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# INCIPIENT NETWORKS AS CONSEQUENCES OF INTERNET WEB SITE DEVELOPMENT AMONG SMALLER MANUFACTURING ENTERPRISES


**by**

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## INTRODUCTION

Smaller manufacturing enterprises (SMEs) are increasing their Internet exposure.  It is difficult, however, to assess the impact their Internet exposure on their individual operations. Some SMEs report a relatively high level of success, especially in those cases where the SMEs have systematically evaluated the potential impact of their web site strategy and systematically integrated their web site into their short and long-term operations. For many SMEs this requires systematic and periodic maintenance of their web site to generate successful sales and marketing results (Tagliabue, 2001).  Those SMEs that have not integrated their web sites into their day-to-day operations are experiencing market resistance and even a loss of market share (Oakham, 2000).

Recent studies and government reports suggest that, in order for SMEs to have successful Internet exposure, they will have to take an aggressive, proactive approach to the Internet (The Economist, 2000 and Wiseman, 2000).  Those SMEs that have integrated their web sites into their day-to-day operations and developed a comprehensive Internet strategy within the context of their overall information technology strategy report overwhelming increases in their market potential and in actual sales.  In addition, they report that the number of unsolicited inquiries received over the Internet has increased considerably (Kenny and Marshall, 2000).

The use of web sites has created a new global commercial environment for SMEs.  By placing a web site on the Internet many SMEs are automatically drawn into a new world of commerce.  Since a conventional web site is an integral component of today's information technology, placing a web site on the Internet also implies an entry into the world of

information technology. However, it appears that, from a strategic perspective, some SMEs are reluctant and unprepared to fully utilize their web site within the limits and capabilities of the internal information technology strategy or information technology that is available to them. In reality they open their sales and marketing operations to unexpected and unpredictable events.

Many of these SMEs become unwilling members of networks. Some of these networks represent valid and commercially viable networks while others represent tentative and unstructured potential networks depending on how much information these networks are able to collect from the web sites posted by SMEs on the Internet. Potential customers and suppliers are constantly surfing the Internet to find new sources of products and services or potential customers for their own products or services. If the SMEs offer a substantial amount of information on their web site, they can be attracted to well organized and stable networks, however, when SMEs offer only a minimum amount of obsolete or insufficient information, the types of networks they may be attracted to might be less desirable. A recent study suggests that those SMEs that post their web sites on the Internet provide limited information for their customers or suppliers and, in many cases, seldom up date or maintain their web site (Moini and Tesar, 2000).

The SMEs that tend to provide a limited amount of information on their web sites and fail to maintain their web sites in a timely fashion also tend to be *passive* in terms of how they respond to contacts and inquiries received through their web site, and consequently, how they approach their participation in any network. It appears that they simply prefer to use their web site as a rather passive component of their overall promotional effort. Therefore, because of their passive behavior, potential customers or suppliers tend to draw these SMEs into existing or potential networks. Some of these networks are evolving simply as a result of a new web site being posted on the Internet. However, regardless of when these web sites are

posted or how they are identified, for many passive SMEs these *incipient networks* create significant operational and strategic problems because they become drawn into networks that may not be optimally beneficial for them.

The objective of this paper is to examine the issue of incipient networks from the point of view of passive SMEs. Informal networks form rapidly on the Internet. Potential customers or suppliers have difficulty evaluating the real potential contributions of passive SMEs to informal networks. The limited amount of information provided by passive SMEs on their web sites, along with their reluctance to frequently up-date their web sites, create significant problems for members of any incipient network. In fact, members may enter into incipient network too early, expecting that additional information might be available later, and it is not. Consequently, the commitment that potential members make to the incipient network may represent for them inefficient use of their resources.

This presentation is based on an ongoing larger international study of SMEs and their involvement in industrial networks as a result of their Internet exposure. The preliminary results of the larger study suggests that: (1) some SMEs place a web site on the Internet without formulating a comprehensive internal strategy regarding how the SME will manage and utilize the web site in the future and (2) other SMEs tend to respond to information generated by the web site in a guarded way; that is, they may choose not to use the information for any significant marketing activities. As a part of this presentation a model was developed to reduce both of these tentative attitudes among the SMEs included in this study. The model places the problem of passive SMEs and their use of web sites in broader context of information technology.

