The Internet adoption decision in small and medium enterprises (SMEs)
Small is beautiful.

The best things come in small parcels.

From small beginnings come great things.

Proverbs
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1. Introduction

“Companies are now faced with the choices as to how and when to invest in another new communications medium – the Internet.” (Dandridge & Levenburg, 2000, p. 81) With over 400 million users worldwide (Nua Internet Surveys, n.d. a/2001, March 7) and an estimated revenue generation of above $700 billion (Nua Internet Surveys, n.d. b/2001, March 7) for 2001, it has certainly been elevated into the realm of other marketing channels such as television advertising or catalogue sales. Furthermore, the World Wide Web, its most popular service, offers even more than the traditional channels, the possibility of a true interactive communication down to the level of the individual (Dandridge & Levenburg, 2000; Lituchy & Rail, 2000). Despite the many general benefits of using the Internet for commercial purposes that various authors list in their works (see, e.g. Ng, Pan & Wilson, 1998), such as an immediate global reach, asking just “how” and “when” to invest, as indicated in the introductory citation, disregards one of the most fundamental questions, “why”. Being able to disregard it and taking the individual circumstances of a company not into account in deciding on a possible Internet strategy, would suggest that the Internet was a panacea. That this is not the case, however, has been shown by the increasing number of bankruptcies in the e-commerce sector and the reduction of Internet activities by even the largest companies like Disney (Heise, 2001). Using the Internet for a reason is especially important for small and medium sized enterprises [SMEs], as they lack the necessary amount of resources (Poon & Swatman, 1995) to handle failures of experiments with new technology or marketing channels. Their central status for the well-being of most developed economies (Walczuch, van Braven & Lundgren, 2000; Poon & Swatman, 1999) commands the development of a deeper understanding of why they decide to start using the Internet, which goes beyond the popular opinion that it is a necessity in today’s global information economy. Thus the following research question is investigated:

What are the factors that drive or inhibit the adoption of the Internet in small and medium sized businesses.

Previous research on Internet use by SMEs has lead to an extensive mapping of how the Internet is used by those who have already adopted it (Ng et al., 1998; Greaves, Kipling & Wilson, 1999; Lituchy & Rail, 2000; McCue, 1999; Dandridge & Levenburg, 2000). However, the knowledge about the adoption process itself, and specifically on the driving factors, is not well developed. Only fragments with explanatory power of why SMEs start using and use the Internet are scattered throughout a large number of studies.
The aim of this paper is to develop a comprehensive Internet adoption model for SMEs by composing these available fragments of both qualitative and quantitative nature into a coherent whole. A verification of the model, however, is outside the scope of this paper and should be provided by follow-up research projects. For these, the model could serve as a guide to focus attention and to arrive at meaningful results for both, the academic community and practitioners alike.

The paper is divided into two main parts. The first deals with SMEs and their current usage pattern of the Internet and argues for the necessity of and the benefits that can be derived from the proposed model. In the second part, the literature-based model is developed. The paper ends with a concluding chapter containing implications for further research and for practitioners, the decision makers in SMEs.

2. SMEs and the Internet today

Preparatory to the development of the model of the Internet adoption decision, it is important to define the setting the model is meant to operate in and what can be gained by it.

2.1. SMEs defined

The European Union defines an SME as a company with fewer than 250 employees and either an annual turnover not exceeding €400 million or an annual balance sheet total of less than €27 million. The classification is also made conditional upon the independence of the company; if other companies hold more than 25% its capital or voting rights, it is not classified as an SME (The Commission of the European Communities, 1996). Other legislative bodies set different cut-off values (see, e.g. Korea federation of Small Business, n.d./2001, March 7), but the actual size in terms of employees or turnover is not the main concern to the applicability of the framework to be proposed. Important is that the management and decision-making structure resembles that of a typical SME. In general it is less rationalized and formalized than in larger organizations (Brouthers, Andriessen & Nicolaes, 1998); the implications of this characteristic are described later.

