

# Interacting with Customers on the Internet: Developing a Model for Small Businesses

Stephen Burgess

Victoria University of Technology, Ph: 61 3 9688 4353, [Stephen.Burgess@vu.edu.au](mailto:Stephen.Burgess@vu.edu.au)

Don Schauder

Monash University, Ph 61 3 9903 2847, [Don.Schauder@sims.monash.edu.au](mailto:Don.Schauder@sims.monash.edu.au)

## ABSTRACT

A number of models have been used in the past two decades to assist firms to identify ways that they can use information technology (IT) to add value to their products and services. This paper examines the concept of using IT to add value to products and services and looks at a number of different models that have been used to achieve this. An analysis of the steps of the models reveals that they each possess a number of common steps in their practical application. Some recent models that have been designed specifically for electronic commerce are examined for the same purpose and shown to have a similar set of basic steps. Finally, a model is proposed that attempts to address the needs of small businesses that wish to interact with customers on the internet. A method of testing the model is suggested. Application of the model could provide small businesses with the planning methodology that they often lack to review their internal and external resources and identify a basic web site strategy before attempting to develop their web site.

## 1 INTRODUCTION

A number of models have been used in the past two decades to assist firms to identify ways that they can use information technology (IT) to add value to their products and services. This paper examines the concept of using IT to add value to products and services and looks at a number of different models that have been used to achieve this. An analysis of the steps of the models reveals whether or not that they each possess a number of common steps in their practical application. Some recent models that have been designed specifically for electronic commerce are examined for the same purpose. Finally, a model is proposed that addresses the needs of small businesses that wish to interact with customers on the internet.

## 2 IDENTIFYING STRATEGIC INFORMATION TECHNOLOGY OPPORTUNITIES

### 2.1 What is Value?

Porter and Millar (1985) define value as the amount that buyers are willing to pay for a product or service. They mention three ways that organisations can use IT to add value to their products or services (these are known as the three generic strategies for improving competitiveness):

- Be the low cost producer
- Produce a unique or differentiated product
- Provide a product or service that meets the requirements of a specialised market.

### 2.2 Other Strategies

In addition to Porter's suggested three generic strategies, there are a number of other strategies that firms can adopt (O'Brien):

- **Innovation:** occurs when an organisation invents new ways of doing business.
- **Growth:** involves the expansion of an organisation's capacity to produce goods and services and/or expanding into new markets.
- **Alliance:** the establishment of a business linkages or alliances with other firms.

Bergeron and Raymond (1992) suggest that the strategies of most importance to small businesses are cost, differentiation and growth.

## 3 MODELS THAT ASSIST IN THE IDENTIFICATION OF IT OPPORTUNITIES

The purpose of this section is to examine some of the models which currently exist to assist organisations to identify IT investments that add value to a firm's products and/or services. A common feature amongst all of these models is that they require some form of business investigation to be performed before any IT investment can be recommended.

### 3.1 Business Investigation: Identifying areas where IT can be useful

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### 3.1.1 Critical Success Factors

John Rockart introduced the concept of critical success factors (CSFs) in 1979. CSFs are the limited number of areas in a firm in which satisfactory results will ensure successful competitive performance for the organisation. If the results in these areas are not adequate, the organisation's efforts for the period will be less than desired. As a result, CSFs are areas of activity that should receive constant and careful attention from management (Rockart; Senn (1990); Frenzel (1992)).

The steps of a CSF analysis are (Alter):

- Identify the primary mission of the organisation.
- Identify critical success factors.
- For each CSF, identify measures of performance that can be tracked.
- Develop systems for collecting this information.

IT could be effectively used in the final step to identify the types of systems that are needed most by the organisation to assist CSF performance.

### 3.1.2 SWOT Analysis

Whilst CSFs are effectively a management tool, SWOT analysis has been traditionally used in the marketing or economics areas. The term **SWOT** is an acronym for **Strengths, Weaknesses, Opportunities and Threats**. An analysis is performed on the internal and external areas of the organisation to identify current or potential strengths and weaknesses when compared with other competitive forces (such as customers, competitors and suppliers). From this analysis, the organisation identifies actual or potential opportunities to gain strategic advantage or threats to the organisation's well being. Actions taken by the organisation to take advantage of an opportunity are **proactive** and to combat a threat are **reactive** (Kotler et al).

The analysis should examine areas such as resources, skills, customer types and preferences, company image and ability to control distribution and resellers. (Kotler et al):

Once an actual or perceived opportunity or threat has been identified, the organisation can examine ways in which IT can be applied in a proactive or reactive manner.

## 3.2 Model Introduction

A number of models have been used to assist firms in identifying strategic IT projects. The following subsections introduce some of these models. Each model presented has a different approach to the business investigation, the first stage of each model.

### 3.2.1 Porter and Millar (1985) - The Value Chain

#### 3.2.1.1 Rationale for the model

Porter and Millar proposed the value chain model to assist general managers to respond to the challenges of the information revolution.

