



# Internet Adoption Barriers for Small Firms in The Netherlands

RITA WALCZUCH, *University of Maastricht*

GERT VAN BRAVEN, *University of Maastricht*

HENRIETTE LUNDGREN, *University of Maastricht*

Small firms are not adopting the Internet with the same speed their larger counterparts do, although it could offer many advantages to them. This study explores several factors that influence small businesses in their choice of Internet use (e.g. benefits and barriers). The main barriers to Internet adoption and to developing a Web presence are simply the concern that the Internet or the Website would not lead to more efficiency or lower costs. However, the benefits that Dutch small firms are deriving from their Websites can be described as 'border-crossing'. These results seem to confirm the 'international' image of Dutch businesses. © 2000 Elsevier Science Ltd. All rights reserved

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## Introduction

Small firms are not adopting the Internet with the same speed their larger counterparts do (Computerworld, 1998). This despite the fact that the Internet can offer a great deal of advantages to small firms. The Internet provides 24 hour visibility around the world. Internet technology can be the basis for an intranet, or even an extranet. These network opportunities used to be far too expensive for small firms. Only large firms could afford such applications. Kalakota and Whinston (1996, p. 135) also conclude that 'as restrictions are dismantled, commercial use of the Internet is becoming more common. This is especially good for small businesses.'

Small firms are vital in our economy, very often recognized as an economy growth engine (Brouthers *et al.*, 1998). They often occupy strategic positions in

the economy, positions for which large companies lack the flexibility. In exploiting these opportunities, small firms often provide society with new products. Secondly, they provide a large part of total employment (38.5 per cent) (Economisch Instituut voor het Midden- en Kleinbedrijf, 1997).

It is therefore important that the new information society will be embraced by the smaller firms as well. The Internet will eventually have an impact on their productivity, market access, and competitiveness.

This paper focuses on the use of the Internet by small firms, and more specifically small firms in The Netherlands. The central research question is:

What are the benefits of and barriers to Internet use experienced by small firms in The Netherlands?

Answering this question should lead to some useful insights on the position of Dutch small businesses in the era of electronic commerce. The paper will focus on four issues of the Internet: benefits and uses of the Internet, form and content of Websites, and barriers obstructing Internet use.

A questionnaire, sent to about a thousand firms, was used as the method to answer these questions. This paper will first review current research on the issue and develop hypotheses, briefly describe the methodology used, give a summary of the results, and finally discuss the results.

## Small Firms and the Internet

### Benefits of Internet Use by Small Firms

In three empirical studies the benefits of the Internet for small firms are described (Abell and Limm, 1996;

Poon and Strom, 1997; Poon and Swatman, 1997). The findings are listed in Table 1 structured along the components of business value of the framework of Bloch *et al.* (1996).

However, not all of these benefits are perceived by small firms as being equally important. Poon and Strom (Poon and Swatman, 1997) indicate that direct and indirect advertising, low cost communication, and easy access to potential customers are most important. The benefits considered least important are competitor's performance benchmarking, inter-office documents exchange, and access to government and trade organisation data. Their main conclusion is that the savings and/or direct earnings small firms derive from the Internet are marginal.

Interestingly, Abell and Limm's study (Abell and Limm, 1996) found that small firms claim more benefits from Internet than larger ones. Effectiveness in information gathering, and availability of expertise — regardless of location — are claimed to be most important. These benefits are achieved by using the Web as a communication and information medium, which is the most common Internet use of small firms. (Poon and Strom, 1997; Poon and Swatman, 1997) come to a very similar conclusion. Their empirical results show that the largest benefits for small firms are speedy and timely access to information on Websites, as well as communication efficiency improvement.

The classification of direct and indirect benefits can be found in all three studies (see Table 1 below). Direct benefits (e.g. lower costs for supply acquisition) are relatively easy to quantify (Poon and Swatman, 1997). Indirect benefits, on the other hand (e.g. improved company image), are harder to measure and have more effect in the long run. An Internet Website clearly offers some potential costs saving and/or revenue enhancing capabilities. Research however has shown that savings or earnings directly from the Internet are marginal (Abell and Limm, 1996; Poon and Strom, 1997; Poon and Swatman, 1997). One may expect the same outcome for Dutch small businesses.

H<sub>1</sub>: Small firms in The Netherlands obtain only indirect benefits from an Internet Website now or within a year.

### Internet Uses

Hitherto, two small-scale studies have been undertaken, which investigated the ways small companies use the Internet (Abell and Limm, 1996; Poon and Strom, 1997). These studies show that the Internet is mostly used as a communications medium. E-mail is the dominant use in the *content* and *context* period of the electronic market place evolution (Block and Guptill, 1997). According to this timetable, most enterprises are in the *context* period right now. Poon and Strom (1997, p.4) state that for their sample of

