E-commerce transaction volume

Both the transaction volumes for Internet-based e-procurement and e-sales in Switzerland have steadily grown over the past three years. The leading sectors with respect to the transaction volume for e-procurement are ICT-research, watches, retail, textile and construction. The leading sectors with respect to the transaction volume for e-sales are hotel and restaurant industry, industry, retail and wholesale. Observably, there is no single sector that is leading in both e-procurement as well as e-sales.

The number of students and apprentices undergoing ICT education and training has grown dramatically since the mid-Nineties, and e-sales in Switzerland have steadily grown over the past three years. The leading sectors with respect to the transaction volume for e-sales are hotel and restaurant industry, retail, textile and construction. Obviously, there is no single sector that is leading in both e-procurement as well as e-sales.

E-procurement is highest for the modern service sector and in the high-tech industry. The growth of e-procurement between 2000 and 2002 was much over the years. E-procurement in 2002 was slightly higher after stagnating between 1990 and 1995.

The leading sectors with respect to the transaction volume for e-sales are hotel and restaurant industry, retail, textile and construction. Obviously, there is no single sector that is leading in both e-procurement as well as e-sales.

Type of Education

<table>
<thead>
<tr>
<th>Type of Education</th>
<th>FLVE</th>
<th>PROF</th>
<th>PRO</th>
<th>HS</th>
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</table>

ICT uses in Switzerland for different types of enterprises, development 1990-2001

ICT degrees of freedom for different types of enterprises, development 1990-2001

Average percentage of purchase value and turnover

- FLVE: enterprises with fewer than 50 employees
- PROF: enterprises with 50 to 249 employees
- PRO: enterprises with 250 to 499 employees
- HS: enterprises with 500 to 999 employees
- TE: enterprises with 1,000 or more employees
- HS: enterprises with 500 to 999 employees
- UAS: universities of applied sciences
- UNI: universities

The Swiss Federal Statistical Office (FSO) is participating in the FIPS research project SEAMATE, Socio-Economic Analysis and Macro-modelling of Adapting to Information Technologies in Europe. The objective of SEAMATE is to estimate the magnitudes for the first time at a EU level, of the socio-economic impact of information and communications technologies (ICT) on the EU-15. The SFSO is involved in working package WP 6.1, statistical indicators and data needs. The focus of ICT indicator definition has evolved over the years, from readiness, to intensity, to impact, and finally to outcomes. We will present in this paper a bottom-up approach to include a dynamic ICT system view, that puts the decision makers at the core of the model.

Based on this system view, the SFSO has adopted an inductive, hypotheses-driven approach, that puts the decision makers at the core of the model. The SFSO has extended this approach to include a dynamic ICT system view, that puts the decision makers at the core of the model.

Benefits of ICT grow exponentially with the number of users (network effects) Intangible factors have stronger influence on the users' decision to adopt ICT is heavily interconnected and so are ICT decisions (interconnectivity) The market leading technology is not necessarily the best one

Policy

- «Which policy actions motivate users to adopt ICT?»
- «Which types of impacts cause users to adopt ICT?»

Information society indicators are developed in the framework of the Information Society Coordination Group (ISCG) set up by the Swiss Government in 1996. The project takes its lead from international initiatives on indicator development headed by the OECD and Eurostat. Information society indicators contribute to discussions about the threats and opportunities of the information society, making it possible to evaluate the Swiss economy's ability to adapt and highlighting the problem of the digital divide in the general public.

Indicators for the information society in Switzerland

Indicators for the information society describe the infrastructure, the production and the use of information and communication technologies (ICT) in the various areas of society (households, enterprises, education/training etc.). The economic and social significance of ICT is growing in modern societies. The presentation of trends is of interest to decision makers in government, business and society. The information society indicators provide information about the different areas of the information society in Switzerland.
In July 2001, Switzerland had 74 hosts (computers linked to the Internet and maintained by a third party side) per 1000 inhabitants (compared to 21 in July 1997). This infrastructure is more developed in the United States, Canada and the Scandinavian countries in particular.

In 2002, Switzerland had one of the highest percentages of telephone main lines worldwide (73 lines per 100 inhabitants).

The number of websites in Switzerland (20 websites per 1000 inhabitants) is rather high, but foreign trade in ICT is less important. ICT education and training should mean a marked increase in the number of specialists at the economy’s disposal in a few years.

The use of ICT in Swiss enterprises, especially e-mail and the Internet, has most strongly grown between 1997 and 2000. Various reasons are responsible for this relative slowdown of ICT adoption. Several ICTs, such as e-mail, Internet, PC and work stations are already being used by almost 100% of all enterprises. This holds especially for Intranet, Extranet, and broadband technologies. Noticeable differences are also prevalent across sectors but not between industry and service providers.

In 1995, 1996, and 1997, the number of mobile phone subscribers per 100 inhabitants in Switzerland was 13, 18 and 21 respectively. In 2001, Switzerland had one of the highest percentage of individuals using a mobile phone per inhabitant (90%) but a rather low percentage of individuals finding information about goods and services on the Internet.

