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The Used of the Internet in Procurement: An Empirical Analysis

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The Use of the Internet in Procurement:
An Empirical Analysis.

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According to a recent survey, 16% of all Swiss companies use an e-commerce solution to sell their products [15]. On the other hand, most companies in Switzerland are unfamiliar with the use of the Internet for purchasing and procurement processes and especially for online buying. This paper discusses the new requirements for procurement and shows the new concepts and strategies that have recently been developed. The main focus is on the opportunities and benefits of new information and communication technologies, especially the Internet. Included in this study are the results of an empirical survey conducted in Switzerland in October 1999. The aim of the survey was to analyze to what extent the Internet is being used in procurement of Swiss companies with more than 100 employees. The results show that the take-up of the opportunities and benefits of the Internet is currently rather low and that most Swiss companies seem to be satisfied with the efficiency of their procurement processes.

I. INTRODUCTION

A. The use of the Internet in general

The Internet, and especially the World Wide Web, is an information and communication medium whose opportunities and benefits have been discussed in great depth in recent years. Studies have shown that the number of users is still increasing and that 85% of the Global 1000 companies regard the Internet as an investment priority for the next three years. In particular, the phenomenon of e-commerce - the electronic selling of products and services via the Internet - is expected to grow excessively in the next few years. It is predicted that the volume of e-commerce will top the $1 trillion mark by 2003. The primary driving force for this growth is the business-to-business sector, which accounts for about 75% of all sales over the Internet [5].

In Switzerland, 16% of all Swiss companies use an e-commerce solution to sell their products [15]. The revenue from e-commerce is estimated at one billion CHF per year in Switzerland [10].

A steadily increasing number of companies have realized not only that selling products over the Internet can be revolutionary, but also that substantial benefits can be generated by the reengineering of procurement through the use of the Internet. New trends such as bidding systems, auctions or electronic purchasing of C parts are set to change significantly the processes in procurement.

B. Definition of terms

In research and business, a wide variety of definitions exist for the different terms related to "buying" and "logistics". In order to ensure a better understanding of the following issues, it is necessary to provide exact definitions of the terms that are relevant for this paper [4,8,11,12] (see Fig. 1).
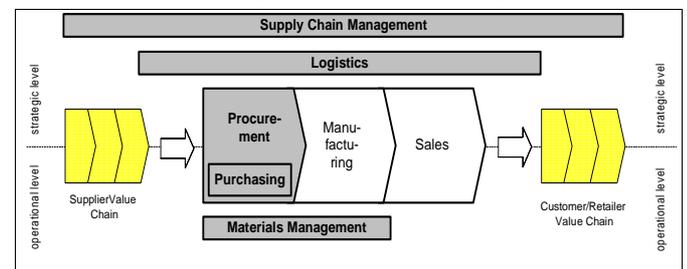

Fig. 1: Definition of terms.

Purchasing: This term describes the rather *operational* and administrative tasks that are carried out more or less by one department, namely the purchasing department. Usually, purchasing starts with needs identification and ends with the tracking of purchasing activities.

Procurement is defined as being broader in scope than "purchasing" and includes activities of *strategic* relevance, such as sourcing, negotiating with suppliers and coordination with R&D.

Sourcing is defined as finding and choosing the right suppliers for a product. It is a cross-functional process that involves – in addition to people from the purchasing department – members of the firm from engineering, manufacturing, marketing and other departments.

Supply Chain Management (SCM): SCM is the broadest term mentioned so far. It includes all of the above and is defined as the planning, steering and controlling of the whole flow of materials and services in a network of collaborating companies.

II. THE PROCUREMENT FUNCTION IN SWISS COMPANIES

A. Procurement as a Cinderella function

In most companies, procurement has always been a Cinderella function compared to other functions or departments. The main interest of the management has been focussed on the

manufacturing and sales departments. Procurement merely had to fulfil operational and implementation tasks [2,4,8,11].

Recently, more and more companies have realized that procurement plays a very important role in a company. In fact, procurement is more significant than sales in terms of its influence on company figures. This is illustrated by the following brief examples: firstly, it is obvious that a 5 mill. CHF reduction in procurement costs boosts the profit by exactly the same amount. Secondly, a case study at Mercedes Benz showed that a 10% increase in turnover had the same effect on the operating result as a reduction in material costs of 0.518% [2], due to the leverage effect of procurement costs.

A company must therefore be regarded as a complete, interfunctional organism; each department delivers an important contribution to success, which can only be achieved by the cooperation and collaboration of all departments [11].

B. Circumstances and problems

Most companies reported changes in the environment and circumstances in recent years, which have had major implications for internal and external processes [2,4,8,9]. We shall provide an overview of the main changes and attempt to derive a certain number of hypotheses for each group, which will be tested in chapter III/B for the three groups of users we developed in our research (see Fig. 5).

1) Globalization and cost pressure
It is not only the appearance of new information and communication technologies, but also the entry to the market of low-price competitors from countries in Eastern Europe or the Far East, which has turned globalization into a key issue for all companies. Suppliers, competitors and customers are becoming increasingly international. Competition is therefore becoming more intensive and is increasing cost pressure, which has an influence on the procurement function as well.