**Table 1 Internet Benefits for Small Firms**

Component	Benefit	Source
Product promotion	Direct and indirect advertising	Poon and Strom (1997)
New sales channel	Easy access to potential customers	Poon and Strom (1997)
	On-line sales and transactions	Poon and Strom (1997)
	Ability to reach out to international markets	Abell and Limm (1996)
	Increase in market share of products/services	Abell and Limm (1996)
Direct savings	Low cost communication	Poon and Strom (1997)
	Savings in communication costs	Poon and Swatman (1997)
	Savings in advertising costs	Poon and Swatman (1997)
	Increased productivity	Abell and Limm (1996)
	Lower cost margins for products/services	Abell and Limm (1996)
	Lower cost of obtaining supplies	Abell and Limm (1996)
Time to market	Product delivery	Poon and Strom (1997)
Customer service	Greater customer satisfaction	Abell and Limm (1996)
Brand image	Company image enhancement	Poon and Strom (1997)
	Create an up-to-date corporate image	Poon and Swatman (1997)
	Obtain know-how through discussion with others on the Internet	Poon and Swatman (1997)
Technological and organisational learning		
Customer relations	Form and extend business networks	Poon and Swatman (1997)
New business models	Competitor's performance benchmarking	Poon and Strom (1997)
	Create new business opportunities	Poon and Swatman (1997)
	Speedy and timely access to information from Websites	Poon and Swatman (1997)
	Communication efficiency improvement	Poon and Swatman (1997)
	Effectiveness in information gathering	Abell and Limm (1996)
	Availability of expertise regardless of location	Abell and Limm (1996)
	Better service and support from suppliers	Abell and Limm (1996)

firms 'the ability to communicate, particularly with international customers or business partners without necessarily being worried about their whereabouts was convenient'. The major communication application of the Internet for small firms is E-mail. One might therefore expect the same popularity of E-mail for Dutch small firms.

H<sub>2</sub>: The most popular way of using the Internet for small firms in The Netherlands is E-mail.

### Websites

Clearly, some types of Websites are more sophisticated than others (for a classification of Websites see Hoffman *et al.* (1996). A large on-line storefront is much more advanced than a flat-ad Internet presence, which consists of general information and an E-mail address. The on-line storefront offers far more applications: the site can be searched, products can be ordered, and orders can be paid electronically.

It has been suggested in the popular press that a successful Website can only be constructed by a professional agency (E/Merce, 1998). Such an agency has the ability to fit the Website to the customer needs. It is claimed that a so-called 'amateur' (student on internship or an acquaintance) or even the organisation itself lacks the knowledge of tailoring a Website that uniquely reaches the target market. Professional agencies are able to implement a great variety of Internet applications, which clearly distinguishes them from non-professionals (E/Merce, 1998). This leads to the following hypothesis:

H<sub>3</sub>: Websites developed by professional agencies offer more applications than Websites *not* developed by professional agencies.

Zwaas (1996) structured electronic commerce into three categories: consumer-oriented commerce, business-to-business commerce, and intra-organisational business. The largest of these three categories is busi-

ness-to-business electronic commerce (Timmers, 1998, p. 3). This prediction is supported by market research, which shows that the share of business-to-business commerce will rise from 66 to 79 per cent in the period 1998–2002 (Automatiseringsgids, 1998). A Website does not have to be entirely oriented to one of these three segments. However, since the business-to-business segment is the largest segment of electronic commerce, one may expect the largest part of all Websites to be business-to-business oriented.

H<sub>4</sub>: The largest part of all Websites of small firms in The Netherlands is business-to-business oriented.

### Barriers

There are two interesting market research studies focusing on barriers for small businesses (Abell and Limm, 1996; Purao and Campbell, 1998, #61). Both found issues that deter small companies from gaining Internet access. The latter conducted an exploratory research study. They held interviews with several small business owners, of which some were already on-line, and some were not. According to their study, primary barriers appear to be 'start up costs, unfamiliarity with the web and lack of guidance about how to start the process' (Purao and Campbell, 1998, p. 327). In contrast, the primary concern for firms that already are on-line is security hazards.

Abell and Limm (1996) researched firms already using the Internet. They also came to the conclusion that 'fruitful use is being hampered by concerns over security' (Abell and Limm, 1996, p. 8). They divided the security aspect in multiple distinct barriers of which 'guarantee of message delivery' proved to be the most important issue. Table 2 shows the barriers identified in these studies along the framework of Booz-Allen & Hamilton (1997).

Whereas the upper part of Table 2 shows barriers to companies without Internet access (researched by

**Table 2 Internet Barriers for Small Firms**

Category	Barrier	Source
Awareness of SMEs/access to infrastructure	Costs (start-up costs)	Purao and Campbell (1998)
	Unfamiliarity with the internet	Purao and Campbell (1998)
	Lack of guidance about how to start the process	Purao and Campbell (1998)
Critical mass among business partners Confidence in legal and regulatory framework/security	Suppliers or customers are not on-line	Abell and Limm (1996)
	Security hazards	Purao and Campbell (1998)
	Guarantee of message delivery	Abell and Limm (1996)
	Tampering with network messages	Abell and Limm (1996)
	Unauthorised access to internal networks	Abell and Limm (1996)
	Interception of network messages	Abell and Limm (1996)
	Verification of authorship of messages	Abell and Limm (1996)
	Enforceability of contracts negotiated over the network	Abell and Limm (1996)
Adaptation of business processes	Decreased productivity through frivolous use	Abell and Limm (1996)

Purao and Campbell, 1998), the lower part indicates significant issues for those that are already on-line (researched by (Abell and Limm, 1996). Barriers concerning the adaptation of business processes were hardly expressed by both of the studies. This indicates that small firms use electronic commerce on an experimental level, and difficulties with process adaptation are not yet a concern. A distinction between small companies with and without Internet access is therefore of use.