## INCIPIENT NETWORKS PROBLEM

In the age of information technology many SMEs feel obligated to develop and post a web site on the Internet. This tendency may primarily have a competitive component to it. The amount of information available about the Internet and its use today is overwhelming (The Economist, 2000). Information technology specialists who offer electronic solutions for day-to-day management problems constantly approach SMEs with a variety of solutions to their strategic as well as operational challenges (Wright, 2001). For example, the *E-Business Suite by Oracle®* is frequently advertised in the popular media, in business magazines, and newspapers, and even professional meetings, as the unique answer to management information systems designed to integrate information technology, including the Internet, into day-to-day sales and marketing operations of the firm (Oracle Corporation, 2001). Many managers responsible for SMEs' success are left with a clear perception that if they do not fully utilize today's information technology and connect to the Internet, their future in the global market place may be uncertain.

SMEs naturally respond to pressures from the market place, their potential customers, and suppliers. Since many of their potential customers and suppliers are connected, they expect that their future business associates will also be connected. SMEs respond to these pressures by posting their web sites without fully considering the strategic implications of their web sites. This is particularly true in those cases where SMEs simply post a minimal amount of information on their web sites and do not periodically up-date the information.

A recently completed study of a local cluster of SMEs reveals that they tend to include the following information on their web sites: (1) the SME's location, (2) how to contact the sales department, (3) and information about their products or services. In most instances this information is not systematically managed nor is it periodically up-dated (Moini and Tesar, 2000). As a comparison, the *E-Business Suite by Oracle®* recommendation suggests that

firms utilize the following categories of information in general as part of their information technology and Internet strategy: (1) marketing, (2) webstore, (3) sales, (4) support, (5) procurement, (6) supply chain, (7) accounting, (8) human resources, (9) applications, and (10) databases (Oracle Corporation, 2001).

An even greater problem for many passive SMEs is that the unmanaged Internet exposure can generate an overwhelming amount of information, including large number of sales and marketing inquiries that may, in the short term, actually become a hindrance to their conventional commercial operations (Wise and Morrison, 2000). More importantly, however, the Internet exposure may lead a SME into a number of different incipient networks. Although many SMEs may actively participate in a variety of formal and conventional industrial networks already, they may not want to have additional experiences in informal and unstructured incipient networks on the Internet (The Economists, 2000).

This tendency is demonstrated by the fact that, based on a series of recent preliminary interviews and discussions with SMEs' managers conducted for the major part of this study, installing a new Internet web site exposes SMEs to a rapidly forming network of potential customers and suppliers over which the SMEs' may have little control.

This proposition has recently been discussed in conjunction with the development of teaching cases, for example. It appears that this proposition represents a significant concern for many SMEs' top managers. Their concern is based on the following premise. The purchasing personnel of a potential client firm may automatically enter the Internet address of a recently posted web site into the directory of its active or potentially active suppliers. In some cases, using a customized search engine instructed to detect any new web site listings potential clients can generate new and more up-dated suppliers' lists. SMEs become targets of potential client firms instantly after they post their web site--sometimes instantly. A number of commercial organizations such as marketing research firms, trade organizations,

and even government agencies, among others, are connecting with SMEs that have installed a web site on the Internet. In reality, through these connections (or, so- called "hits") SMEs become participants in incipient networks in which they may not want to participate. SMEs' top management is suggesting that the number of these types of unintended, and mostly undesirable, incipient networks is growing rapidly.

Since these networks evolve almost immediately after an Internet web site has been posted, and the initiatives to form unintended or undesirable networks are taken by potential customers or suppliers, many passive SMEs perceive these incipient networks as unresponsive. The number of passive SMEs that exhibit this type of behavior appear to be significant since, according to a recent study, only twenty percent of SMEs maintain a viable Internet web site (Moini and Tesar, 2000). The result of their study (See Table 1) also suggests that the twenty percent of SMEs post information about products, contacts, history, and sales and marketing on their web site.

**Table 1**
**Content Analysis of SMEs' Web Sites**

| Web sites features | n | Percentage |
|---|---|---|
| Product information | 107 | 98.2 |
| Contacts | 105 | 96.3 |
| History | 94 | 86.2 |
| Sales and marketing | 68 | 62.4 |
| News | 50 | 45.9 |
| Personnel (sales support) | 24 | 22.0 |
| International aspects | 20 | 18.3 |

n = 109 firms
Source: Moini and Tesar, 2000.

In general, for many firms today, use of an Internet web site goes far beyond the dissemination and collection of information. Internet web sites become portals into the overall operations of firms. Firms tend to develop comprehensive marketing strategies based on their interactions with their network partners and develop strategies for managing the information process via their portals. Some firms actually develop strategies for generating intelligence

within relevant networks and use that intelligence to further their marketing objectives (Sawhney and Parikh, 2001). In addition, the Internet becomes indispensable for the development and implementation of a corporate competitive strategy (Porter, 2001).