Switzerland had in 2002 1.7% of the households’ total expenditure. In 2001, telecommunications services (without Internet services) were the major ICT expenditure category in Switzerland; expenditure represented 3% of the households’ total expenditure.

According to the OECD, Switzerland had in 2001 the highest percentage of individuals using e-mail (90%) but a rather low percentage of individuals finding information about goods and services on the Internet.

Men are more familiar with ICT than women. For instance, they use the Internet more frequently, though the gap has narrowed in this respect. The percentage of women in ICT education/training is low. Gender differences start early: for instance, boys are more likely than girls to have a computer provided for them at home.

A high level of education facilitates access to ICT. This applies to Internet use where differences by level of education are tending to increase.

The youngest population groups are most familiar with ICT. Consequently, the older the people, the more important the role of lifelong IT training.

ICT education and training should mean a marked increase in the number of specialists at the economy’s disposal in a few years.

ICT adoption, development 1997-2001

ICT expenditure, international comparison, 2002

ICT in enterprises
Switzerland is one of the OECD countries which spends most on ICT services per inhabitant. In 2002, Switzerland had 79 mobile phone subscribers per 100 inhabitants, which is among the highest in the world. Switzerland does not belong to the leading OECD countries. Since 2000, only the use of homepages has grown quite strongly, while the adoption of other ICTs has slowed down. Various reasons are responsible for this relative slowdown of different types of ICTs for different sectors.

Digital divide in the general public

Men are more familiar with ICT than women. For instance, they use the Internet more frequently, though the gap has narrowed in this respect. The percentage of women in ICT education/training is low. Gender differences start to appear early, boys are more likely than girls to have a computer provided for them at home. A high level of education facilitates access to ICT. This applies to Internet use where differences by level of education are tending to increase.

The younger population groups are most familiar with ICT. Consequently, the older the people, the more important the role of lifelong IT training.

ICT expenditure, international comparison, 1996-2002

In the OECD, Switzerland is the country which spends most per inhabitant on ICT, surpassing the United States and the Scandinavian countries. Swiss households spent in 2001 twice as much for ICT services as the OECD average. In 2001, telecommunication services (telephone, Internet services) were the major ICT expenditure category in Switzerland. The use of ICT goods, Swiss households invested in 2001 primarily in IT equipment. In 2001, ICT expenditure represented 3% of the household's total expenditure. The ISDN (Integrated Services Digital Network) penetration rate is among the highest in the world, growing from 69 000 subscribers in 1995 to 861 000 subscribers in 2001.

PCs, Internet and Intranet are being used in Switzerland more intensely in the service sector than in the industrial and construction sectors. The most intensive use of ICT takes place for modern services relying on e-commerce.

The intensity of Internet use has grown for all three sectors between 2000 and 2002, while Intranet use has declined for all three sectors during the same time period. The intensity of PC use has remained basically constant for the industrial and construction sectors while it has declined for the service sector. The use of other technologies, like digital assistants and digital watches, is restricted to special needs of business activities. Large enterprises use ICT more frequently than small enterprises. This holds especially for Internet, Intranet, and broadband technologies. Technological differences are also pronounced across sectors but not between industry and service providers.

_average percentage of employees in an enterprise using different types of ICTs for different sectors

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The intensity of Internet use has grown for all three sectors between 2000 and 2002, while Internet use has declined for all three sectors during the same time period. The intensity of PC use has remained basically constant for the industrial and construction sectors while it has declined for the service sector. Large enterprises use ICT more frequently than small enterprises. This holds especially for Internet, Intranet, and broadband technologies. Technological differences are also pronounced across sectors but not between industry and service providers.
With 79 mobile phone subscribers per 100 inhabitants in 2002, Switzerland does not belong to the leading OECD countries. Italy, Latin America and the Scandinavian countries have significantly higher subscription rates than Switzerland.

In 2002, Switzerland had one of the highest percentage of telephone main lines worldwide (73 lines per 100 inhabitants).

The increase in the number of students and apprentices in ICT education and training should mean a marked increase in the number of specialists at the economy’s disposal in a few years.

There have been extraordinary technical developments in communication and information devices in recent years. Switzerland has an excellent ICT infrastructure, but the technical potential is (still) under-used for electronic commerce.

Digital divide in the general public

Men are more familiar with ICT than women, for instance, they use the Internet more frequently, though the gap has narrowed in this respect. The percentage of women in ICT education/training is low. Gender differences start early. Boys are more likely than girls to have a computer provided for them at home.

A high level of education facilitates access to ICT. This applies to Internet use where differences by level of education are tending to increase.

The youngest population groups are most familiar with ICT. Consequently, the older the people, the more important the role of lifelong IT training.

With 74 hosts per 1000 inhabitants per month, Switzerland is far from the leader position. In 2001, Switzerland had 215 secure web servers per million inhabitants, which indicates, compared to the OECD average of 143 secure web servers per million inhabitants, Switzerland’s commitment to e-commerce.