Research for attitude towards Internet has been poorly developed. There are experts who have already pointed out the necessity of conducting more research on behavioural aspects (Sanders, 1998a). Since attitude towards Internet might be an important factor concerning non-adoption, it will also be investigated.

#### *Reasons for Not Having Internet Access*

Surprisingly, little research has been done on the topic of Internet non-adoption. Since a great proportion of small businesses do not have access to the Internet, this issue is obviously important. Internet non-adoption was touched upon in market surveys done by IBM and Andersen Consulting. Both concluded that the high telecommunication costs amount to a significant barrier for electronic trade (Automatiseringsgids, 1998). It should however be noted that electronic trade is a step further than simply having Internet access. A report of the Dutch government (National Electronic Highway Action Plan), also indicates the purchase of computer equipment as a cost barrier for small- and medium-sized enterprises (Computable, 1998). Booz-Allen & Hamilton (1997, p.7) add that the slow rate of adoption of new technologies by small- and medium sized enterprises (SMEs) in Europe is closely linked to the 'high investments necessary (relatively speaking for SMEs).' One might argue whether Internet adoption is such a large investment or not, it seems that the 'new' or 'extra' costs involved appear to be the primary obstacle. This leads to the hypothesis:

H<sub>5</sub>: The most important reason for small firms in The Netherlands for not having Internet access is the high cost.

#### *Attitude Towards the Internet*

As mentioned before, attitudes towards the Internet could be a critical point of non-adoption. Research on this topic has however been poorly developed. Brouthers *et al.* (1998, p.136) conducted a survey on strategic decision-making of managers in small Dutch firms. They found out that 'small firm managers tended to choose strategies based on their personal desires and backgrounds, as opposed to selecting the best-fit strategy based on rational analysis.' Internet adoption can be regarded as a strategic decision. Since intuition and personal opinions play such a big role in small firm strategic decision-making, it might be expected that small firms without Internet access tend to have a negative image of the

Internet. Having a positive image would thus lead to Internet adoption.

H<sub>6</sub>: Small firms in The Netherlands without Internet access have a negative image of the Internet.

#### *Reasons for Not Having an Own Website*

The step between having Internet access and creating an own Website seems to be rather small. Market research reports have however indicated that Internet access does not automatically mean a company Website (Centraal Bureau voor de Statistiek, 1998). Apparently, significant barriers obstruct the development of a web presence. Purao and Campbell (1998, p.3) found that 'the primary deterrents for small businesses in establishing a web presence appear to be start up costs, unfamiliarity with the web and lack of guidance about how to start the process.' However, the firms considered in that study did not have Internet access. Deterrents like 'unfamiliarity with the web' and 'lack of guidance about how to start the process' will probably be of less importance for firms already having Internet access. A more plausible obstacle obstructing the step from Internet access to an own Website therefore remains; the costs involvement. Constructing and maintaining an own Website may be regarded as being too expensive.

H<sub>7</sub>: The most important reason for small firms in The Netherlands with Internet access for not having their own Website are the high costs.

#### *Concerns Surrounding Internet Use*

Security remains a critical issue surrounding the Internet. It could lead to hesitation over full Internet use or even total avoidance. This attitude may result from a bad Internet security image brought to life in many frightening stories published in the media. Technology development has recently been advanced as the standard of SET shows. However, old and new research still confirms that security is the largest concern surrounding the Internet (Abell and Limm, 1996; Purao and Campbell, 1998; Zwaas, 1996). There are many aspects with regard to security, and it seems interesting therefore to investigate the most important aspects. For example, a manager may fear both unauthorised access to internal networks and the interception of messages by third parties. Another study indicated that the guarantee of message delivery was the main concern of the companies surveyed (Abell and Limm, 1996). Given the evident use of the Internet as a communication medium by small firms (Poon and Strom, 1997), it seems logical that small firms are quite concerned with this aspect.

H<sub>8</sub>: Guarantee of message delivery is the largest concern for small firms in The Netherlands.