Hypothesis 1: Internet Users and Online Buyers judge (a) the state of competition as being more aggressive and (b) the stability of the environment as being lower, than Non-Users do.

2) Reduction in manufacturing depth
It is common knowledge that most companies concentrate on their core competencies [13]. They are advised to focus on producing the goods and services in which they excel. Concepts such as "lean company" and "lean production" are highly topical today. As a result of this focus on core competencies, fewer materials and goods are manufactured by the factory itself and outsourcing becomes an important issue [2,4,13]. The number of products acquired from suppliers is increasing and responsibility is delegated to the suppliers. Therefore, the costs for materials rise while the added value to a product becomes smaller. As a consequence of this, relationships with suppliers become more significant. It is important to choose the right supplies because these have a major influence on the quality of the final product [2,4,18].

3) Inefficient processes and dominance of non-strategic materials
Most companies purchase a wide variety of different products and services: MRO (Maintenance, Repair and Operations) products often account for the largest part. These products are the most relevant to a business process redesign because they include the major proportion of all products purchased, they integrate personnel resources, and they involve many different suppliers - even though they are usually of inferior value [7,14]. The ABC analysis describes these products as C parts and the term "low-impact, high-volume products" is used for these materials. The internal costs for the purchase of such inferior goods are often higher than the effective product value. Not only do inferior goods account for the majority of all purchased products, but there is a significant problem in that these C parts are purchased in the same manner as strategically important and highly relevant production goods such as raw materials and semi-finished products. There often is no difference in the way A/B and C parts are purchased [6,14].

A typical process is considered to be inefficient for the following reasons [6,7,14]:
- Time-intensity and complexity: purchasing a standard item involves several departments and hierarchical levels.
- Deficient IT support: The mainly manual process is not supported by modern technologies such as the Internet. In addition, different IT platforms between customers and suppliers complicate the exchange of data.
- Centralization: the central purchasing department is responsible for all orders. Strategic tasks such as sourcing and negotiating with suppliers therefore cannot be performed efficiently.

Other trends such as mergers and acquisitions, the intensification of vertical collaborations with partners, stagnating markets and more exacting customers are placing new demands on companies. Procurement activities have rarely been efficient so far [1,6,7,9,14]. The next chapter proposes ideas on possible strategies for meeting the demands of a *new* procurement function.

C. New concepts in procurement

1) Starting points for redesigning procurement processes
In order to adapt to the new circumstances and requirements, researchers and practitioners in the field of procurement have developed new concepts for optimizing processes and performance:
- *New sourcing strategies*: Terms such as "Global Sourcing", "Modular Sourcing" and "System Sourcing" describe new strategies for procurement. They are reactions to the ongoing globalization and liberalization of international trade. As a result of the decrease in manufacturing depth, more and more companies are buying semi-finished parts as modules and systems from suppliers all over the world. For a detailed discussion of these sour-

cing strategies see [3]. A survey conducted by the Aberdeen Group found that American companies usually spend 3.3 to 4.2 months on locating suitable suppliers. In 70% of all companies, sourcing is carried out with the help of printed catalogs and CD-ROMs [1]. These tools have many disadvantages (e.g. shortfalls in terms of comparability and updating). The Internet offers many possibilities in order to establish more efficient sourcing.

– *Restructuring the process:* Unnecessary controls must be eliminated and the competencies of users must be increased (empowerment). This leads to a further decentralization. In many decentralized companies, a central purchasing department is responsible for orders above a certain value while inferior orders are delegated to local departments and often directly to the user [6,7].

> Hypothesis 2: A correlation exists between the degree of decentralization of procurement processes and the use of the Internet.

– *Integration between customer and supplier:* As a result of the decrease in manufacturing depth and the increase in material intensity, the relationships between supplier and customer must be strengthened; this focus on selected suppliers would generally lead to a reduction in suppliers. Supply chain management becomes essential. It is advisable for the procurement executives and the suppliers to be included in the process as early as the research and development (R&D) stage, so that their experiences may be brought to bear on the product [18].

> Hypothesis 3: Internet Users and Online Buyers describe their relationships with suppliers as being more intensive than Non-Users do.
> Hypothesis 4: Internet Users and Online Buyers integrate their suppliers more strongly in R&D than Non-Users do.
> Hypothesis 5: Internet Users and Online Buyers have more suppliers from abroad than Non-Users.
> Hypothesis 6: Internet Users and Online Buyers have fewer suppliers than Non-Users.

– *Further support and automation through IT:* Modern IT offers many possibilities for restructuring and redesigning processes that have hitherto been carried out manually and on paper. Internet technologies in particular promise substantial benefits (e.g. standardized exchange of data) combined with low investment costs. The potential benefits are described in the next chapter.

> Hypothesis 7: Internet Users and Online Buyers judge their procurement processes as being more efficient and automated to a higher degree than Non-Users do.

– *Differentiation of products and procurement processes.* In an initial phase, purchasing of C parts should be modified. Typical objects for a redefined process are: computer hardware and software, office supplies/stationery, tools, printed material, magazines and books, and services such as travel, training courses, and banking services.