According to the OECD, Switzerland had in 2001 the highest percentage of individuals using e-mail (90%) but a rather low percentage of individuals finding information about goods and services on the Internet.

ICT education and training should mean a marked increase in the number of specialists at the economy’s disposal in a few years.

The use of ICT in Switzerland, especially e-mail and the Internet, has strongly grown between 1997 and 2000. Since 2000, only the use of homepages has grown strongly, while the adoption of other ICTs has slowed down.

Various reasons are responsible for this relative slowdown of ICT adoption. Several ICTs, such as e-mail, Internet, PC and work stations are already being used by almost 100% of all Swiss households. When it comes to ICT goods, the households invested in 2001 primarily in IT equipment. In 2001, ICT expenditure represented 3% of the household’s total expenditure.

Large enterprises use ICT more frequently than small enterprises. This holds especially for Internet, Intranet, and broadband technologies. The opposite differences are more prevalent across sectors but not between industry and service providers.

In the OECD, Switzerland is the country which spends most per inhabitant on ICT, surpassing the United States and the Scandinavian countries.

Swiss households spent in 2001 twice as much as for ICT services as for ICT goods. In 2001 (telecommunication services limited to Internet services) were the major ICT expenditure category in Swiss households. When it comes to ICT goods, the household expenditure represented 3% of the household’s total expenditure.

ICT expenditure, development 1994-2003

ICT in enterprises

The use of ICT in Switzerland, especially e-mail and the Internet, has strongly grown between 1997 and 2000. Since 2000, only the use of homepages has grown strongly, while the adoption of other ICTs has slowed down. Various reasons are responsible for this relative slowdown of ICT adoption.

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Large enterprises use ICT more frequently than small enterprises. This holds especially for Internet, Intranet, and broadband technologies. The opposite differences are more prevalent across sectors but not between industry and service providers.

Industry

Construction

Services

Average percentage of employees in an enterprise using different types of ICTs for different sectors

Source: OECD, data on employees, 1999/2000 and 2002

Source: Employee panel survey 2002

Source: EITO 2003, SFSO

Source: ITU, BAKOM, own calculations

Source: KOF panel survey 2002

Source: KOF panel survey 2002

ICT = Information and Communication Technologies

ICT adoption, development 1994-2003

ICT expenditure, 2002

ICT in enterprises

ICT expenditure, 2002

ICT in enterprises

ICT adoption, 1994-2003

ICT expenditure, international comparison, development 1994-2003

ICT devices

Digital Divide in the General Public

ICT devices

Digital Divide in the General Public

ICT devices

Digital Divide in the General Public

ICT devices

Digital Divide in the General Public

ICT devices
**Brief review of the information society in Switzerland**

**Swiss economy’s ability to compete**
- On the basis of employment and foreign trade statistics, the OECD paints a contrasting picture of Switzerland in terms of information and communication technologies (ICT): the share of ICT employment in total business sector employment is rather high, but foreign trade in ICT is less important.
- The increase in the number of students and apprentices in ICT education and training should mean a marked increase in the number of specialists at the economy’s disposal in a few years.
- There have been extraordinary technical developments in communication and information devices in recent years.

**Digital divide in the general public**
- Men are more familiar with ICT than women, for instance, they use the Internet more frequently, though the gap has narrowed in this respect. The percentage of women in ICT education/training is low. Gender differences start to appear early: boys are more likely than girls to have a computer provided for them at home.
- A high level of education facilitates access to ICT. This applies to Internet use where differences by level of education are tending to increase.
- The youngest population groups are most familiar with ICT. Consequently, the older the people, the more important the role of lifelong IT training.

**Switzerland does not belong to the leading OECD countries**
- In 2002, Switzerland had one of the highest percentage of mobile phone main lines worldwide (73 lines per 100 inhabitants).
- The ISDN (Integrated Services Digital Network) penetration rate is among the highest in the world, growing from 6/10’000 subscribers in 1995 to 80/1’000 subscribers in 2001.
- In 1996, Switzerland had in 2001 the highest percentage of individuals using e-mail (90%) but a rather low percentage of individuals finding information about goods and services on the Internet.
- The use of ICT in Swiss enterprises, especially e-mail and the PC, workstations are already being used by almost 100% of all enterprises. The use of other technologies, like digital assistants or laptops, is restricted to specific kinds of business activities.

**Use of ICT in enterprises**
- There have been extraordinary technical developments in communication and information devices in recent years.
- In 2002, Switzerland had one of the highest percentage of mobile phone subscribers per 100 inhabitants in 2002.
- Switzerland has an excellent ICT infrastructure, but the technical potential is (still) under-used for electronic commerce.

**Telephony infrastructure**
- With 79 mobile phone subscribers per 100 inhabitants in 2002, Switzerland does not belong to the leading OECD countries. Italy, UK, Spain and the Scandinavian countries have higher subscription rates than Switzerland.
- In 2002, Switzerland had one of the highest percentage of telephone main lines worldwide (73 lines per 100 inhabitants).