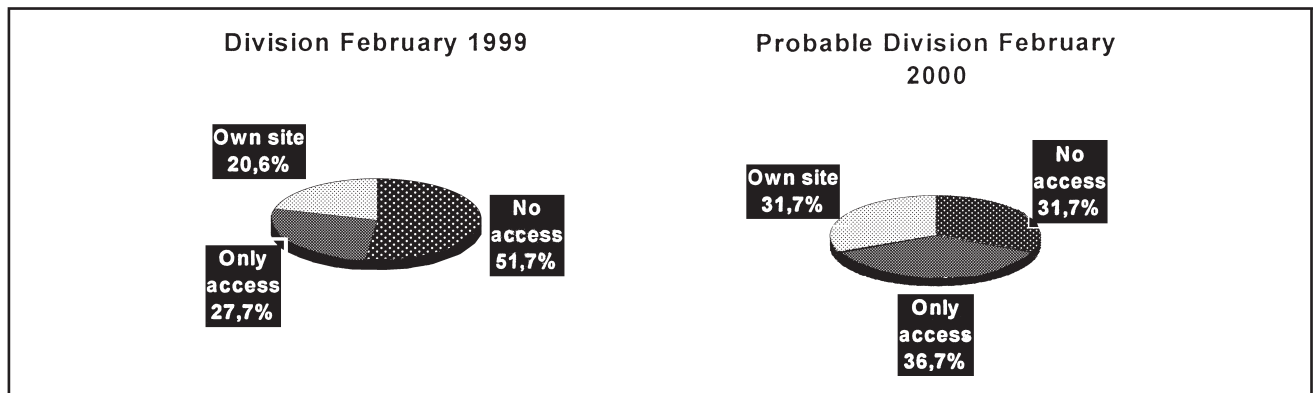


Figure 1 Division of Internet use February 1999 and February 2000

## Methodology and Results

### Methodology

This market research was carried out through a mail survey of small businesses in The Netherlands. A small business is, according to the criteria of the European Community, a firm with a maximum of 50 employees (Buhalis, 1996). The minimum of at least one employee was also chosen in order to exclude some organisational forms (e.g. holdings) that would not be suitable for the purposes of this study. No restriction based on type of industry was made. Each company in the sample was sent a four-page questionnaire, along with a postage-paid reply envelope and a covering letter. The questionnaire was written in Dutch and is available from the authors on request.

The study, which was conducted in February/March 1999, randomly selected 944 names of small businesses. The names were selected from a database of all 650,000 small businesses kept at the Dutch Chamber of Commerce. Eliminating responses of firms with more than 50 employees and incorrect addresses amounted to a response rate of 16 per cent. The questionnaire was developed mainly based on primary literature.

### Results

#### *Characteristics of the Sample*

The results show that 48 per cent of the companies have access to the Internet. Of the businesses that have no Internet access yet, 38 per cent claim to gain access within a year. If those companies keep their promise, 68 per cent of Dutch small businesses will have Internet access at the beginning of 2000. Forty-three per cent of the companies that already have Internet access also have their own Website. This means that 21 per cent of Dutch small firms have their own Website. Twenty-one per cent of companies without a Website say that they want one within a year. The division in February 1999 and the probable division in February 2000 are shown in Figure 1 above.

A summary of the demographic profile of the responding firms is presented in Table 3.

H<sub>1</sub>: Small businesses in The Netherlands obtain only indirect benefits from an Internet Website at the time of the study or within a year.

To test this hypothesis, respondents had to indicate on a five point Likert-scale their perceived benefits of 15 possible advantages from their own Website at the time of the study and their expected benefits for

Table 3 Sample Characteristics

	N	Average
Turnover (guilders)	62	f. 1,471,489
Number of employees	128	6.4
Company age (yr)	135	16.8
Percentage of revenue through export (%)	108	11.2
Percentage of purchases through import (%)	106	12.7
Percentage of sales over Internet (%)	100	0.3
Percentage of purchases over Internet (%)	101	0.8
Degree to which ICT-activities are out-sourced	124	1.54
Months of Internet access	65	19.3
Degree to which Website is integrated within company processes	28	1.39

Likert-scale ranging from 'no outsourcing' (1) to 'total outsourcing' (5)

Likert-scale ranging from 'no integration' (1) to 'total integration' (5)

the next year. Of these 15 benefits, three are so-called 'direct' benefits ('lower costs acquiring supplies', 'increased productivity', and 'increased sales'). The Likert-scale ranges from 'no advantage'(1) to 'very large advantage'(5). A variable with a mean significantly larger than three is regarded a benefit. One sample *t*-test is used to investigate if one or more of the 'direct' benefits have a mean significantly different from three.

All of the three possible direct benefits, 'lower costs acquiring supplies', 'increased productivity', and 'increased sales', have means smaller than three for the recent year of the study and can therefore not be described as benefits now. One possible direct benefit, 'increased sales', has a mean significantly higher than three for one year later and can therefore be described as a direct benefit for the next year. This leads to the rejection of hypothesis 1.

Perceived benefits in the year of the research are, in order of importance, 'distance related barriers disappear', and 'improvement in company image' (Table 4). Possible benefits concerning suppliers as 'lower costs acquiring supplies', 'faster and/or more flexible delivery suppliers', and 'better support and service by suppliers' are not of significant advantage to small firms at the time of the survey or within a year. The benefits that show the highest growth potential are 'better information on your customers', 'improvement in company image', and 'increased customer satisfaction', i.e. all related to the relationship with customers.

H<sub>2</sub>: The most popular way of using the Internet for small firms in The Netherlands is E-mail.

In order to test hypothesis 2, respondents with a Website or only Internet access had to indicate in

which ways they are using the Internet. The most popular way of using the Internet is the application with the highest usage factor. Sixty-eight respondents completed this question.