> Hypothesis 8: The procurement processes of Internet Users and Online Buyers are – in contrast to Non-Users – different for A/B and C parts.

2) Opportunities presented by Internet and Internet-based software products
This paragraph focuses on the possibilities of the Internet and other Internet- or Intranet-based software products (e.g. Netscape BuyerXPert, SAP BBP etc.) which can help to optimize the 5 steps of a typical procurement process [8,9]:

Activity	Support through Internet
Need identification	▪ Rather low
Search and Identification of Suppliers (Sourcing)	▪ Online research on the WWW ▪ Reversed marketing ▪ Knowledge management ▪ Use of software agents ▪ Requests for proposals ▪ Auctions
Selection of product and supplier Transmission of order	▪ Electronic catalogs on the Internet/Intranet (sell-side, buy-side, electronic marketplaces, see Fig. 3) ▪ Availability checking (online) ▪ Workflow for approval for a request ▪ Placing order via Web browser, especially for purchase of C parts ▪ Placing order via Web EDI
Order processing Transport	▪ Control of the order status ▪ Tracking
Delivery Goods received Booking Stocking	▪ Desktop receiving ▪ Electronic management of complaints ▪ Electronic payment (e.g. purchasing cards) ▪ Statistics, supplier assessment

Fig. 2: Support options of the Internet

As Fig. 2 shows, the Internet offers many possibilities for supporting the different activities involved in a procurement process. In particular, the online purchasing of C parts (Electronic Purchasing) shows major potential. A company basically has three possible options to do Electronic Purchasing [6,17]. The company may install a customized standard software (*buy-side solution*), which includes a certain number of catalogs from various suppliers. These catalogs are installed on the Intranet and every user can order products via a Web browser and the Intranet. Buy-side solutions usually include workflows for approval if a request exceeds a certain order limit and are integrated with the company's ERP system, so that all order data can be processed internally. On the other hand, a company may order directly on the websites of different suppliers (*sell-side solution*). Integration with an ERP system on the customer side is not generally possible. The third possibility is the use of e*lectronic marketplaces,* where several suppliers and customers come together. The marketplace is usually hosted and maintained by a third-party com-

pany. Again, the problem of ERP integration is not usually solved. The following figure (Fig. 3) provides an overview of the three different ways of using the Internet for Electronic Purchasing.
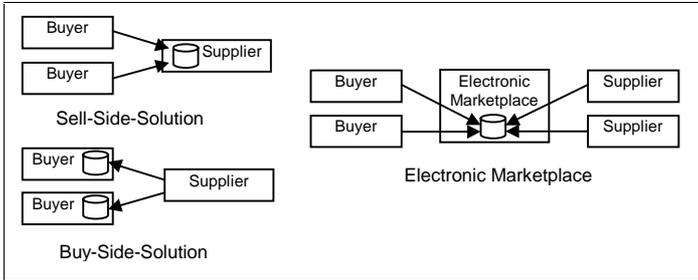

Fig. 3: Three ways of using electronic catalogs

For a comparison of the advantages and disadvantages of these three solutions, see [7,17]. In order to obtain substantial benefits, only buy-side solutions (and, to a lesser extent, electronic marketplaces) offer the possibility of redesigning the procurement process. Certain people within the company can be allocated a budget and are able to order products, especially C parts, via a Web browser; this leads to an elimination of unnecessary checks. Fig. 4 provides an overview of how a new process might appear [7,14].
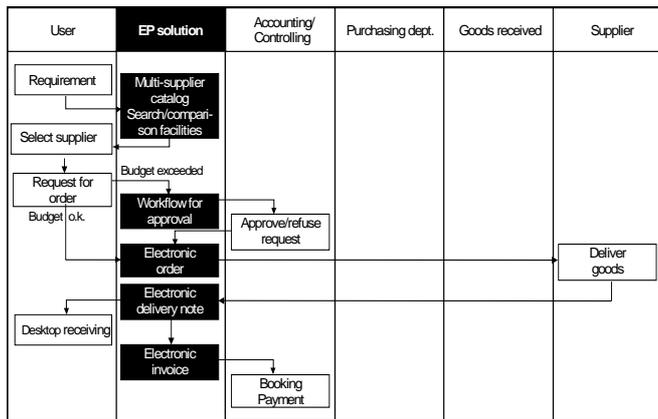

Fig. 4: New process after implementation of a buy-side solution

The application of a buy-side-solution can lead to substantial improvement and savings both for the buying as well as for the selling enterprise. The automation of processes usually results in a reduction in repetitive tasks and in the need for controls. IBM was able to reduce transaction costs by over 50%, erroneous orders by 25% and the number of C part suppliers by 90% [7].

On the qualitative side, procurement executives are relieved of operational and administrative tasks, the transparency of the process is increased, and the relationships with suppliers are intensified [14].