**Internet infrastructure**
- In July 2001, Switzerland had 74 hosts (computers linked to the Internet and maintained by a third party side) per 1000 inhabitants (compared to 215 in July 1997). This infrastructure is more developed in the United States, the Canada and the Scandinavian countries in particular.
- The number of websites in Switzerland (20 websites per 1000 inhabitants in 2002) is below the OECD average. Switzerland has an excellent ICT infrastructure, but the technical potential is (still) under-used for electronic commerce.

**ICT expenditure**
- In the OECD, Switzerland is the country which spends most per inhabitant on ICT, surpassing the United States and the Scandinavian countries.
- Switzerland spent in 2001 twice as much for ICT services as for ICT goods. In 2001, communications services (broadband Internet service) were the major ICT expenditure category in Swiss households. When it comes to ICT goods, the household investments in 2001 primarily in IT equipment. In 2001, ICT expenditure represented 3% of the household total expenditure.

**ICT in enterprises**
- The use of ICT in Swiss enterprises, especially e-mail and the Internet, has been strongly grown between 1997 and 2000. Since 2000, only the use of homepages has grown strongly, while the adoption of other ICTs has slowed down.
- The intensity of Internet use has grown for all three sectors between 2000 and 2002, while Intranet use has declined for all three sectors during the same time period. The intensity of PC use has remained basically constant for the industrial and construction sectors while it has declined for the service sector.

**ICT adoption, development 1994-2003**
- The Yamane survey indicates, compared to the OECD average of 142 secure web servers per million inhabitants, Switzerland's commitment to e-commerce.
- According to the OECD, Switzerland had in 2001 the highest percentage of individuals using e-mail (90%) but a rather low percentage of individuals finding information about goods and services on the Internet.

**ICT education and training**
- ICT education and training should mean a marked increase in the number of specialists at the economy’s disposal in a few years.
- The youngest population groups are most familiar with ICT. Consequently, the older the people, the more important the role of lifelong IT training.
- The use of ICT in Switzerland is being used more intensely in the service sector than in the industrial and construction sectors. The most intensive use of ICTs is for modern services relying on e-commerce.

**P.O.S., Internet and Intranet are being used in Switzerland more intensely in the service sector than in the industrial and construction sectors. The most intensive use of ICTs is for modern services relying on e-commerce.**

**Enterprise use of ICT**
- The intensity of Internet use has grown for all three sectors between 2000 and 2002, while Internet use has declined for all three sectors during the same time period. The intensity of PC use has remained basically constant for the industrial and construction sectors while it has declined for the service sector.
- Large enterprises use ICT more frequently than small enterprises. This holds especially for Internet, E-mail, and broadband technologies. Competitive differences are also pronounced across sectors but not between industry and service providers.

**Digital divide**
- Men are more familiar with ICT than women, for instance, they use the Internet more frequently, though the gap has narrowed in this respect. The percentage of women in ICT education/training is low. Gender differences start to appear early: boys are more likely than girls to have a computer provided for them at home.
- A high level of education facilitates access to ICT. This applies to Internet use where differences by level of education are tending to increase.
- The youngest population groups are most familiar with ICT. Consequently, the older the people, the more important the role of lifelong IT training.

**ICT adoption, development 1994-2003**
- There have been extraordinary technical developments in communication and information devices in recent years.
- In 2002, Switzerland had one of the highest percentage of mobile phone subscribers per 100 inhabitants in 2002.
Switzerland's ability to compete

On the basis of employment and foreign trade statistics, the OECD paints a contrasting picture of Switzerland in terms of information and communication technologies (ICT): the share of ICT value added in total business sector employment is rather high, but foreign trade in ICT is less important.

In the OECD, Switzerland is the country which spends most per inhabitant on ICT, surpassing the United States and the Scandinavian countries. In July 2001, Switzerland had 74 hosts (computers linked to the Internet and maintained by a third party side) per 1000 inhabitants (compared to 21 in July 1997). This infrastructure is more developed in the United States, Canada and the Scandinavian countries in particular.

They have been extraordinary technical developments in communication and information devices in recent years. Switzerland has an excellent ICT infrastructure, but the technical potential is still under-used for electronic commerce.

Digital divide in the general public

Men are more familiar with ICT than women. For instance, they use the Internet more frequently, though the gap has narrowed in this respect. The percentage of women in ICT education/training is low. Gender differences start even when young, boys are more likely than girls to have a computer provided for them at home.

A high level of education facilitates access to ICT. This applies to Internet use where differences by level of education are tending to increase.

The younger population groups are most familiar with ICT. Consequently, the older the people, the more important the role of lifelong IT training.

ICT adoption, development 1994-2003

In the OECD, Switzerland is the country which spends most per inhabitant on ICT, surpassing the United States and the Scandinavian countries. Swiss households spent in 2001 twice as much for ICT services as for ICT goods. In 2001, telecommunications services (without Internet services) were the major ICT expenditure category in Switzerland. When it comes to ICT goods, the households invested in 2001 primarily in IT equipment. In 2001, ICT expenditure represented 3% of the household's total expenditure.