In this context, SMEs need to utilize their Internet web sites more effectively and efficiently; they also have to use them strategically to maximize their future competitive position in the market along with their information needs and expectations. At the same time, they need to be critical of what kinds of networks they enter. They need to keep in mind that the concept of incipient networks is a relatively recent byproduct of Internet web sites. The ability to generate commercial intelligence from web sites in general is growing rapidly. SMEs need to develop a systematic approach not only to their use of Internet web sites, but they also need to understand how to integrate these web sites into their overall information technology strategy.

**IMPLICATIONS**

In order to maximize their information technology strategy, including the Internet web site strategy, the following model is proposed for SMEs. The model is designed to respond to two fundamental concerns: (1) examining the strategy of posting a web site on the Internet in the context of an SME's overall information technology strategy and (2) minimizing the SME's possibility of entering into undesirable (incipient) networks.

The paper proposes a model that is presented in Figure 1. This is a preliminary model that attempts to draw connections between various aspects of SMEs' management and the availability of information technology. The information for this model was generated from a series of discussion with SMEs managers and information technology specialists in the United States, Sweden, and Finland. The model is based on the notion that SMEs need to formulate a set of comprehensive strategic and operational goals. Among these goals, the role of their

web site on the Internet needs to be clearly defined.  The second aspect of this model focuses

on the development of a framework that is designed to link information technology within the

SME to its corporate strategy.  This framework needs to be developed in terms of the SME's

investments in information technology and its strategic planning process.