2.2. Current usage

In general, SMEs have been slower in adopting the Internet than larger companies (Kleindl, 2000). Nevertheless, between 70 and 80 % had access to the Internet in 2000 in the USA (Cahners In-Stat Group, 2000; Dun & Bradstreet, 2000) and a quarter of all small businesses were reported to have a website (Verizon, 2000; Kelsey Group, 2001). Nevertheless, about
13% still had to invest in a computer (Faloon, 2000). Over the past years, the usage pattern has shifted from a focus on direct sales\(^1\) to one on promotion\(^2\) (Verizon, 2000). This might be explained by the relatively low sales figures of SMEs’ e-commerce sites as found by Poon and Swatman (1999) and McCue (1999).

### 2.3. Benefits of understanding SME Internet adoption

While Internet penetration among SMEs is on the rise, there obviously seems to be confusion about what to use the Internet for and whether they can gain from using it. As an important pillar to most developed countries economies (Walczuch et al., 2000; Poon & Swatman, 1999), it seems to be vital for SMES to be included in what is widely considered to be the future of business (Walczuch et al., 2000). Governmental and for-profit organizations are rushing to offer help and advice (Big help, 2001); see e.g. the electronic commerce activities of the OECD (n.d./ 2001, March 7). Solid advice requires knowledge about the factors that drive the adoption of the different uses of the Internet. Additionally to the “why”, also the process of the decision and its effect on what the Internet is to be used for has to be known. This will, for example, enable governments to develop programs that set the right incentives to get small businesses conduct business over the Internet. For commercial organizations and software developers, knowing the decision-making process and the “why”, helps avoiding pitfalls and can increase profitability by enhancing the ability to serve SMEs in a better way.

### 3. The Internet adoption model

Although there appears to be interest in the usage of the Internet by small and medium sized businesses, little research has been undertaken to provide a conceptual framework of the adoption process and specifically on the decision to adopt or not. The research on the topic of small and medium businesses and the Internet has mostly been exploratory in nature and focused on the type of usage and the benefit from and the barriers hindering adoption (Poon & Swatman, 1999; Walczuch et al, 2000; Mehta & Shah, 2001; Dandridge & Levenburg, 2000). Of the remaining authors, some focus more on practical matters and try to give advice to SMEs in how they should start using the Internet (see, e.g. Kleindl, 2000). Most list a multitude of generalized benefits of and barriers to Internet adoption. In doing this, they implicitly address the “why” of Internet adoption, but all findings are fragments that are not used to pro-

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\(^1\) Decrease in direct sales oriented sites from 1999 to 2000 by 48 %

\(^2\) Increase in promotional oriented sites from 1999 to 2000 by 123%
vide a complete picture of the adoption decision. A direct interest in the adoption process, and consequently the “why”, has been taken into account only in a study by Premkumar and Roberts (1999), who focused on communications technologies in general. Their proposed model (see appendix figure 1), however, cannot accommodate all findings from the other studies and has not been designed for the Internet adoption decision in specific.

In the following chapters, a new model, based on a literature review, is developed, which recognizes 4 different categories of influencing factors, environment, Internet, organization and product. These drive the adoption decision of the Internet in four generic application areas with the SMEs’ perception of the benefits and necessities acting as mediators. These are included to give attention to the voluntaristic nature of a decision. An overview of the model is given by figure 2 in the appendix; a detailed graphical representation is given by figure 3.

3.1. The adoption factors

Following the model suggested by Premkumar and Roberts (1999), the forces shaping the perception of the Internet by SME management are classified into categories. The three categories suggested by them, innovation characteristics, organizational characteristics and environmental characteristics were taken over using different headings, and supplemented by a fourth one, product factors. This fourth category was necessary to accommodate all factors identified in the reviewed literature.