Switzerland does not belong to the leading OECD countries. Italy, the UK, Spain, and the Scandinavian countries have higher subscription rates than Switzerland.

In 2000, Switzerland had one of the highest percentage of telephone main lines worldwide (73 lines per 100 inhabitants). The OECD (International Telecommunication Union) penetration rate is among the highest in the world, growing from 69/000 subscribers in 1995 to 80/000 subscribers in 2001.

In the OECD, Serbia and Montenegro are the countries which spend most per inhabitant on ICT, surpassing the United States and the Scandinavian countries. Telephone main lines worldwide (73 lines per 100 inhabitants). The OECD (International Telecommunication Union) penetration rate is among the highest in the world, growing from 69/000 subscribers in 1995 to 80/000 subscribers in 2001.

The number of websites in Switzerland (20 websites per 1000 inhabitants) is below the OECD average. Switzerland had 215 secure web servers per million inhabitants, which indicates, compared to the OECD average of 142 secure web servers per million inhabitants, Switzerland's commitment to e-commerce.

According to the OECD, Switzerland did in 2001 the highest percentage of individuals using e-mail (90%) but a rather low percentage of individuals finding information about goods and services on the Internet.

In July 2001, Switzerland had 74 hosts (computers linked to the Internet and maintained by a third party side) per 1000 inhabitants (compared to 21 in July 1997). This infrastructure is more developed in the United States, Canada and the Scandinavian countries in particular.

Various reasons are responsible for this relative slowdown of ICT adoption. Several ICTs, such as e-mail, Internet, PC and work stations, are already being used by almost 100% of all enterprises. The use of other technologies, like digital assistants or laptops, is restricted to specific kinds of business activities.

Large enterprises use ICT more frequently than small enterprises. This holds especially for Internet, E-intrnet, and broadband services. Technological differences are also prominent across sectors but not between industry and service providers.

ICT expenditure, international comparison, 2002

Large enterprises (250 employees and more) and small enterprises (5–49 employees) have a higher intensity of ICT use than medium-sized enterprises (50–249 employees).

The use of ICT in Switzerland is strongly related to e-mail and the Internet, which has strongly grown between 1997 and 2000. Since 2000, only the use of homepages has grown strongly, while the adoption of other ICTs has slowed down.

Various reasons are responsible for this relative slowdown of ICT adoption. Several ICTs, such as e-mail, Internet, PC and work stations, are already being used by almost 100% of all enterprises. The use of other technologies, like digital assistants or laptops, is restricted to specific kinds of business activities.

ICT expenditure is particularly low in Switzerland and the Scandinavian countries. Large enterprises use ICT more frequently than small enterprises. This holds especially for Internet, E-intrnet, and broadband services. Technological differences are also prominent across sectors but not between industry and service providers.

POCs, Internet and Internette are being used more intensively in the service sector than in the industrial and the construction sector. The most intensive use of ICT is for modern services relying on e-commerce.

The intensity of Internet use has grown for all three sectors between 2000 and 2002, while Internet use has declined for all three sectors during the same time period. The intensity of ICT use has remained basically constant for the industrial and construction sectors while it has declined for the service sector.

Large enterprises (250 employees and more) and small enterprises (5–49 employees) have a higher intensity of ICT use than medium-sized enterprises (50–249 employees).

ICT adoption, development 1994-2003

The use of ICT in Switzerland, especially e-mail and the Internet, has strongly grown between 1997 and 2000. Since 2000, only the use of homepages has grown strongly, while the adoption of other ICTs has slowed down.

Various reasons are responsible for this relative slowdown of ICT adoption. Several ICTs, such as e-mail, Internet, PC and work stations, are already being used by almost 100% of all enterprises. The use of other technologies, like digital assistants or laptops, is restricted to specific kinds of business activities.

The intensity of ICT use has grown for all three sectors between 2000 and 2002, while Internet use has declined for all three sectors during the same time period. The intensity of ICT use has remained basically constant for the industrial and construction sectors while it has declined for the service sector.
Switzerland's ability to compete

- On the basis of employment and foreign trade statistics, the OECD paints a contrasting picture of Switzerland in terms of information and communication technologies (ICT): the share of ICT sector employment in total business sector employment is rather high, but foreign trade in ICT is less important.
- The rise in the number of students and professorships in ICT education and training should be marked increase in the number of specialities on the economy's diagnosis is a few years.
- There have been extraordinary technical developments in communication and information devices in recent years. Switzerland has an excellent ICT infrastructure, but the technical potential is (still) under-used for electronic commerce.

Digital divide in the general public

- When we compare more familiar with ICT that women, for instance, they use the Internet more frequently, though the gap has narrowed in this respect. The percentage of women in ICT education/training is low. Gender differences start to emerge: boys are more likely than girls to have a computer provided for them at home.
- A high level of education facilitates access to ICT. This applies to Internet use where differences by level of education are tending to increase.
- The young and the population groups are most familiar with ICT. Consequently, the older the people, the more important the role of lifelong IT training.