Table 5 shows the breakdown of uses of the Internet for small companies. Respondents (firms with access and with own Website) were asked in what way they were using the Internet and in what way they would probably be using the Internet next year. Ninety-one per cent of all companies use the Internet for external communication via E-mail. Thus hypothesis 2 is supported. In contrast, only 25 per cent of the companies indicated the use of the Internet for internal communication. The Internet is also being used by more than three quarters of the firms to search for Webpage addresses and to randomly look for information.

Offering information to customers, sending purchase orders to suppliers, and receiving orders from customers are the major areas for growth over the next year (respectively 18, 17, and 16 percentage points growth). Using the Internet for voice/video conferencing and placing job vacancies, which are hardly used at the moment, also show high growth potential.

A number of benefits that Dutch small firms are deriving, or will derive within a year, from their Website can be described as 'border-crossing' (disappearance of distance related barriers now, continuous advertising all around the world next year). These results seem to confirm the 'international' image of Dutch businesses, highly aware of the small size of the local market and always searching for potential business opportunities abroad. Another study found that almost one-fourth of Dutch small business is *aggressively* pursuing new markets or new

**Table 4 Perceived Benefits. One Sample *t*-test, Test Value = 3<sup>a</sup>**

Perceived benefits	N	Now		Within a year	
		Mean	SD	Mean	SD
Distance related barriers disappear	25	3.52**	1.19	3.46	1.35
Improvement in company image	27	3.41*	1.19	3.96***	0.72
Continuous advertising all around the world	25	3.32	1.35	3.59*	1.38
Increased sales	26	3.31	1.26	3.54*	1.32
Effectiveness in collecting information	25	3.24	1.42	3.57**	1.12
More customer service	25	3.20	1.35	3.31	1.29
Increased customer satisfaction	26	3.08	1.39	3.64***	1.00
Possibility of reaching international markets	26	3.04	1.46	3.17	1.40
Better consciousness 'business environment'	24	2.92	1.53	2.62	1.47
Availability of knowledge regardless location	24	2.92	1.47	2.64	1.47
Better information on your customers	24	2.13***	1.39	2.83	1.55
Increased productivity	24	1.96***	1.40	2.00**	1.34
Better support and service by suppliers	23	1.57***	0.95	1.55***	1.06
Faster and/or more flexible delivery suppliers	23	1.43***	0.79	1.50***	1.06
Lower costs acquiring supplies	23	1.30***	0.64	1.41***	1.01

<sup>a</sup> \*\*\**P* < 0.01, \*\**P* < 0.05, \**P* < 0.10

**Table 5 Ways of Using the Internet**

	Usage percentage (%)	Probable usage next year (%)	Percentage points growth
1. External communication (E-mail)	91	94	03
2. Searching for Web page addresses	79	81	02
3. Randomly looking for information	76	81	05
4. Obtaining information from suppliers	57	68	11
5. Offering information to consumers	32	50	18
6. Contact with governmental agencies	28	39	11
7. Internal communication	25	28	03
8. R&D and sharing of information and software	19	22	03
9. To be seen at the forefront of modern technology	18	25	07
10. Sending purchase orders to suppliers	18	34	16
11. Product and market research	18	26	08
12. Receiving orders from customers	12	29	17
13. Voice/video conferencing	01	09	08
14. Placing job vacancies	00	10	10

**Table 6 Applications on Website/Possibilities of Using Website**

	Percentage of companies (%)
E-mail address	97
To provide rational information	90
To promote company and/or products	86
To order	31
Customer service	21
To search for suppliers	10
To pay	07
Built-in security	07
To offer job vacancies	03
Information for personnel (intranet)	00
Extranet	00

products (Brouthers *et al.*, 1998). It seems that the Internet is one of the tools in this quest.

H<sub>3</sub>: Websites developed by professional agencies offer more applications than Websites not developed by professional agencies.

Hypothesis 3 was tested through two questions. The first one asked the respondents for the different applications/possibilities on their Website (e.g. possibility to pay electronically, customer service, E-mail address). Secondly, the respondents were asked to

indicate the builder of the Website (own organisation, acquaintance or student on internship, or professional agency). Averages of total number of applications were then calculated for both Websites that were built by professional agencies and Websites *not* built by professional agencies. A paired sample *t*-test was conducted to search for a statistically significant difference. Twenty-nine respondents completed this question.

Table 6 shows the breakdown of different applications/possibilities of the responding firms' Websites. Almost all Websites have an E-mail address and provide rational and promotional information. A rather high percentage of all sites (31 per cent) offer the possibility to order electronically. The option of paying electronically is only possible on 7 per cent of the Websites. The sites provide customer service in 21 per cent of all cases. None of the sites is part of an intranet or extranet.

Table 7 shows the breakdown of the builders of the Websites. It can be seen that in most cases the Website is made by the own organisation (46.4 per cent). Professional agencies account for 32.1 per cent of the Websites, and the remaining 21.4 per cent were built by so-called 'amateurs' (acquaintance or student on internship).