It is important to realize, that all factors do not operate in isolation, but work jointly to form the perception of SME management of benefits of and needs to adopt the Internet in one form or the other. Their individual effects can multiply, as well as offset each other. However, to simplify the model, the four categories and their factors are treated as having separate, individual effects. Future studies have to take this into account, as some of the proposed effects may be obscured by the possible interactions.

3.1.1. Environmental factors

The first set of factors encompasses all external forces working on an individual SME by opening opportunities or pushing or pulling it to adopt the Internet as a new marketing channel. The factors identified in the literature can be divided into the competition in the industry, the vertical linkages and the availability of external support.

The stronger the internal competition within an industry, the more likely seems the search for, and the trial of, alternative and new channels to reach customers. Those firms to first adopt
the Internet will have a strong first mover advantage (Poon & Swatman, 1995), as the learning
curve on the Internet is steep and an established brand name crucial (Kleindl, 2000). To keep
the competitive disadvantage as small as possible, the others have to follow suit, whether or
not they perceive it as a beneficial venture or not. Adopting the Internet might in some cases
be a matter of pure survival. As customers learn to value the convenience and lower costs of
the Internet in searching for competitive information (Kleindl, 2000), they may, at a certain
point, only consider those alternative suppliers they can find on the Internet. The direct effect
of competitor’s usage of information technologies on the adoption decision has been identi-
fied by Premkumar and Roberts (1999) as a significant factor.
However, not only the competition may push a SME to adopt the Internet, also the parties at
the vertical linkages and their degree of readiness to use the Internet can be of influence.
Dandridge and Levenburg (2000) acknowledged in their study on small business’ use of the
Internet that “the potential for the marketer may depend on the increasing sophistication of the
consumer” (p. 88). In a similar vein, Parasuraman (2000) has argued that the readiness of cus-
tomers to use technology-based systems has an effect on what technology can be successfully
used, limiting the benefits that can be reaped. To measure “customers’ propensity to embrace
technology” (p.317), he developed the TRI, the technology readiness index, measuring the
“interplay between drivers (optimism, innovativeness) and inhibitors (discomfort, insecurity)
of technology readiness.” (p.317). It has been, for example, recognized that corporate custom-
ers seem to be more willing to conduct business at a distance via electronic means than con-
sumers as a result of their former intense use of facsimiles (Cotman, Devinney, Latukefu &
Midgley, 2000). The readiness of the customers or suppliers, if high enough, may also lead to
a push to Internet adoption. Premkumar and Roberts (1999) showed that the strength of verti-
cal linkages of franchises or subsidiaries to their parent organizations has a direct impact on
the adoption of communication technologies.
Various authors recognize also the geographic spread of the possible target group of the offer-
ing as a driving factor of Internet adoption. The Internet is often presumed to immediately
increase the reach of the business at low cost (see, e.g., Oviatt & McDougal, 1998; Metha &
Shah, 2001), thus the larger the spread, the higher the possible benefit. The influence has been
identified by Poon and Swatman (1995) and shown to exist by Verizon corporation (2000),
who found in a study on small businesses that 48% of the companies with a website believed
that “their customers came form outside a 50-mile radius. Only 20 percent of small businesses
without a website believe[d] the same.”
A further factor of importance, external support, is recognized by Said (2000), Barry (2000), Poon and Swatman (1995) and Prekumar and Roberts (1999). Said (2000), in a multi-case study on small businesses in Malta, identified the help of trade support organizations as an important factor in creating awareness of the possibilities of the Internet and giving advice and practical help. A similar role fulfills the US commercial service. Barry (2000) recognized the importance of this organization in helping small businesses in practical matters, like securing financing and helping in transportation related problems. There are also a large number of websites online, giving advice and providing tools to small businesses to help them profit from the Internet (Big help, 2001). Despite Premkumar and Roberts (1999) failed to show that support in implementing and using information systems has an impact on their adoption, they recognize that reality proves this result wrong and increased levels may heighten the perception of benefits of an adoption.