III. INTERNET USE IN PROCUREMENT IN SWISS COMPANIES

A. Results of a survey

In order to obtain data about the use of the Internet for procurement purposes in Switzerland, an empirical study was conducted among 900 Swiss companies with between 100 and 499 employees in October 1999. These companies, which were selected using a randomized stratified sample, received a written questionnaire containing 19 questions about the organization and the internal processes of procurement, the use of technology, the purchasing of products online and relationships with suppliers. The response rate was 19.9%.
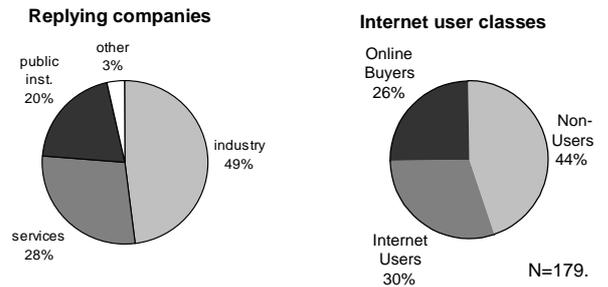

Fig. 5: Responding companies

As Fig. 5 shows, 44% of the responding companies do not use the Internet in procurement. On the other hand, 56% of the companies use the Internet, but only 26% buy products and materials online. There are significant differences in Internet use between companies in the industry, service and public institutions sectors. The latter uses the Internet less intensively than the industry or services sector and has a significantly lower ratio of purchasing volume to turnover (mean: 34.7%; industry: 41%, public institutions: 12%).

We were able to deduce that 49.8% of all orders have a value of less than 2,000 CHF (~1,250 USD). The average number of orders per year is 5,672.
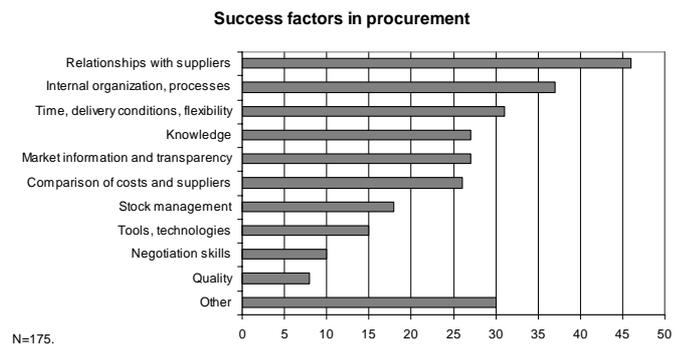

Fig. 6: Success factors in procurement

Regarding the success factors in procurement from the viewpoint of procurement managers (see Fig. 6), the greatest importance is attached to relationships with suppliers, followed by management of internal processes and organization. This confirms our indications in chapters II/B and C. It is interesting to note that tools and technologies are ranked only 8th.

Today's problems in procurement

Cost pressure
Dependence on suppliers
Stock management
Too many operative tasks
Insufficient comparability
Exchange of data
Inefficient processes
Deficient transparency and controllability
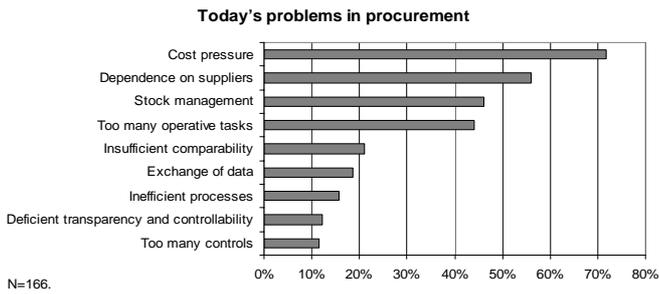Too many controls

0% 10% 20% 30% 40% 50% 60% 70% 80%

N=166.

Fig. 7: Today's problems in procurement

Swiss companies consider cost pressure to be the biggest problem in procurement today (72%, see Fig. 7). Further problems are caused by dependence on suppliers, stock management, as well as the high number of operational tasks.

In chapter II/B we pointed out that different purchasing processes should be used for A/B and C parts. We also said that decentralization offers the benefit of relieving managers of operational tasks.

Differences in purchasing A/B and C parts

No 32.8%
Yes 67.2%

Decentralized Purchasing

0% 10% 20% 30% 40% 50% 60%

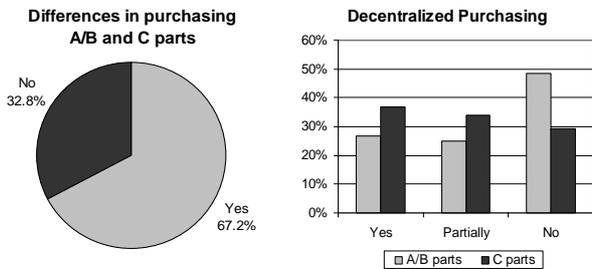Yes   Partially   No

A/B parts   C parts

Fig. 8: The purchasing of A/B and C parts
(left: N=144, right: N=153)

Two thirds of the companies state that their purchasing processes for A/B parts and C parts differ. On the right of Fig. 8, it can be seen that C parts are more often purchased locally, i.e. by people outside the procurement department. In roughly 50% of the companies, A/B parts are purchased solely by the central purchasing department. Furthermore, our research showed that C parts involve significantly more suppliers (median: 80) than A/B parts (median: 48).