Furthermore, Table 7 contains information about the average number of applications on Websites. The

**Table 7 Builders Website**

Builders Website	N	Percentage of companies (%)	Average number of applications
Own organisation	13	46.4	3.31
'Amateur' (acquaintance or student on internship)	6	21.4	3.50
Professional agency	9	32.1	4.00

**Table 8 Division of Website**

	Mean	SD	Range
Percentage site consumer-oriented	47.41	42.44	100.00
Percentage site 'business-to-business'-oriented	50.86	41.45	100.00
Percentage site oriented at own organisation	1.72	9.28	50.00

professionally designed Web pages have on average four applications. Websites, *not* made by a professional agency (made by the own organisation, student on internship or acquaintance) have on average 3.37 applications. Further analysis through an independent-samples *t*-test however reveals that these averages are not significantly different ( $P = 0.148$ ). It can therefore not be stated that Websites developed by professional agencies offer more applications than Websites *not* developed by professional agencies. Thus, there is not enough evidence to support hypothesis 3.

H<sub>4</sub>: The largest part of all Websites of small firms in The Netherlands is business-to-business oriented.

Respondents were asked for the relative proportions of their Website oriented towards the consumer, 'business-to-business', or the own organisation. The results were used to test hypothesis 4. It was then tested whether some proportions are significantly larger than others. Twenty-nine respondents (all respondents with own Website) completed this question.

Table 8 shows the division of Dutch small firm's Websites. The average percentages for consumer orientation and 'business-to-business' do not differ significantly ( $P = 0.825$ ) nor is the percentage 'business-to-business' significantly larger than 50 per cent ( $P = 0.912$ ). Therefore, hypothesis 4 can be rejected. It should be noted that the 1.72 per cent of 'orientation towards own organisation' came from one respon-

dent claiming 50 per cent orientation on this part. Interestingly, the analysis reveals high standard deviations. That suggests that in many cases a Website might be completely consumer-oriented or 'business-to-business'-oriented. This relationship is confirmed by almost perfect negative correlation ( $-0.976$ ,  $P < 0.01$ ).

H<sub>5</sub>: The most important reason, for small firms in The Netherlands, for not having Internet access are the high costs.

Hypothesis 5 was tested with a question that gave respondents several possible reasons for not having Internet access. A five-point Likert scale was used to assess the degree to which a respondent (firm without Internet access) agreed or disagreed with each statement. The Likert-scale ranged from 'totally disagree' (1) to 'totally agree' (5). Statistical significance was calculated to see whether a statement had a mean significantly larger than three. These statements could then be described as real barriers obstructing Internet access. A second question asked whether respondents planned to gain Internet access within a year. The results were used to divide the sample into two groups, as can be seen in Table 9.

Different reasons for not having Internet access were formulated, of which two concerned the costs involved: 'too expensive with regard to computer equipment' and 'too expensive with regard to telecommunication costs.' As can be see in Table 9, neither have the highest mean, nor were they signifi-

**Table 9 Reasons for not Having Internet Access. One Sample *t*-test, Test Value = 3<sup>a</sup>**

Variable	N	Whole sample		Firms with Internet access within a year		Firms with no Internet access within a year	
		Mean	SD	Mean	SD	Mean	SD
Lack of time	61	3.64**	1.38	3.30	1.17	3.84***	1.51
Does not lead to more efficiency or lower costs	56	3.63**	1.46	2.80	1.44	4.29***	1.10
Too expensive with regard to telecommunication costs	55	3.20	1.45	3.00	1.44	3.38	1.45
Technically too complicated	55	2.93	1.49	2.44*	1.42	3.28	1.44
Too expensive with regard to computer equipment	54	2.91	1.35	2.46*	1.35	3.27	1.26
Insecure	50	2.58**	1.43	2.75	1.42	2.42*	1.45
Too slow when using	49	2.45***	1.37	2.65	1.40	2.27**	1.34
Possible use for unintended purposes by personnel	50	2.24***	1.45	2.25**	1.42	2.23**	1.50

\*\*\* $P < 0.01$ , \*\* $P < 0.05$ , \* $P < 0.10$



cantly different from three. The two most frequent answers indicate that Internet access 'does not lead to more efficiency or lower costs' and a 'lack of time.' Hypothesis 5 can therefore be rejected.

As mentioned before, respondents were also asked whether they intended to gain Internet access within a year. Respondents, who claim to gain Internet access within a year, have no significant reasons for not obtaining Internet access. Respondents who are not planning on using the Internet had the following reasons: there is a 'lack of time' to implement the Internet and it 'does not lead to more efficiency or lower costs.' Reasons concerning frivolous use of the Internet by personnel, speed, and security are according to this survey not obstructing Internet access.

H<sub>6</sub>: Small firms in The Netherlands without Internet access have a negative image of the Internet.

To test hypothesis 6, seven statements concerning attitude towards the Internet were formulated. Six of these statements concern attitude towards the Internet in general and one is aimed specifically at the company. Again a five-point Likert-scale was employed to measure the respondents' attitude. Respondents were firms without Internet access or own Website. Some variables are reversely coded (indicated by (R) in Table 10). A mean significantly larger than three means a negative attitude on that particular variable towards the Internet.

Table 10 shows the results. It can be seen from Table 10 that there are no means significantly larger than three, whereas three variables are significantly smaller than three (variables 5, 6, and 7). This indicates a positive attitude on those variables towards the Internet. It can also be seen that small Dutch firms, not intending to gain Internet access, also have no means significantly larger than three (besides 'not suitable for my company'). However, this statement does not imply a negative attitude towards the Internet in general.