#### 3.2.1.2 Model Description

An organisation's value chain is 'a system of interdependent activities, which are connected by linkages. Linkages exist when the way in

Figure 2: The Value Chain Model (adapted from Porter and Millar, p.151)

which one activity is performed affects the cost or effectiveness of other activities' (Porter and Millar, p.150). For instance, a more costly product design and more expensive raw materials can **reduce** after sales service costs and (perhaps) provide some marketing benefits due to improved product or service quality.

The value chain consists of value activities, which are the activities that a company performs in producing their products or services. Porter and Millar divide these activities into nine categories. Five of these activities are known as **primary activities**:

- Inbound Logistics: any activity that involves the purchase, storage and transfer of raw materials, up to the stage of production.
- Operations: the conversion of raw materials to finished product.
- Outbound Logistics: any activity that moves the finished product to the buyer.
- Marketing and Sales.
- Service: Any service provided to the buyer after delivery has been made.

3.2.1.3 Business Investigation and Strategy

The first step is to identify each primary activity of the organisation, which is then analysed to see whether or not it **adds value** to the organisation's finished product or service **in the eyes of the customer**. This highlights the customer focus that Porter and Millar identify as being so important. Any activity that is deficient in this area is a potential target for an appropriate IT investment (Porter and Millar). This section does not use CSF or SWOT analysis techniques.

3.2.1.4 Identifying the Strategic IT Opportunity

Porter and Millar provide two areas of assistance in assisting the organisation to identify appropriate IT investments to match target areas defined in the previous step.

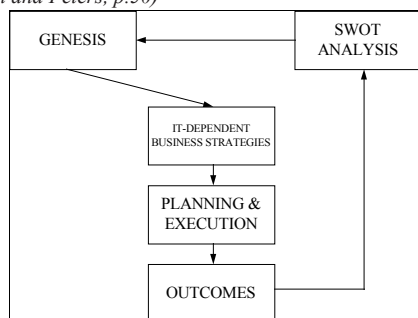
- **Transforming the Value Chain.** IT can transform the way each value activity is performed, as well as the nature of the link between each activity. Each value activity is made up:
  - A physical component. This relates to the **physical tasks** required to perform the value activity (historically, these been the components affected by technological progress).
  - An information-processing component. These are the steps required to capture, manipulate, and channel the data necessary to perform value activities (developments in this area are now advancing rapidly).
- **Changing the Nature of Competition.** Briefly summarised, this can be achieved by (Porter and Millar):
  - Changing the industry structure by locking in customers, reducing the power of suppliers, being aware of the threat of new entrants and being aware of the threat of substitute products.
  - Creating competitive advantage using the three generic strategies.
  - Creating new businesses based around IT.

3.2.2 Barton and Peters (1991) - Synthetic Framework for IT

3.2.2.1 Rationale for the model

Barton and Peters (1991) designed this model in response to demand from industry for suitable guidelines as to how to best identify and exploit IT for competitive advantage.

Figure 3: Five Elements of IT-derived Competitive Advantage (adapted from Barton and Peters, p.50)



3.2.2.2 Model Description

The operation of the model is described in the following sections.

3.2.2.3 Situational Factors/ SWOT analysis

This stage is the **business investigation**. This is virtually a SWOT analysis.

3.2.2.4 Genesis

After the SWOT analysis, threats and opportunities have been identified. At this stage, proactive or reactive strategies are identified (Barton and Peters).

3.2.2.5 IT-Dependent Business Strategy Alternative

The aim of this step is to identify a strategic IT opportunity that fits the suggested strategy. According to Barton and Peters, competitive advantage can be achieved by:

- **Improving Information:** improving the way information is available to support the firm's functioning.
- **Improving Market Position:** improvements in how customers perceive the firm's offerings.

3.2.2.6 Other Steps

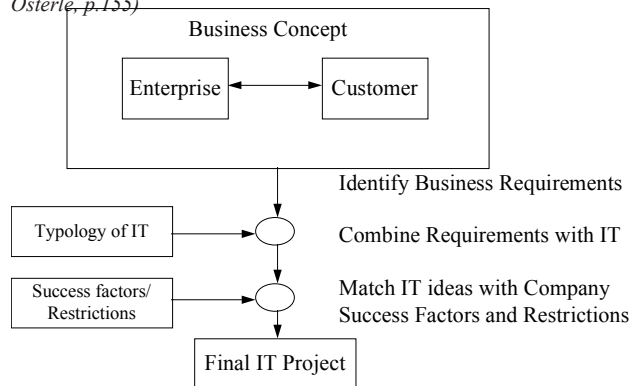
Other steps of the model relate to implementation issues and a review of the IT investment.

3.2.3 Osterle (1991) - Generating Business Ideas Using IT

3.2.3.1 Rationale for the model

This model attempts to describe a method of innovation through IT, with an emphasis on the **links** between enterprises and business partners.

Figure 4: Procedure for generating and selecting IT ideas (adapted from Osterle, p.155)



3.2.3.2 Identify Business Requirements

The first task is to analyse actual and potential customer relations. This involves ascertaining the business needs of the customer and supplier that are capable of communicating with each other. It is necessary to look through the business functions of both enterprises to identify relationships [business functions relate fairly closely to Porter's value activities] (Osterle).