Internal costs of an order

0% 10% 20% 30% 40% 50%

< 50 CHF   50-99 CHF   100-149 CHF   150-199 CHF   > 200 CHF

A/B parts   C parts

Internal processing time of an order

0% 10% 20% 30% 40% 50%

< 1 h   1-4 h   4-8 h   8-16 h   16-32 h   > 32 h
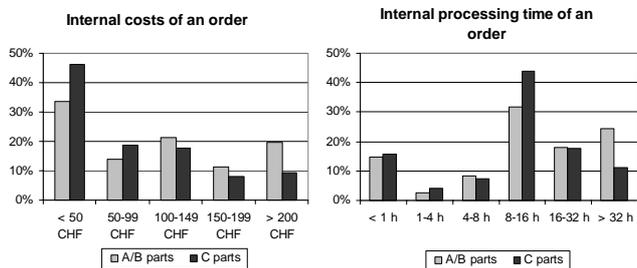
A/B parts   C parts

Fig. 9: Internal cost and processing time
(A/B parts: N=77, C parts: N=71).

Fig. 9 provides further proof of the difference in purchasing processes for A/B and C parts. The purchasing of A/B parts incurs higher costs (mean: 221.55 CHF; median: 100.00 CHF) than the purchasing of C parts (mean: 80.26 CHF, median: 60.00 CHF). With regard to processing time, the greater num-

ber of replies for the two classes fell in the 8-16 hours category. However, the means return a value of 29.7 hours for A/B parts and 14.9 hours for C parts.

Automation of purchasing processes

0% 10% 20% 30% 40% 50% 60% 70%

not automated   partially automated   highly automated

A/B parts   C parts

Efficiency of purchasing processes

0% 10% 20% 30% 40% 50% 60% 70%

not efficient   partially efficient   efficient
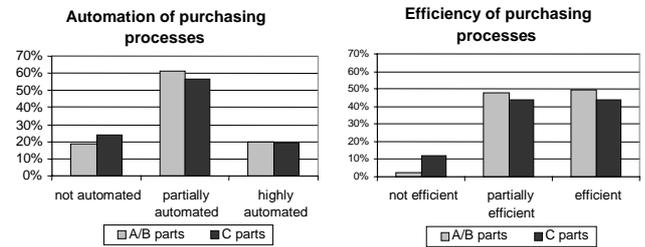
A/B parts   C parts

Fig. 10: Automation and efficiency of processes
(A/B parts: N=159, C parts: N=151)

Fig. 10 shows that Swiss companies are rather satisfied with their procurement processes; processes are considered to be rather efficient and automated. Only for the purchasing of C-parts do 12% of companies state that their processes are not efficient. The purchasing of A/B parts is highly efficient according to Swiss procurement managers. Fig. 10 also shows that there are no significant differences between the purchasing processes for A/B and C parts.

Use of technologies

Phone
Fax
EDI
E-mail
WWW, FTP
Intranet/Extranet
Internet-based purchasing software
In-house solution

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

N=175.

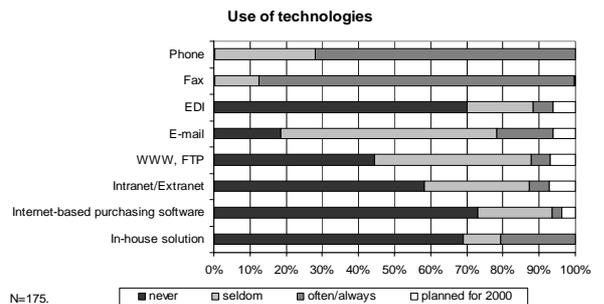never   seldom   often/always   planned for 2000

Fig. 11: The use of technologies to support procurement

With regard to the use of technologies to support procurement processes, phone and fax are still the most frequently used (see Fig. 11). It seems that E-mail is also becoming established in procurement; about 78% of all companies use E-mail, mainly in order to communicate with their suppliers. Internet services such as WWW and FTP are used by 56% of Swiss companies. On the other hand, EDI, Internet-based purchasing software, and in-house solutions are scarcely utilized.

Importance of the Internet in Procurement

0% 10% 20% 30% 40% 50% 60%

low   rather low   medium   rather high   high

N=172.
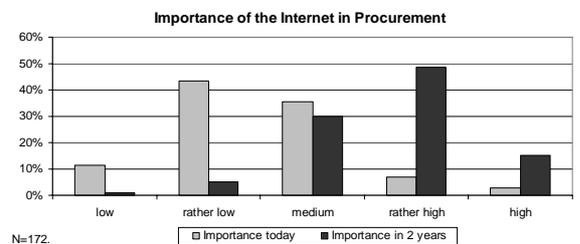
Importance today   Importance in 2 years

Fig. 12: Importance of the Internet in Procurement

Swiss companies seem to be becoming aware of the potential and the benefits of the Internet, as Fig. 12 shows. With regard to the assessments for 1999, the procurement managers con-

sider the Internet as being of rather low or medium importance. However, 60% think that the importance of the Internet will become rather high or high in 2 years.