**Figure 1**
**SME's Internet Web Sites, Information Technology (IT), and Strategic and Operational Goals**
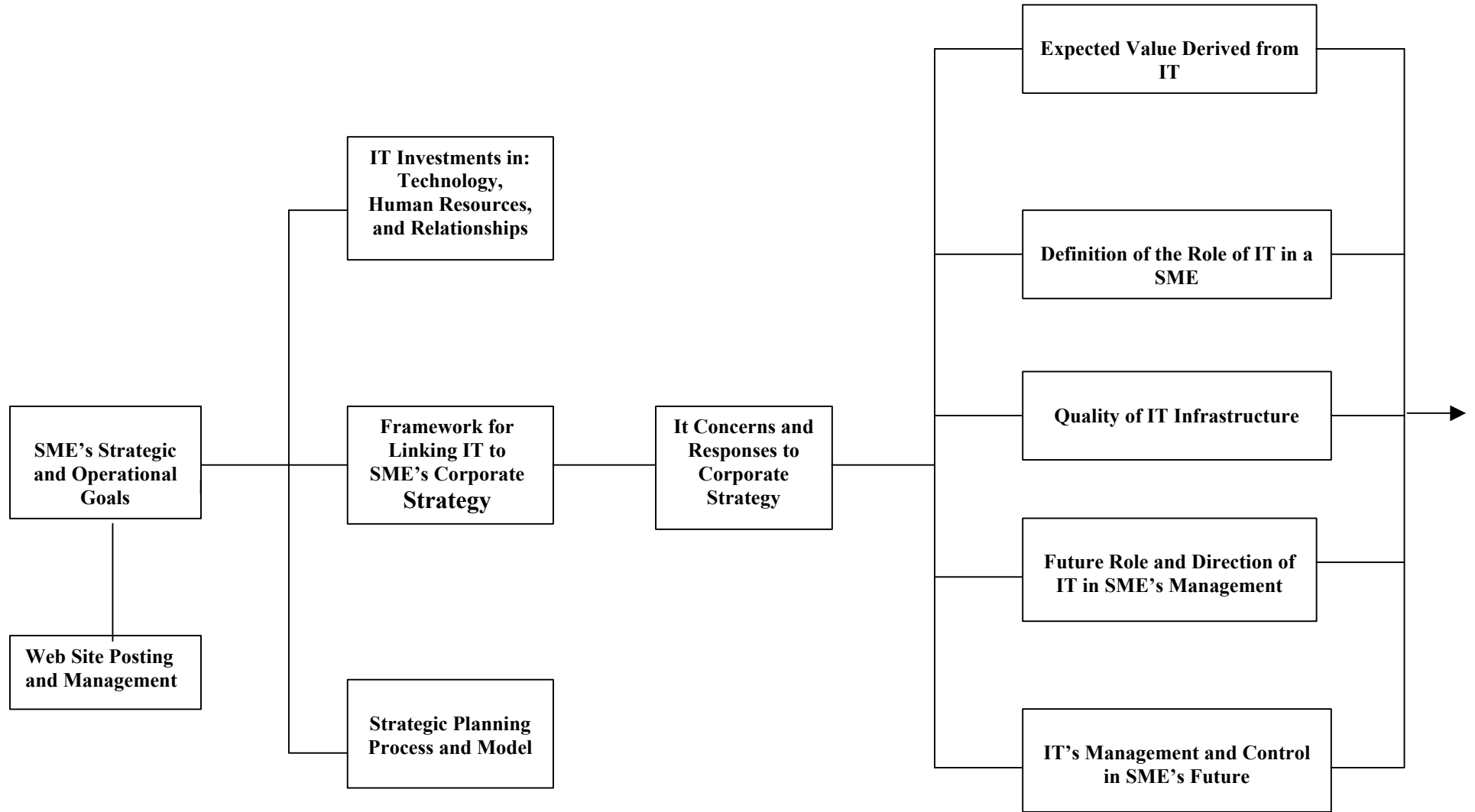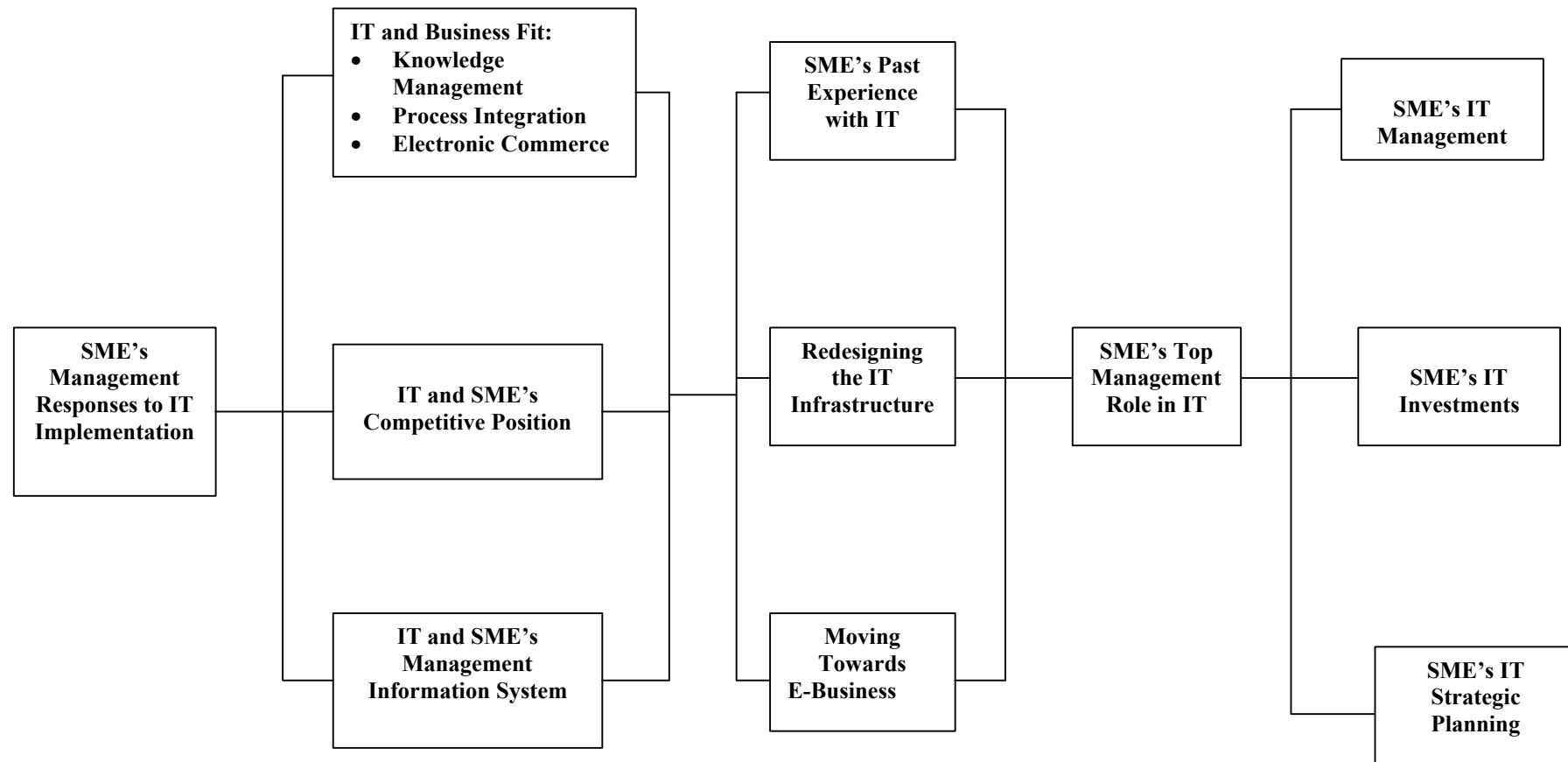**Model: Part I—Issues and Concerns**