Concluding from the above discussion, the following propositions are arrived at:

**P1:** The higher the competitive pressure, the higher the perceived necessity of Internet adoption.

**P2:** The larger the geographical spread of the members of the vertical chain or customers and the higher their technology readiness, the higher the perceived necessity as well as benefits of Internet adoption.

**P3:** The higher the level of external support, the higher the perceived benefit of Internet adoption.

### 3.1.2. Internet factors

Naturally, also the properties of the marketing channel to be adopted influence the considerations of its benefits. One of the most often stated ones of the Internet for small and medium sized businesses is its global reach and low cost (see, e.g. Kleindl, 2000; Mheta & Shah, 2001). Their combined effect is verified in a case study by McCue (1999). Ng et al. (1998) arrive in their descriptive study on business use of the world wide web at the conclusion that SMEs “will continue to adopt the Internet as a means of enlarging their markets and, indeed, [...] in some sectors, the World Wide Web will enable small and medium-sized companies to tap into a global market that would otherwise be out of their reach” (p. 314). They also found, that setup and yearly maintenance costs of websites for business use are below $10.000 for the majority of businesses. Opposing is Kleidel (2000), acknowledging that nevertheless a large investment in personnel and infrastructure is necessary. Another frequently stated ad-
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The Internet undoubtedly offers a number of possible benefits, but they have to be seen in relation to the properties of other channels. The relative advantage of Internet technology is what in the end will be a driver of the perceived benefit. The larger the gap in effectiveness, the easier the benefit will be realized. It has to be noted, however, that organizations also think ahead and that the Internet adoption may not only be based on actual relative advantage in the present, but on the projected future advantage. On the level of perceived effectiveness, this was shown by Greaves et al. (1999) and Ng et al. (1998). The influence of relative advantage on the adoption decision has been verified by Premkumar & Roberts (1999).

Whether the relative advantage of the Internet will be recognized as such depends on a number of other factors, including the technological readiness of both the customers and the company as described above. The most important barrier to perceive the benefit of the Internet as a commercial medium is the security aspect, especially the security of online-payments. (Ng et al., 1998; Greaves et al., 1999; Mehta & Shah, 2001; Walczuch et al., 2000). Security concerns seem to have a major impact on the willingness to engage in more than communication and promotional activities on the Internet and may work irrespective of the perceived relative advantage.

Another factor working independent of the relative advantage of the Internet has been found to be the absolute cost level of the innovation to be adopted (Premkumar & Roberts, 1999). If the Internet engagement can be achieved cheaply, benefits might not have to be strong.

Concluding from the above discussion, the following propositions are arrived at:

**P4:** The larger the relative advantage of the web over existing channels, at present and in the future, and the lower the costs of the implementation, the larger will be the perceived benefit.

**P5:** The higher the security level of the Internet, the higher the level of perceived benefit.

### 3.1.3. Organizational factors

Alongside the offering, the characteristics of the SME itself can also have a profound impact on realizable and perceived benefits of Internet use. In small, and to a lesser extent in medium sized businesses, the pivotal figure in decision making is the manager, who is in most cases the owner himself (Premkumar & Roberts, 1999). According to a study by Brouthers et al. (1998), he tends to base his strategies on personal desires and background and acts less ra-
tional than those in large companies. For Internet adoption this means that if the manager is not convinced of the technology and does not provide support and resources, it is unlikely to be adopted (Dandridge & Levenburg, 2000). But not only the manager has to be ready to adopt the Internet, also the employees need to be ready to employ the technology in their work (Parasuraman, 2000). To measure both effects, the technology readiness index described before could be used to give a measure of the overall technology readiness of the organization, taking both manager and employee readiness into account. However, some modifications have to be made as it was originally designed for use with consumers. Within that modification, the IT expertise of the company could also be considered, which was found to be a factor of minor significance for technology adoption by Premkumar and Roberts (1999).