The results, as presented in Table 10, clearly indicate a positive image of the Internet instead of an expected negative. Hypothesis 6 can therefore be rejected.

H<sub>7</sub>: The most important reason, for small firms in The Netherlands with Internet access, for not having their own Website are the high costs.

Hypothesis 7 was tested with a question that gave several possible reasons why firms would not have a Website. A five-point Likert-scale assessing the degree to which a respondent (firm having Internet access, but without a Website) agreed or disagreed with each statement was used. The Likert-scale ranged from 'totally disagree' (1) to 'totally agree' (5). Statistical significance was calculated to see whether a statement had a mean significantly larger than three. These statements could then be described as real barriers obstructing an own Website. The results of a second question, which asked whether the responding firms were planning to have an own Website within a year, were used to divide the sample into two groups (Table 11).

Table 11 shows that for the whole sample only two variables are significantly larger than three, which indicates that these variables are the largest barriers hindering the firms in building an own Web page. The answers indicate that a Website 'does not lead to more efficiency or lower costs' and 'does not lead to more sales.' This proves that the assumption that an Internet Website is 'too expensive' is not the largest barrier. This evidence leads to a rejection of hypothesis 7.

Table 11 also shows that variable 3, 'lack of time', is a reason momentarily obstructing firms that have plans to have their own Website. Firms that do not want a Website within a year reasoned that it 'does not lead to more efficiency or lower costs' and it 'does not lead to more sales.'

**Table 10 Attitude Towards Internet. One Sample t-test, Test Value = 3<sup>a,b</sup>**

Variable	N	Whole sample		Firms with Internet access within a year		Firms with no Internet access within a year	
		Mean	SD	Mean	SD	Mean	SD
Not suitable for my company	63	3.30	1.52	2.42*	1.27	3.89***	1.37
Only new communication medium	60	3.15	1.45	3.22	1.40	3.15	1.52
Rage	60	2.85	1.53	2.56	1.40	3.09	1.61
The future for conducting business(R)	57	2.70	1.46	2.23***	1.24	3.10	1.54
No place for trade	54	2.31***	1.21	2.31*	1.26	2.32***	1.19
Suitable for promotion company and products(R)	59	2.29***	1.00	1.93***	0.83	2.59**	1.04
Only for technicians	55	1.87***	1.02	1.81***	1.02	1.93***	1.03

<sup>a</sup> \*\*\* $P < 0.01$ , \*\* $P < 0.05$ , \* $P < 0.10$

<sup>b</sup> An (R) indicates that these items are reverse coded. The questions are recoded in the following way: 1 = 5, 2 = 4, 3 = 3, 4 = 2, 5 = 1

**Table 11 Reasons for not Having Own Website. One Sample *t*-test, Test Value = 3<sup>a</sup>**

Variable	N	Whole sample		Firms with Internet Website within a year		Firms with no Internet Website within a year	
		Mean	SD	Mean	SD	Mean	SD
Does not lead to more efficiency or lower costs	35	3.66***	1.41	3.13	1.59	4.15***	1.09
Does not lead to more sales	39	3.51**	1.41	2.57	1.36	4.04***	1.20
Lack of time	37	3.24	1.69	3.94**	1.56	2.76	1.64
Too expensive	36	2.78	1.50	2.69	1.58	2.95	1.50
Technically too complicated	36	2.42**	1.30	2.19**	1.22	2.71	1.42
Too few other users	33	2.42**	1.28	1.93***	1.10	2.83	1.29
Unclear regarding law	35	2.26***	1.34	2.19**	1.38	2.45	1.43
Insecure	33	2.12***	1.22	2.20**	1.42	2.06***	1.06
Never thought about it	33	1.88***	1.22	1.60***	1.18	2.11***	1.23

\*\*\* $P < 0.01$ , \*\* $P < 0.05$ , \* $P < 0.10$

H<sub>8</sub>: Guarantee of message delivery is the largest concern for small firms in The Netherlands.

The last question examined the importance of a number of current issues surrounding Internet use. To test the hypothesis, all respondents (with or without Internet access/own Website) had to indicate on a five point Likert-scale their degree of concern regarding these issues. The Likert-scale ranged from 'not concerned at all' (1) to 'very concerned' (5). A variable with a mean significantly larger than three is regarded as a concern surrounding Internet use.

Table 12 shows that four issues surrounding Internet use have means significantly larger than three. These issues therefore depict concerns, and deal with 'security of financial information transmitted over the Internet', 'enforcement of contracts concluded over the Internet', 'unauthorised access internal networks', and 'interception messages by third parties.' It can be seen that 'guarantee of message delivery' has one of the lowest means. It is evident that it is not the largest concern for small firms, which leads to the rejection of hypothesis 8. Security issues still play a major role in the process of adopting the Internet.

## Conclusion and Discussion

The study presented in this paper provides evidence that small businesses are indeed catching on to the advantages provided by the Internet. However, pragmatic as most small business owners are, the short-term benefits must be readily apparent to make a significant investment in new technology and know-how.