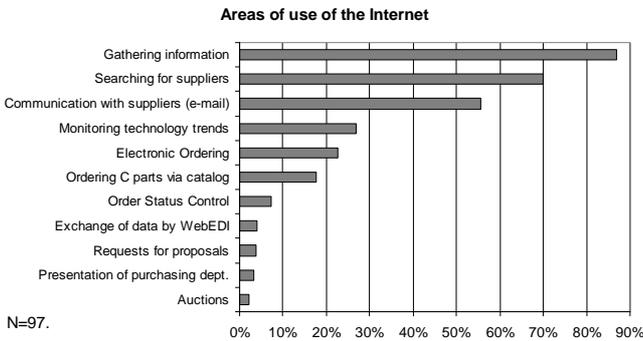**Areas of use of the Internet**

N=97.

Fig. 13: Areas of use of the Internet

As Fig. 13 shows, the Internet is mainly used as a medium for information and communication purposes. It is highly popular for the gathering of information about products, suppliers and technology trends. There is currently little awareness of the possibilities for purchasing C parts via Web browser, requests for proposals, or auctions on the Internet.
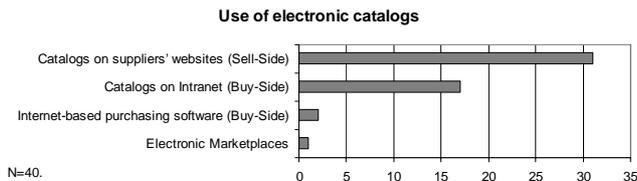
Use of electronic catalogs

N=40.

Fig. 14: Ways of using electronic catalogs

Most companies started online buying in 1998. However, Fig. 14 shows that companies buy mainly on the websites of selected suppliers (sell-side). This means that there is hardly any integration of procurement solutions with ERP systems; only 12.8% have implemented such an interface.

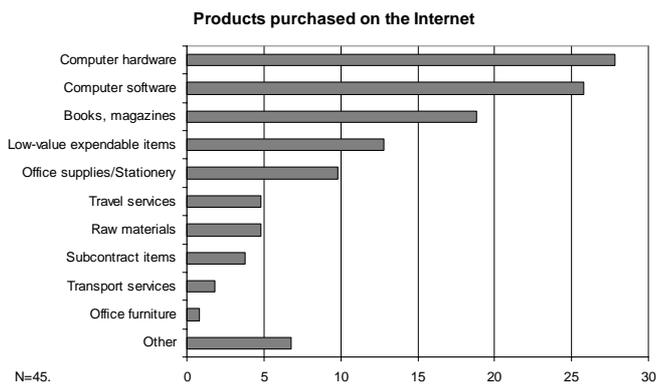**Products purchased on the Internet**

N=45.

Fig. 15: Products purchased online

It is obvious that not all kinds of products are equally suitable for ordering via the Internet. Fig. 15 indicates that mainly computer products and office supplies are bought online; these are typical MRO products. Only a few companies buy strategically relevant production supplies over the Internet.

With the arrival of more electronic marketplaces (such as the already existing www.chemdex.com for the chemical industry, or www.metalsite.com for the acquisition of metal products), this number is expected to increase in the near future.

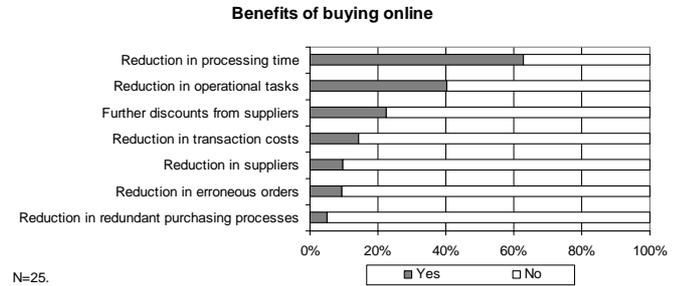**Benefits of buying online**

N=25.

Fig. 16: Benefits of buying online

As mentioned in the theoretical issues in chapter II/C, innovative international companies have been able to experience significant process modifications and quantitative savings. In Swiss companies, the main benefit of buying online seems to be the reduction in the internal processing time, followed by the freeing of procurement managers from non-strategic tasks (see Fig. 16). Only 16% of the companies that buy products online were able to reduce their transaction costs; a possible explanation for this may be that most companies did not start buying online until 1998 or even 1999 and that it takes some time for the new processes to become fully developed and for quantitative benefits to be noticed. In addition, most companies have not implemented an interface to their ERP system so that the benefits may not become sufficiently apparent.

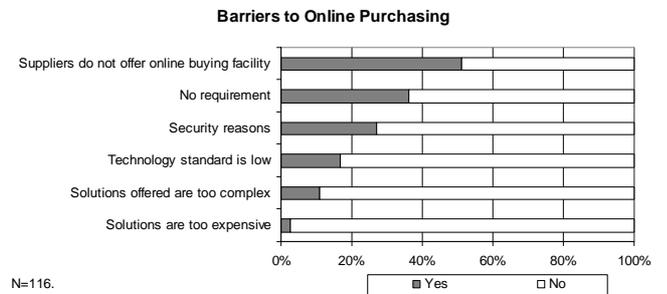**Barriers to Online Purchasing**

N=116.

