will increasingly focus on reducing costs and increasing productivity. E-governance and e-commerce is growing in importance and many governments and businesses will increasingly use economic incentives to change customer behavior towards e-substitution. Natural demographic transitions will lead to an increasing majority of people who have grown-up using ICT technologies and will, in all likelihood, be much more likely to use ICT to increasingly replace correspondence and transactional mail.

ICT developments also offer opportunities to develop new products and services

Letters mail and especially direct mail are not 'dead' as communication devices. Technology developments – increasing automation, for example – and the introduction of hybrid mail will permit postal services to offer more flexible and personal services for their customers. While ICT developments represent a threat to postal services, they offer opportunities to develop new products and services to take advantage of the fusion of analog of digital worlds that will occur over the course of the next decade. Augmented reality and the merging of pixels and paper will allow for the development of new ways for companies to use letters mail to communicate with consumers. Mail can be held to mobile phone and computer cameras to create 3-D images of products that customers purchase. Increasingly accurate customer databases could permit the disbursement of highly targeted advertising that lead to more valuable, but lower volume distribution. It will also lead to production of higher quality mass mailings that cost less that they do today.

Most innovative postal services will thrive

Market liberalization and the development of new technologies will lead to an increasing number of mergers among postal carriers and a fundamental redefinition of the postal service's role in society among IPC member countries. The companies that will be the most successful are those that take the time to think through opportunities and threats that ICT developments represent to develop new products and services.

Broadband speeds requirements vary by application type – Examples from medical, government, commercial, educational and communication usage[127]

	Content Type	Example applications	Actual download speed demands (Mbps)
Non-real-time	**Basic download (or upload) usage**	• E-Book / Digital Textbook downloads • Basic search applications • Basic email • Web-browsing, job search, government website access (downloading basic government forms & e-Government 1.0) • Email communication & scheduling • Wellness programs (e.g. Nike+) • E-prescriptions	0.1-0.3 (speed impacts down/up time and render) 0.2-0.5 (speed impacts down/up time and render)
	Large download (or upload) usage	• Advanced, interactive online transactions • Advanced web-browsing, iTunes • Online learning systems • Student data systems • Professional learning and support systems • Social Networking, P2P, etc. • Medical Records download/sharing • Google-Health • Onrad • NightHawk • Singleton Diagnostic • Academic research	0.5-5+ (speed impacts down/up time and render) 1-10+ (speed impacts down/up time and render)
	Streamed audio	• Replay live educational events, conferences, concerts, & radio • PBS, Rhapsody	0.1-0.3
Real-time	**Voice over the Internet (VoIP)**	• Advanced telecommunications • Skype, Vonage, Custom VOIP • Remote consultation	0.1-0.3 Symm. 0.2-0.5 Symm.
	Basic Interaction	• Pogo online games • Educational 'serious' games • Aleks (online interactive education)	0.3-0.5 Symm.
	Basic Streamed Video	• User created video (Youtube, classroom demo's, model instruction, certification of professional development) • C-SPAN, YouTube (White House Congress)	0.3-0.5
	Video Conferencing + VoIP	• Videoconferencing for private, instructional or professional development	0.6-1.0 Symm.

[127] FCC, 23, 99, 121, 127

	• Basic / lower definition telemedicine	0.2-2.0 Symm.
SD Streamed video	• Streamed classroom instruction • Multi-cast conferences and meetings • Hulu • Real-time online health care consultations	1-5 2-10 Symm.
IP TV	• Self-directed learning modules • IP TV	1-5+ Symm.
2-way advanced video interaction	• Real-time simulation learning and training (National Institutes of Health, Veterans Affairs) • Real-time interactive experiences & gaming • Remote instruction /classroom interaction • Collaborative professional development	2-5+ Symm.
Enhanced video teleconferencing	• Immersive instructional coaching • Real-time video teleconference and TeleLearning • Remote imaging (National Institutes of Health, veterans Affairs) • HD Telemedicine (diagnostic imaging) • Advanced telemedicine • Streamed procedures and diagnostic information	5-10+ Symm. 10-20+ Symm.
HD streamed video	• Rich content media for learning • Broadcast quality High Definition Television (HDTV) (NASA Multimedia) • HD streamed University lecture • Remote procedures	10+ 20+
Cloud Computing	• Cloud-based applications • Consolidating of data centers	20+
Remote Access Data	• Telecommuting / continuity of government	2-10
3D HD Streamed video and conferencing	• Telecommuting • Virtual Offices • Entertainment	100+

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