Another important effect can be assumed to originate from the size and the growth aspirations of the company. Dandridge & Levenburg (2000), in a study on very small companies, found increased usage of the Internet with firms having four and more full-time employees. This could be explained, on the one hand, by the increasing benefits of Internet technology, which can be reaped with size as full systems integration becomes feasible. This is one of the problem areas identified by Poon and Swatman (1999). On the other hand does increased size also lead to an increase in slack resources that permits experimentation in the light of unclear benefits (Premkumar & Roberts, 1999).

Growth expectations in terms of expected sales and employment, or export plans have also been shown to have a significant impact on Internet adoption (Dandridge & Levenburg, 2000). It can be assumed that higher expectations lead to an increased willingness to consider and try new marketing channels and perceive them as beneficial.

Concluding from the above discussion, the following propositions are arrived at:

**P6:** The higher the organizational technology readiness, the higher the perceived benefits of Internet adoption.

**P7:** The larger the organization and its growth aspirations, the higher the perceived benefits of Internet adoption.

### 3.1.4. Offering factors

Despite the well-explored finding that what is sold and to whom has a significant impact on the choice of the channel through which it is sold, only the exploratory study of Poon and Swatman (1999) has considered it as a factor of relevance. Their multi-case study allowed them to discern the nature of the product as a factor of influence on internet adoption.
The necessity of a digital representation of the offering on the Internet (Zott, Amit & Donlevy, 2000) has a differential impact on the feasibility of the later described four modes of Internet adoption. Concerning products, experience goods do not lend themselves well to sales through a website, while highly standardized goods, such as CDs, are more suitable (Greaves et al., 1999). Information based products in addition allow for a direct delivery via the Internet in digital form, for all others traditional delivery methods are needed. On the services side, those requiring the physical presence of both the service provider and the buyer limit the possibilities to SMEs, while those that can be provided directly via the Internet, such as online banking, allow a totally different set of possible benefits.

Concluding from the above discussion, the following proposition is arrived at:

**P8:** The more the product lends itself to the digital representation required by Internet the higher are the perceived benefits of Internet adoption by SMEs.

### 3.2. The mediating factors

The aforementioned factors do not by themselves lead to Internet adoption in SMEs. Although a direct impact at the population level can be established, and has been for some, at the level of the individual firm, the adoption is still a decision to be made. SME management is influenced by these factors in their perception of what the Internet can offer them on the one hand, and on the other may be given a feeling of necessity to adopt the Internet despite of a possible lack of benefits. They work on the decision maker, who becomes aware of and develops and understanding of the Internet. Both is required before the change, the adoption of the innovation Internet, in the organization can happen (Conner, 1992).

Nevertheless, as the rationality of the individual decision maker is limited, as is the information he receives, the adoption factors identified will have a differential impact. This is especially true due to the aforementioned limited rationality in the decision-making in SMEs (Brouthers et al., 1998). From this standpoint, only the perceived benefits or necessities, that is benefits or necessities as seen by the decision maker, will have an impact on the adoption.

#### 3.2.1. Perceived benefit

Perceived benefits were identified as an important factor influencing the communication technology adoption by Premkumar and Roberts (1999), however in their study it was used to measure the relative advantage of communication technologies. They did not consider it as a mediating, but as a direct factor. Poon and Swatman (1999) “found that perceived benefit is a
key reason why participants adopted and continue to use the Internet” (p. 11), in their study of small businesses and Internet use. They argue that perceived instead of real benefit is of particular importance, as direct benefits have shown to be rather low for SMEs in general and indirect benefits are hard to quantify. As consequence, they propose a division of the benefits into direct, quantifiable, and indirect, as well as short- and long-term benefits, which they recognized to have a differential effect on the adoption and retention of Internet activity. The former division has also been made by Walczuch et al. (2000).