Fig. 17: Barriers to Online Purchasing

It is interesting to observe that the price does not seem to be an important factor when considering the reengineering of procurement processes. The main problem is that suppliers do not offer facilities for buying online. Fig. 17 confirms the expectation of the authors about Swiss companies being rather satisfied with the efficiency of their processes. 38% of all companies indicated that there is no requirement to implement an online buying solution. Furthermore, security reasons still seem to be of a certain importance to Swiss companies.

Our survey provided interesting results about suppliers and their relationships with purchasing enterprises. The research showed that the number of suppliers has decreased since 1997 from an average of 568 to 462 in 1999 (see Fig. 18).
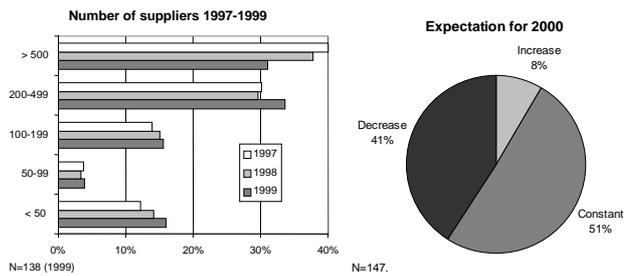
Fig. 18: Number of Suppliers

When asked about the trend for the year 2000, only 8% of the companies expect an increase in the number of suppliers. 51% believe that the number of suppliers will remain constant and 41% plan a further reduction of suppliers. 35% of procurement managers stated that the Internet has an influence on this trend. Furthermore, 60% of Swiss companies indicated that they regularly involve their suppliers in the research and development process for new products. However, only 18% of the companies believe that the Internet leads to stronger relationships with suppliers.

B. Tests of significance

In this section we shall attempt to derive some possible differences between the user groups that we have developed. Generally, there are only a few discrepancies between Non-Users, Internet Users and Online Buyers.

The tests were performed in a standardized way; to detect differences between the user groups (e.g. Internet Users v. Non-Users), we used cross-tabulations and chi-square tests. The latter indicates whether differences are significant or not. The Cramér's V measurement indicates the intensity of interdependence and Gamma the direction (positive/negative). For the sake of clarity, these figures are not listed in the following paragraph. To test the hypotheses derived from the theoretical approaches, tests were performed as explained above. Table 1 summarizes all tests of the hypotheses 1 to 8.

Hypothesis		Sign.	Accept / Refuse
1a:	more aggressive competition	No	Refuse
1b:	lower stability of the environment	No	Refuse
2:	degree of decentralization	**Yes**	**Accept**
3:	intensive relationship to suppliers	No	Refuse
4:	integration of suppliers in R&D	No	Refuse
5:	more suppliers from abroad	No	Refuse
6:	fewer suppliers (absolute)	**Yes**	**Accept**
7a:	more efficient procurement process	No	Refuse
7b:	higher automated process	No	Refuse
8:	different process A/B and C parts	No	Refuse

Table 1: Testing of hypotheses.

As it can be seen in Table 1, it was possible for two significant findings to be developed: a) there are differences in the number of suppliers (see Table 2) and b) there is a difference

in the degree of decentralization of the procurement process: Non-Users purchase A/B parts on a decentralized basis to a greater extent than Online Buyers and Internet Users do. This finding is rather surprising. All other hypotheses had to be rejected after testing.

Furthermore, we intended to test whether larger companies showed different peculiarities than smaller companies. The four following attributes of size were tested for significance.

Attribute	Groups	Significance (Chi-squared)
Number of Employees	All groups equal	No
Revenue (absolute)	Internet Users and Non-Users equal to Online Buyers	Yes Chi 15.304 5 df
Number of Suppliers	Internet Users and Online Buyers equal to Non-Users	Yes Chi 14.633 4 df
Purchasing Volume (absolute)	Internet Users and Online Buyers equal to Non-Users	Yes Chi 10.242 4 df

Table 2: Tests for attributes of size

Table 2 shows that size does influence the use of the Internet in procurement; however, the results appear contradictory:
- the greater the revenue, the lower the utilization rate.
- the greater the number of suppliers, the higher the utilization rate
- the higher the purchasing volume, the higher the utilization rate

These findings do not allow any conclusion in the sense that larger companies do indeed use the Internet more intensively or vice versa.

In the questionnaire, the companies were asked their views on the importance of the Internet. From these findings, we were able to extract some significant differences: At present, Online Buyers assess the Internet as being more important (statistically significant). This statement is of little relevance because Online Buyers probably think that they are doing the right thing. More interesting is the question of how important the Internet will be in the future (see Fig. 19).
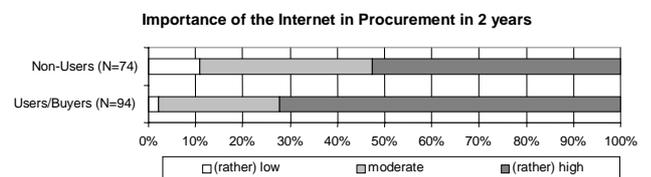

Fig. 19: Importance of the Internet in 2 years

It can be seen that Non-Users do not rate the importance of the Internet in procurement as highly as Internet Users and Online Buyers do (statistically significant). This is interesting in terms of awareness. Non-Users do not seem to be aware of the changes that the Internet may initiate in the future. We can therefore state that there is a group of companies that does not

foresee any changes in the future with regard to the technology used in procurement.