ICT expenditure

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ICT adoption, development 1994-2003

 ICT expenditure, international comparison, 2002

 ICT in enterprises

The use of ICT in Switzerland, especially e-mail and the Internet, has most strongly grown between 1997 and 2000. Since 2000, only the use of e-mail has grown strongly, while the adoption of other ICTs has slowed down. Various reasons are responsible for this relative slowdown of ICT adoption. Several ICTs, such as e-mail, Internet, PC and work stations are already being used by almost 100% of all enterprises. The use of other technologies, like digital assistants (PDAs), is restricted to special kinds of business activities.

Large enterprises use ICT more frequently than small enterprises. This holds especially for Internet, E-mail, and broadcast media. Two noticeable differences are also prevalent across sectors but not between industry and service providers.

P.O.'s, Internet and Internet are being used in Switzerland more intensively in the service sector than in the industrial and the construction sectors. The most intensive use of ICT is for modern services relying on e-commerce.

The intensity of Internet use has grown for all three sectors between 2000 and 2002, while Internet use has declined for all three sectors during the same time period. The intensity of P.C. use has remained basically constant for the industrial and construction sectors but it has declined for the service sector.

Large enterprises (250 employees and more) and small enterprises (5–49 employees) have a higher intensity of ICT use than medium-sized enterprises (50–249 employees).

 ICT = Information and Communication Technologies

 ICT goods = Information Technologies
The Swiss Federal Statistical Office (SFSO) is participating in the FIS research project SEAMATE, Socio-Economic Analysis and Macro-modelling of Adapting to Information Technologies in Europe. The objective of SEAMATE is to estimate, for the first time at a EU level, of the socio-economic impact of information and communications technologies (ICT) on the EU-15, Norway and Switzerland. The SFSO is involved in working package WP 6.1, statistical indicators and data needs. The focus of this WP is to develop a system view and indicators for ICT adoption that is relevant for policy makers.

The number of students and apprentices undergoing ICT education and training has grown dramatically since the mid-Nineties, and e-sales in Switzerland have steadily grown over the past three years. The leading sectors with respect to the transaction volume for e-sales are hotel and restaurant industry, retail trade and commerce, service for persons and wholesale. Obviously, there is no single sector that is leading in both e-procurement and e-sales.

Type of Education

<table>
<thead>
<tr>
<th>Type of Education</th>
<th>Percentage of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>HS</td>
<td>30%</td>
</tr>
<tr>
<td>UAS</td>
<td>25%</td>
</tr>
<tr>
<td>UNI</td>
<td>20%</td>
</tr>
<tr>
<td>PTS</td>
<td>15%</td>
</tr>
<tr>
<td>HTC</td>
<td>10%</td>
</tr>
<tr>
<td>HS = higher IT management schools</td>
<td></td>
</tr>
<tr>
<td>PTS = polytechnical schools</td>
<td></td>
</tr>
<tr>
<td>HTC = higher technical colleges</td>
<td></td>
</tr>
<tr>
<td>UAS = universities of applied sciences</td>
<td></td>
</tr>
<tr>
<td>UNI = universities</td>
<td></td>
</tr>
</tbody>
</table>

E-procurement is highest for the modern service sector and in the high-tech industry. The growth of e-procurement between 2000 and 2002 was stronger in the industry and construction sectors than in the service sector. Larger enterprises engage more often in e-procurement than smaller companies. However, medium-sized enterprises have caught up quite a bit with respect to large enterprises. E-sales are more prevalent in the industry service sector than in the construction sector. Obviously, Internet strategies seem to have been ignored in the medium-sized and large enterprises, even though the labor group has experienced a decline between 2000 and 2002.

ICT degrees in Switzerland for different types of education, development 1980–2001

E-procurement in 2002 was slightly higher after stagnating between 1990 and 1995.

Average percentage of purchases value and turnover

<table>
<thead>
<tr>
<th>Year</th>
<th>Average Percentage Value</th>
<th>Average Percentage Turnover</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>10%</td>
<td>5%</td>
</tr>
<tr>
<td>2001</td>
<td>12%</td>
<td>6%</td>
</tr>
<tr>
<td>2002</td>
<td>15%</td>
<td>8%</td>
</tr>
</tbody>
</table>

Based on this system view, the SFSO has adopted an inductive, hypothesis-driven approach to evaluate how ICT adoption can cause various impacts. Women are chronically underrepresented in ICT education and training, with only 3% of students choosing IT management schools, 4% polytechnical schools diplomas and 1% universities of applied sciences degrees.

The focus of ICT indicator definition has evolved over the years, shifting from technical indicators to high-level, strategic indicators that are more relevant for policy makers.

E-sales are more prevalent in the industry service sector than in the construction sector. Women represent a bigger percentage of students at higher IT management schools (16%) and at university level (25%). However, they obtain only a tiny share of awarded vocational certificates (5%), polytechnical school diplomas (5%) and universities of applied sciences diplomas (5%).