While other authors have not made the explicit division along these two dimensions, it can be found in the benefits they list and tested. They can all be categorized either as savings and sales (direct, short-term benefit), marketing (indirect, short-term), relationship (direct, long-term), or new business (direct, long-term) related. Similar results about the importance of the different benefit categories were arrived at. “Looking forward to long-term, indirect benefits is the key motive for ongoing Internet commerce activities” (Poon & Swatman, 1999, p.11). The study by Walczuch et al. (2000) revealed also a prevalence of indirect benefits, but also recognized a positive expectation by the small Dutch companies for future direct benefits. Verizon (2000), however, revealed the opposite. It found that the enthusiasm of small businesses about the future impact of the web was combined with an increasing attention to indirect benefits in the area of promotional activity, instead of direct sales. These were found by several studies to be insignificant (Dandridge & Levenburg, 2000; Poon & Swatman, 1999; McCue, 1999).

In general, it can be assumed that a high level of perceived benefits will lead to the adoption of the Internet, and that especially indirect benefits are of importance. The distinction along short and long-term benefits, however, needs more attention.

Concerning what type of Internet involvement is chosen, the division in direct and indirect benefits proves fruitful. As direct benefits are cost and sales directed, the adoption of the Internet for reduction in communications costs or e-commerce in the areas of sales or procurement seems to be more probable than the creation of a website for representation purposes. The latter helps a company to improve its corporate image and disseminate marketing information – effects identified as indirect benefits (Poon & Swatman, 1999). If a company perceives high indirect benefits, this adoption option seems to be the most likely one, complemented by communications to disseminate marketing information.

Concluding from the above discussion, the following propositions are arrived at:

**P9: The higher the perceived benefit, the more likely is the adoption of an Internet solution.**
P10: *High perceived direct benefits will lead to the adoption of an e-commerce solution and the usage of the Internet as a communications platform, while indirect benefits to the use as a representation or communications medium.*

P11: *The main driver of Internet adoption are indirect, long-term benefits.*

### 3.2.2. Perceived necessity

In some cases, SME management does not have the choice of adopting the Internet for a benefit, but merely to secure the survival of the company by matching competitors’ moves or following customer or supplier demands. This side of Internet adoption has been largely disregarded. What has been found, as already discussed in the part on the environmental factors, suggests that these forces can have a crucial impact.

Lituchy & Rail (2000) acknowledge that for Bed and Breakfasts and small Inns, in the long run a web page will no longer be a source of competitive advantage and competition will come from businesses all over the world. In stating that the Internet use by these SMEs needs to become more sophisticated, they implicitly assume basic Internet usage to become mandatory. The ease the Internet offers to reach an international audience will eventually lead SMEs to adopt the Internet as they face increasing competition from foreign markets and they themselves have to search for customers in a larger geographic area. Also customers will increasingly demand companies to offer them the increased service level only the Internet can provide.

Supplier, customer and competitor pressures can thus, irrespective of the level of benefits perceived, lead to a positive Internet adoption decision in SMEs, if perceived as such by the decision makers. In such a case, the type of Internet usage chosen is a reactive decision and will be determined by the external pressures.

Concluding from the above discussion, the following proposition is arrived at:

P12: *The stronger the perceived necessity of Internet adoption, the more likely is the adoption, regardless of the level of benefits perceived.*

### 3.3. The adoption options

Internet adoption is no dichotomous decision. The Internet rather offers a variety of different applications which can be chosen from and which differ in terms of involvement, complexity and costs.
Walczuch et al. (2000) used a quite extensive list questioning for the ways companies use the Internet. A similar list can e.g. be found in Ng et al. (1998). Including all these options in the proposed model is outside its possible scope, due to the high number of variables necessary to be included. Additionally, it seems questionable whether the fine division, for example, in the different communications options including email, voice- and video-conferencing (as in Walczuch et al., 2000) would increase the understanding of the basic motives SMEs have to decide use the Internet.