In a final step, we shall attempt to characterize the companies that use the Internet for online buying. The testing by cross-tabulation and chi-square analysis shows that Online Buyers

- have a higher purchasing volume and more suppliers.
- believe more strongly than Non-Users and Internet Users that the Internet will become more important in 2 years.
- operate on a more decentralized basis in procurement.
- have on average more low-value orders.

IV. CONCLUSION

Companies all over the world are encountering changes in their environment and in the conditions for operating on the market. It is obvious that the procurement function also must adapt to these new requirements and contribute to a successful method for doing business.

One option for responding to the new demands is to make more intensive use of the Internet. The Internet offers many facilities for supporting procurement processes.

Our research shows that Swiss companies have little awareness of the potential offered by the Internet. The Internet is mainly used as a medium of information and communication. The buying of goods online (so-called "direct purchasing") is rather unfamiliar to Swiss procurement managers. Unfortunately, the results of our research cannot significantly prove that Online Buyers and Internet Users show a more efficient or more automated procurement process than Non-Users. The main reason for this might be that only sell-side solutions are implemented and that the solutions have only been used for a short period. However, from the companies that do use the Internet to buy online, it can be seen that there are quantitative and qualitative potentials, especially in the reduction of processing time for an order. In order to sensitize Swiss companies to the further improvement of their processes, additional research has to be conducted in this field.

REFERENCES

[1] ABERDEEN GROUP, WIZNet: Putting the *Business* in Business-to-Business E-Commerce, Boston 1999.
[2] ARNOLD, U., Beschaffungsmanagement, Stuttgart 1997.
[3] ARNOLD, U., Global Sourcing, in: Hahn, D., Kaufmann, L., Handbuch Industrielles Beschaffungsmanagement, pp. 215-229, Wiesbaden 1999.
[4] BOUTELLIER, R., LOCKER, A., Beschaffungslogistik, München 1998.
[5] COLEMAN, D. and SCHILLER, G., Dataconferencing, Distributed Project Management, Collaborative e-Commerce and Other Interactive Trends, in: Sieber, P., Griese, J., Organizational Virtualness and Electronic Commerce, Proceedings of the 2nd International VoNet-Workshop, pp. 43-52, September 23-24, Bern 1999.
[6] DOLMETSCH, R., Desktop Purchasing, St. Gallen 1999.
[7] EYHOLZER, K., Electronic Purchasing, IWI-Arbeitsbericht Nr. 116, Bern 1999.
[8] EYHOLZER, K., HUNZIKER, D., Internet-Einsatz in der Beschaffung, IWI-Arbeitsbericht Nr. 118, Bern 1999.
[9] HAMM, V., BRENNER, W., Purchasing is Recognized as a Business Key-Function, Freiberg 1997.
[10] HOCHSTRASSER, M., SIEBER, P., Ergebnisse der E-Commerce Umfrage 1998, IWI-Arbeitsbericht Nr. 112, Bern 1999.
[11] KARSCH, A., Supply Management im divisionalisierten Konzern, in: Hahn, D., Kaufmann, L., Handbuch Industrielles Beschaffungsmanagement, pp. 687-705, Wiesbaden 1999.
[12] KAUFMANN, L., Purchasing and Supply Management – A Conceptual Framework, in Hahn, D., Kaufmann, L., Handbuch Industrielles Beschaffungsmanagement, pp. 3-32, Wiesbaden 1999.
[13] PICOT, A., REICHWALD; R., WIGAND, R., Die grenzenlose Unternehmung, Wiesbaden 1996.
[14] SCHÄFFER, H., HÖLL, S., SCHÖNBERG, T., Buy-Direct – Eine Intranet-basierende Geschäftsprozessoptimierung im Einkauf, in: Scheer, A. W., Nüttgens, M. (Hrsg.), Electronic Business Engineering, pp. 505-519, Heidelberg 1999.
[15] SETTELE, C., Das Jahrtausend des E-Commerce, in: CASH, Sondernummer orbit, Zürich 1999.
[16] SIEBER, P., HUNZIKER, D., Einsatz und Nutzung des Internet in kleinen und mittleren Unternehmen in der Schweiz 1999, IWI-Arbeitsbericht Nr. 115, Bern 1999.
[17] TPN REGISTER, Content Management. Key to the Success of Internet Procurement for Non-Production Supplies, Rockville.
[18] WOLTERS, P., Forward Sourcing – Entwicklungsbegleitende Lieferantenauswahl, in: Hahn, D., Kaufmann, L., Handbuch Industrielles Beschaffungsmanagement, pp. 253-264, Wiesbaden 1999.