The Swiss Information Society policy focuses on expanding access to Internet services, strengthening the competitiveness of the Swiss economy, and highlighting the problem of the digital divide in the general population.

Information society indicators are developed in the framework of the Information Society Coordination Group (ISCG) set up by the Swiss Government in 1996. The project takes its lead from international initiatives on indicator development headed by the OECD and Eurostat. Information society indicators contribute to discussions about the threats and opportunities of the information society, making it possible to evaluate the Swiss economy’s ability to cope with these challenges and highlighting the problem of the digital divide in the general population.

Indicators for the information society in Switzerland

This brief provides some examples of indicators for the information society based on the Swiss Federal Statistical Office (SFSO). Information society indicators are regularly updated and expanded on the SFSO website.
Internet-based e-procurement in Switzerland is about twice as high as e-sales. Both types of e-commerce have not changed after stagnating between 1990 and 1995. Women are chronically underrepresented in ICT education and training, accounting for only 9% of the degrees awarded in Switzerland. Both the transaction volumes for Internet-based e-procurement and e-sales in Switzerland have steadily grown over the past three years. The leading sectors with respect to the transaction volume for e-procurement are manufacturing, watches, textiles and construction. The leading sectors with respect to the transaction volume for e-sales are hotel and restaurant industry, retail, personal services, wholesale and retail. Obviously, there is no single sector that is leading in both e-procurement and e-sales.

The two major benefits of e-procurement are a higher market transparency and an acceleration of business processes. The benefits of e-sales refer to image aspects, strengthening of customer base and access to new customer segments and the launching of new products. Cost aspects, other than reductions of marketing costs, are of minor consideration.

Both the transaction volumes for Internet-based e-procurement and e-sales have steadily grown over the past three years. The leading sectors with respect to the transaction volume for e-procurement are ICT-research, watches, textiles and construction. The leading sectors with respect to e-sales are hotels and restaurants industry, retail, personal services, wholesale and retail. Obviously, there is no single sector that is leading in both e-procurement and e-sales.

The focus of ICT indicator definition has evolved over the years, from readiness, to intensity, to impact, and finally to outcome. We differentiate between ICT-research, watches, textiles and construction. The leading sectors with respect to e-sales are hotel and restaurant industry, retail, personal services, wholesale and retail. Obviously, there is no single sector that is leading in both e-procurement and e-sales.

Based on this system view, the SFSO has adopted an inductive, hypotheses-driven approach to indicator development headed by the OECD and Eurostat. Different technologies have different saturation levels which, among other things, makes international comparisons possible.

Women represent a bigger percentage of students at university level than in high-tech industry. The growth of e-procurement between 2000 and 2002 was stronger in the industry and construction sector than in the service sector. Obviously, Internet strategies seem to have been reversed in the service sector due to the threats and opportunities of the information society, making it possible to evaluate the Swiss economy's ability to compete and highlighting the problem of the digital divide in the general public.

The Swiss Federal Statistical Office (SFSO) is participating in the FPR research project SEAMATE, Socio-Economic Analysis and Macro-modelling of Adapting to Information Technologies in Europe. The objective of SEAMATE is to estimate indicator values for the first time at a EU level, of the socio-economic impact of information and communication technologies (ICT) on the EU-15. The data is being collected through a ZIP-1, statistical indicators and data needs.

The focus of ICT indicator development is expected to remain on the year, from readiness, to intensity, to impact, and finally to outcome. We differentiate between ICT-research, watches, textiles and construction. The leading sectors with respect to e-sales are hotel and restaurant industry, retail, personal services, wholesale and retail. Obviously, there is no single sector that is leading in both e-procurement and e-sales.
Both the transaction volumes for Internet-based e-procurement and e-sales in Switzerland have steadily grown over the past three years. The leading sectors with respect to the transaction volume for e-procurement include ICT research, watches, retail, textile and construction. Obviously, no single sector that is leading in both e-procurement and e-sales as well as in e-sales there are more prevalent in the industry sector than in the service sector. The leading sectors with respect to the transaction volume for e-sales are hotel and restaurant industry, health care, insurance, services for firms and wholesale. Obviously, no single sector that is leading in both e-procurement and e-sales as well as in e-sales.

Women are chronically underrepresented in ICT education and training, accounting for only 9% of the degrees awarded in the high-tech industry. The growth of e-procurement between 2000 and 2002 was stronger in the industry and construction sector. Obviously, Internet strategies seem to have been reversed in the service sector due to the mature stage of the service sector and the increasing competition, in comparison to the industry sector. The business strategies seem to have been reversed in the service sector.

The number of students and apprentices undertaking ICT education and training has grown dramatically since the mid-Nineties, after stagnating between 1990 and 1995. Women are chronically underrepresented in ICT education and training, accounting for only 9% of the degrees awarded in the high-tech industry.