A basic differentiation of companies online, according to only access and having a site online, was e.g. made by Walczuch et al. (2000) and Greaves et al. (1999). This division however seems to be too restrictive. Balancing completeness and complexity, a generic usage classification into four categories is suggested: Plain access, e-commerce limited to procurement activities, a website for representation purposes only and e-commerce involving online sales. All these elements were addressed in an unsystematic fashion by various authors (see, e.g. Greaves et al., 1999; Ng et al., 1998).

The plain access allows for information retrieval from the Internet and communication with other parties. The investment required is moderate, as is the scope of involvement. For online procurement, the plain access is still sufficient, but a deeper involvement is generated as Internet is used for transaction purposes. A website allows a company to present itself to the general public and to provide information to prospective and actual clients. It also requires a higher financial commitment to the Internet strategy. The deepest involvement, and commitment, is achieved when the company moves a part of, or its whole, business online allowing customers to order products over the web.

As indicated before, the interplay of the four categories of perceived benefits and the perceived necessity will determine if, and what of the generic applications will be selected.

### 3.4. Model limitations

With all the elements of the proposed model described, its inherent limitations have to be considered. Based on a literature review, an extensive number of factors of influence on the adoption decision have been identified. However, this list cannot be assumed to be exhaustive. Independent of the to be tested explanatory power of the model, further exploratory research should be directed at the identification of additional factors of influence. These could, for example, lie in the personal characteristics or the attitude towards the Internet of the decision makers. These and the ones already included should also be investigated for varying degrees of relevance in different cultural contexts.
Considering the model itself, three limitations have to be acknowledged. First, as already pointed out, the interactions between the identified factors are not considered in the model. This could lead to problems in identifying the individual effects. Second, the model only goes as far as the adoption decision, the actual implementation is not covered. As Walczuch et al. (2000) have shown, there are various barriers, for example time, which can delay, or in extreme cases inhibit, the enactment of the decision. Third, only little attention has been paid to the actual measurability of the variables included in the model.

It has to be realized that the model is a proposal to serve as a guide for further research. Empirical studies are necessary to validate and refine it.

4. Conclusion

The Internet holds many promises for SMEs, but its use is far from universal. This paper, based on prior research on the topic of SME Internet adoption and usage, identified factors, in 4 broad categories (environment, Internet, organization and offering), internal and external, which have differential effects on the decision. They, filtered by the perception of benefits and necessities, lead the decision to choose for one or more of 4 generic Internet applications (plain access, procurement oriented e-commerce, website for promotional purposes and sales oriented e-commerce). These elements were combined to form a model, which is displayed in its entity containing all factors in figure 3 in the appendix. On the basis of prior research, 14 propositions on the relations of the components of the model were arrived at (for a complete listing see listing 1 in the appendix). The model helps to create an understanding of the “why” of Internet adoption in SMEs and also, through the inclusion of the 4 generic choices, addresses the “what”. As indicated in the propositions, the “why” has distinct differential effects on what the companies choose for, if at all.

4.1. Managerial implications

The insights that can be gained, will, if the model is validated, help on the one hand Internet companies to better assess the needs of SMEs and develop profitable applications and services. Governmental organizations setting up programs to encourage SME Internet adoption will profit from the knowledge in being able to set the right incentives and to provide advice or help in the necessary areas. Of importance may be here the insight gained from the model of the central importance of the owner, the decision-maker, and his perception as the pivotal element. On the other hand will SMEs profit themselves form the model. Their managers could use it as a means to formalize and rationalize their decision making process.
4.2. Academic implications

For the academic community, the proposed model is among the first attempts to formalize the research conducted on SME Internet adoption. It helps to create a focus and to escape the purely exploratory nature of most studies conducted until today.

Realizing the aforementioned limitations, future research should test the model in different cultural settings. The propositions arrived at can serve as a basis for the hypotheses development. Baring in mind the exploratory basis the model is built on, alternative or additional factors and relationships should also be searched for and be included after being tested for relevance in the context of the model.