**Figure 1 (continued)**
**SME's Internet Web Sites, Information Technology (IT), and Strategic and Operational Goals**
**Model: Part II – Responses and Implementation**

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                          ┌──────────────────────────┐
                          │ IT and Business Fit:     │
                          │  • Knowledge             │
                          │    Management            │      ┌──────────────┐
                          │  • Process Integration   │      │ SME's Past   │      ┌──────────────┐
                          │  • Electronic Commerce   │      │ Experience   │      │ SME's IT     │
                          └──────────────────────────┘      │ with IT      │      │ Management   │
                                                            └──────────────┘      └──────────────┘

  ┌──────────────┐        ┌──────────────────────────┐      ┌──────────────┐      ┌──────────────┐      ┌──────────────┐
  │ SME's        │        │                          │      │ Redesigning  │      │ SME's Top    │      │ SME's IT     │
  │ Management   │        │ IT and SME's             │      │ the IT       │      │ Management   │      │ Investments  │
  │ Responses to │        │ Competitive Position     │      │ Infrastructure│     │ Role in IT   │      └──────────────┘
  │ IT           │        │                          │      │              │      │              │
  │ Implementation│       └──────────────────────────┘      └──────────────┘      └──────────────┘
  └──────────────┘
                          ┌──────────────────────────┐      ┌──────────────┐      ┌──────────────┐
                          │ IT and SME's             │      │ Moving       │      │ SME's IT     │
                          │ Management                │     │ Towards      │      │ Strategic    │
                          │ Information System        │     │ E-Business   │      │ Planning     │
                          └──────────────────────────┘      └──────────────┘      └──────────────┘
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All the concerns regarding information technology also need to be considered on the corporate strategy level.  These concerns include: (1) the expected value derived from information technology, (2) the role information technology will take in a given SME, (3) the quality of the information technology infrastructure, (4) the future role and direction of information technology in the SME's management, and (5) the future of information technology management and control within the SME.

Once these issues and concerns have been resolved, the SME's management needs to consider how it will respond to implementation of a comprehensive information technology strategy.  The SME needs to clearly determine where and on what level is the best fit between its information technology and its concept of its core business.  This should be accomplished in the context of knowledge management, process integration and the notion of electronic commerce.  At the same time the SME needs to examine the relationship between information technology and its competitive position.  In addition, the SME's information system needs to be developed based on its level of information technology.  However, the above issues may not be simple to assess and develop.  The SME also needs to consider its past experiences with information technology; it may need to redesign its information technology infrastructure as it moves towards electronic business.

The most important part of this integration process between the core business of the SME and its use of information technology depends on what role top management will take in managing information technology within the SME.  Top management needs to be instrumental in developing a strong information technology management team; it must be willing to invest in information technology and to incorporate information technology in its strategic planning process.  If the SME's top management does get involve in integrating information technology in its strategic planning, issues such as mismanaging web sites or belonging to the wrong networks can be minimized.

# CONCLUSION

A significant number of SMEs tend to post their web sites on the Internet without carefully considering the implications of their action.  As a result, some SMEs are drawn into networks that may not necessary be compatible with their overall corporate strategy.  This is primarily because today's information technology generates tools and techniques that instantaneously monitor development on the Internet.  If a new web site opens, a potential customer or supplier to a SME will find it.

SMEs need to carefully assess the implications of posting a web site on the Internet.  They need to effectively integrate their web site into their overall strategy before opening the web site.  SMEs also need to understand that a web site is an important strategic component of their corporate information technology.  Effective management of a web site becomes an important asset for the overall strategic and operational management of a SME.

The notion that those SMEs that do not effectively manage their web sites are frequently drawn into incipient networks is very important.  The consequences of this action can generate a variety of problems for SMEs; especially those SMEs that tend to ignore their web sites once they have been posted on the Internet.  This is an area that needs additional research.  Most SMEs' managers directly concerned with these issues suggest that the approaches used in managing web sites within the context of information technology developed for the large firms may not necessarily be useful for many SMEs.

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