ICT is heavily interconnected and so are ICT decisions (interconnectivity). The market leading technology is not necessarily the best one. Different technologies have different saturation levels (path dependency). Positive experience with ICT motivates individuals and firms to adopt ICT. Positive results in one sector can benefit other sectors (spill-over effect). ICT is heavily interconnected and so are ICT decisions (interconnectivity). The market leading technology is not necessarily the best one. Different technologies have different saturation levels (path dependency).
E-commerce engagement

Both the transaction volumes for Internet-based e-procurement and e-sales in Switzerland have steadily grown over the past three years. The leading sectors with respect to the transaction volume for e-procurement are IT research, watches, retail, textile and construction. The leading sectors with respect to the transaction volume for e-sales are hotel and restaurant industry, clothing, department stores, petrol stations and wholesale. Obviously, there is no single sector that is leading in both e-procurement as well as in e-sales.

The two major benefits of e-procurement are a higher level of transparency and an acceleration of business processes. The benefits of e-sales refer to image aspects, strengthening of customer focus and access to new markets, especially access to large enterprises.

- The high-tech industry.
- The growth of e-procurement between 2000 and 2002 was stronger in the industry and construction sector than in the service sector.
- Larger enterprises engage more often in e-procurement than smaller companies. However, medium-sized enterprises have caught up quite a bit with respect to large enterprises.

E-sales are more prevalent in the industry sector than in the construction sector. Obviously, Internet strategies seem to have been reversed in the service sector due to...
The number of students and apprentices undergoing ICT education and training has grown dramatically since the mid-Nineties, after stagnation between 1990 and 1995.

Women are chronically underrepresented in ICT education and training, accounting for only 9% of the degrees awarded in higher IT management schools (16%) and at university level (21%). However, they obtain only a tiny share of awarded vocational certificates (5%), polytechnical school diplomas (3%) and universities of applied sciences diplomas (5%).

E-procurement is highest for the modern service sector and in the high-tech industry. The growth of e-procurement between 2000 and 2002 was stronger in the industry and construction sector than in the service sector. Larger enterprises engage more often in e-procurement than smaller companies. However, medium-sized enterprises have caught up quite a bit with respect to large enterprises.

E-sales are more prevalent in the industry sector than in the construction sector. Obviously, internet strategies were to have been inscribed in the strategies of the major operators, a phenomenon also appearing in the service sector. E-sales are more prevalent in medium-sized and large enterprises, especially in the latter group has experienced a decline between 2000 and 2002.

The two major benefits of e-procurement are a higher market transparency and an acceleration of business processes. The benefits of e-sales refer to image aspects, strengthening of customer base and access to new customer segments and the launching of new products. Cost aspects, other than reductions of marketing costs, are of minor consideration.

Based on this system view, the SFSO has adopted an inductive, hypothesis-driven approach to indicator development headed by the OECD and Eurostat.

The project takes its lead from international initiatives on indicator development headed by the OECD and Eurostat.

The Swiss Federal Statistical Office (SFSO) is participating in the FIS research project SEAMEE, Socio-Economic Analysis and Adaptation to Information Technologies in Europe. The objective of SEAMEE is to estimate, for the first time at a EU level, of the socio-economic impact of information and communications technologies (ICT) on the EU-15. Horizon 2003/2004.

The SFSO is involved in working package WP 4, statistical indicators and data needs. The focus of this indicator selection is to include a dynamic ICT system view, that puts the decision makers at the core of the model.

E-commerce transaction volume

Both the transaction volumes for Internet-based e-procurement and e-sales in Switzerland have steadily grown over the past three years. The leading sectors with respect to the transaction volume for e-procurement are ICT research, watches, retail, finance and construction. The leading sectors with respect to the transaction volume for e-sales are hotel and restaurant industry, retail, engineering service, finance, and wholesale. Obviously, there is no single sector that is leading in both e-procurement as well as e-sales.

Type of Education

<table>
<thead>
<tr>
<th>Type of Education</th>
<th>% of all enterprises</th>
<th>2000</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLVE = apprenticeships</td>
<td>40</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>TE = trade examination</td>
<td>60</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>PROF = professional or masters’ examination</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>HS = higher IT management schools</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>PTS = polytechnical schools</td>
<td>30</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>HTC = higher technical colleges</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>UAS = universities of applied sciences</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>UNI = universities</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Source: KOF panel survey 2002

ICT degrees in Switzerland for different types of education, development 1990-2001

SEAMEE Project

ICDE, 2003

Information society indicators are developed in the framework of the Information Society Coordination Group (ISCG) set up by the Swiss Government in 1996.

The project takes its lead from international initiatives on indicator development headed by the OECD and Eurostat. Information society indicators contribute to discussions about the threats and opportunities of the information society, making it possible to evaluate the Swiss economy’s ability to profit from ICT and highlighting the problem of the digital divide in the general public.

Indicators for the information society in Switzerland

Indicators for the information society describe the infrastructure, the production and the use of information and communication technologies (ICT) in the various area of society (households, enterprise, education/training etc.). The economic and social significance of ICT is growing in modern societies. The presentation of trends is based on a database that is continuously renewed. The indicators provided help in understanding the status of the information society in Switzerland.