Of specific interest would be, after the initial tests, the extension of the model to include the actual adoption. This would require a set of adoption barriers to be introduced to the model, but the increased complexity would allow for the complete understanding of the “why” or “why not” also from a retrospective point of view. It would then be possible to analyze the existing pattern of Internet adoption among SMEs. Nevertheless, for the first studies, the basic model presented here should prove to be complex enough.
Appendix:

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<td>Complexity</td>
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<th><strong>Organizational Characteristics</strong></th>
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<td>Vertical Linkages $^2$</td>
</tr>
</tbody>
</table>

Figure 1: Research model by Premkumar and Roberts (1999)

Figure 2: Internet adoption decision in SMEs – model overview

$^1$ – Supported for E-mail adoption

$^2$ – Supported for Internet adoption
The Internet adoption decision in small and medium enterprises (SMEs)

**Listing 1: Model propositions**

<table>
<thead>
<tr>
<th>Adoption factors</th>
<th>Mediating factors</th>
<th>Internet</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Environment</strong></td>
<td><strong>Perceived benefit</strong></td>
<td></td>
</tr>
<tr>
<td>- competitive pressure</td>
<td>Direct</td>
<td>Savings &amp; Sales</td>
</tr>
<tr>
<td>- geographical spread</td>
<td>Indirect</td>
<td>Marketing</td>
</tr>
<tr>
<td>- technology readiness</td>
<td></td>
<td>New business</td>
</tr>
<tr>
<td>- external support</td>
<td>short-term</td>
<td></td>
</tr>
<tr>
<td><strong>Internet</strong></td>
<td><strong>Perceived necessity</strong></td>
<td></td>
</tr>
<tr>
<td>- relative advantage</td>
<td></td>
<td>long-term</td>
</tr>
<tr>
<td>- implementation cost</td>
<td></td>
<td></td>
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<tr>
<td>- security</td>
<td></td>
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<tr>
<td><strong>Organization</strong></td>
<td></td>
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<tr>
<td>- organizational</td>
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<tr>
<td>technology readiness</td>
<td></td>
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<tr>
<td>- growth aspirations</td>
<td></td>
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<tr>
<td><strong>Offering</strong></td>
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<tr>
<td>- product/service</td>
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<tr>
<td>characteristics</td>
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</tbody>
</table>

**Figure 3:** Internet adoption decision in SMEs – complete model

**Environment**

P1: The higher the competitive pressure, the higher the perceived necessity of Internet adoption.

P2: The larger the geographical spread of the members of the vertical chain or customers and the higher their technology readiness, the higher the perceived necessity as well as benefits of Internet adoption.

P3: The higher the level of external support, the higher the perceived benefit of Internet adoption.

**Internet**

P4: The larger the relative advantage of the web over existing channels, at present and in the future, and the lower the costs of the implementation, the larger will be the perceived benefit.

P5: The higher the security level of the Internet, the higher the level of perceived benefit.

**Organization**

P6: The higher the organizational technology readiness, the higher the perceived benefits of Internet adoption.

P7: The larger the organization and its growth aspirations, the higher the perceived benefits of Internet adoption.

**Offering**

P8: The more the product lends itself to the digital representation required by Internet the higher are the perceived benefits of Internet adoption by SMEs.

**Perceived Benefit**

P9: The higher the perceived benefit, the more likely is the adoption of an Internet solution.

P10: High perceived direct benefits will lead to the adoption of an e-commerce solution and the usage of the Internet as a communications platform, while indirect benefits to the use as a representation or communications medium.

P11: The main driver of Internet adoption are indirect, long-term benefits.

**Perceived Necessity**

P12: The stronger the perceived necessity of Internet adoption, the more likely is the adoption, regardless of the level of benefits perceived.
Reference list