This study shows that a number of the benefits that Dutch small firms are deriving, or will derive within a year, from their Websites can be described as 'border-crossing' (disappearance of distance related barriers now, continuous advertising all around the world next year). These results seem to confirm the 'international' image of Dutch businesses, well aware of the small size of the local market and always searching for potential business opportunities abroad. Brouthers *et al.* (1998) found that almost one-fourth of Dutch small businesses are *aggressively* pursuing new markets or new products. It seems that the Internet is one of the tools in this quest.

It was also interesting to see that more advanced uses

**Table 12 Degree of Concern Regarding Issues Surrounding Internet. One Sample *t*-test, Test Value = 3<sup>a</sup>**

Issues	N	Mean	SD
Security of financial information transmitted over Internet	118	3.72***	1.30
Enforcement of contracts concluded over the Internet	113	3.48***	1.27
Unauthorised access internal networks	116	3.31**	1.33
Interception messages by third parties	121	3.30**	1.40
Uncertainty regarding authenticity messages	121	2.99	1.38
Lower productivity because of improper use personnel	116	2.74**	1.31
Larger chance of fraud by personnel	113	2.61***	1.28
User-friendliness Internet	117	2.60***	1.20
Guarantee of message delivery	118	2.26***	1.15
Too few other users	111	2.26***	1.13

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.10$ .

such as obtaining information from suppliers, offering information to consumers, and contact with governmental agencies were used on a broader scale than might have been expected. The most technically advanced uses, such as receiving customer orders and voice/video conferencing, were however among the least used. Promising was the high growth potential these uses showed (expected growth of respectively 17 and 8 percentage points over a year). It seems justified to conclude that although small Dutch businesses use the Internet mostly for less advanced communication purposes at the moment, more advanced uses are already in use and their usage factor is bound to grow considerably in the near future.

One result of this study is that small Dutch firms' Websites are not being exploited to the full potential that electronic commerce technology can offer nowadays. Important in this respect is that the small firms' Websites are hardly integrated into the company processes. Again the informational aspect of the Internet is mostly used. Most Websites are not constructed to sell, to search for suppliers, or to be a part of an intranet or extranet. The technology of today does provide these opportunities and when seizing the fruits of electronic commerce in the future, Websites need to have more content to attract buyers (Reilly, 1997). But, likewise with the results of this study in mind one cannot state that small Dutch firms with a Website only show their face on the Internet. Already today a little less than one third of all Websites offer the opportunity to order electronically and 21 per cent provides customer service on its Website. These numbers show that part of the Websites are much more than electronic flyers. And, as already mentioned, the results of this study also show that one perceived benefit of a Website is increased sales. Also given the expected large growth of the Dutch electronic commerce market over the next years (Sanders, 1998b), one may expect an equivalent maturation of small firms' Websites.

The main barriers to Internet adoption and to developing a Web presence are simply the concern that the Internet or the Website would not lead to more efficiency or lower costs and the feeling that the Internet or a Website is not suitable for a particular business. In other words, small businesses do not see any direct benefits in it, and therefore do not want to invest time and money in an Internet presence. Small businesses show their pragmatic way of doing business in that investments should, in the short-term, make money or lower costs. Interestingly, the small businesses already having a Website claim in this survey that one of the benefits of their Website is increased sales. For policy makers wanting to increase the percentage of small businesses making use of the Internet, the best strategy of convincing small business owners of the benefits of electronic commerce is through showing *concrete* examples. In this respect one can think of showcases of similar

small firms that have achieved higher sales and/or cost reductions through the use of the Internet.

This study has shown that many Dutch small businesses are well on their way to using the Internet to reach new markets. The Dutch trader's culture has found its way into the Internet.

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**RITA WALCZUCH** *Universiteit Maastricht, Faculty of Economics & Business Administration, Strategie & Logistiek, Postbus 616, 6200 MD Maastricht, The Netherlands.*

*Rita Walczuch is senior research fellow and programme leader at the International Institute of Infonomics, Heerlen, The Netherlands and assistant professor of Information Management at Maastricht University, The Netherlands. She holds a MSc in Statistics and a Ph.D. in Management Information Systems from the University of Georgia, USA. Her research interests include electronic markets and electronic commerce, psychological determinants of trust in e-retailing, global information systems and trans-border data flow.*



**HENRIETTE LUNDGREN** *Universiteit Maastricht, Faculty of Economics & Business Administration, Strategie & Logistiek, Postbus 616, 6200 MD Maastricht, The Netherlands.*

*Henriette Lundgren is a student in the International Business Studies degree programme and research assistant at the University of Maastricht. She has been involved in various research projects in the broad field of Information Systems.*



**GERT VAN BRAVEN** *Universiteit Maastricht, Faculty of Economics & Business Administration, Strategie & Logistiek, Postbus 616, 6200 MD Maastricht, The Netherlands.*

*Gert van Braven holds a Masters of International Business Studies from the University of Maastricht, The Netherlands. His Master thesis was the basis for this article. He is currently working as a financial analyst at a transportation and distribution firm in Maastricht, The Netherlands.*