3.2.3.2.1 Critical Functions

Any business unit may have between 100 to 300 business functions. This is unmanageable for the task required for the model. It is necessary to concentrate on functions that are **critical to link** relations where **critical** means that the function exerts a great influence on success of the unit (similar to the concept of CSFs).

Figure 5: Business Functions in Customer Relations (adapted and simplified from Osterle, p.157)

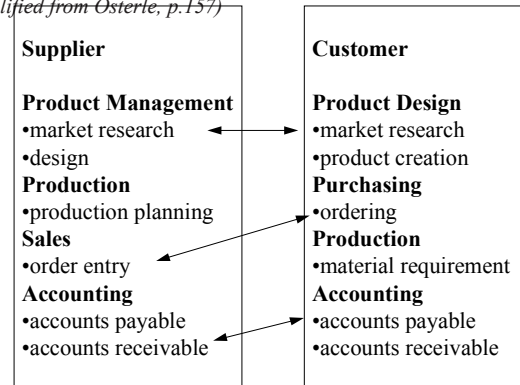


Figure 6: Typology of Information Technology (adapted from Osterle, p.160)

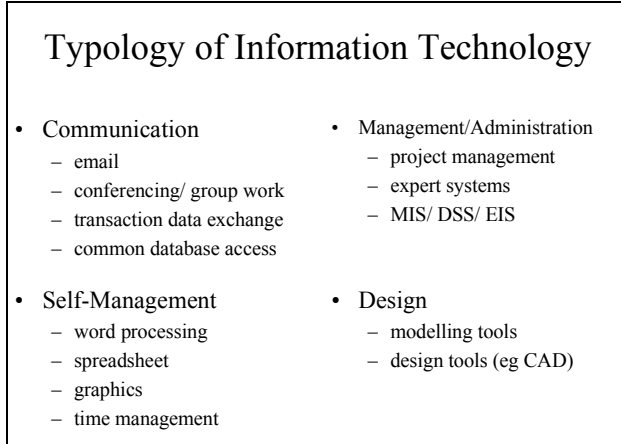


Figure 5 represents a simplified version of the actual processes identified by Osterle in a case study examining the relationship between a material provider (the supplier) and garment manufacturer (the customer). Business functions that are critical to relations between the businesses are listed. Links between the organisations are then highlighted by joining them with an arrow. For instance, there is a relationship between ordering (customer) and order entry (supplier).

**3.2.3.3 Combine Business Requirements with IT**

Each of the links identified in the initial step of the model are matched with a *Typology of Information Technology*. This summarises the technical possibilities at the stage preceding practical application. The following diagram represents a simplified version of the Typology of Information Technology.

Each link is compared with an item in the typology until a potential IT investment is identified. For instance, the *Order to Order Entry* link may find *transaction data exchange* (the automatic swapping of order data electronically) to be useful (Osterle).

**3.2.3.4 Other Steps**

Other steps in the model examine the feasibility of the IT investment.

**3.3 Strategic IT Model Summary**

Each of the presented models involves the application of three major steps in their operation (Burgess and Schauder, 1999).

**3.3.1 Step 1: Business Investigation: Identifying areas where IT can be useful**

This is typically the first step in any model. The business investigation is normally achieved by analysing CSFs, performing a SWOT analysis or analysing the business from a customer perspective (as per the value chain).

**3.3.2 Step 2: Determining the Strategy to be Adopted**

This is generally where proactive and/or reactive strategies are identified after the business investigation.

**3.3.3 Step 3: Identifying the Strategic IT Opportunity**

This is the stage where particular IT investment(s) are identified to match the strategies.

**3.3.3.1 Representing the Steps of the Models**

Most of the models have steps beyond the ones are represented in Table 1. For the purposes of this paper, the interest is only in those steps that result in the IT idea being formulated.

**4 ELECTRONIC COMMERCE MODELS**

The purpose of this section is to examine two models that currently exist to assist organisations to identify IT investments specifically in the electronic commerce field. The models propose a strategy that firms may follow in developing a web site from inception to implementation.

**4.1.1 Marchese (1998) - Web Development Model**

Marchese suggests a seven step approach to developing web sites.

**4.1.1.1 Kick Off**

In this first step, it is necessary to meet whoever is preparing the web site and decide what is really wanted. This allows the firm to define objectives, timelines and responsibilities (Marchese).

**4.1.1.2 Strategic Analysis**

Interview all of the people associated with the project. This ensures that all interested people have input. This group would include customers and employees. A technical analysis ensures that the project is within the capabilities of the firm (it can be managed and maintained).

A Competitive analysis is also important. Know what competitors are doing, understand why, understand how they are being perceived in the market place and understand how you are going to be perceived in reference to them (Marchese).

**4.1.1.3 Concept Development**

This involves mapping out thoughts into a conceptual architecture. It provides a road map for what the firm is thinking. The concept architecture becomes the information architecture. The information architecture supports the concept development. It is the information that makes that concept valuable to the user (Marchese).

**4.1.1.4 Prototyping**

Create a small scale model of the web site. This can then be shown to management and users and tested in formal and informal settings. It allows those parties to comment at an early stage, so that refinements can be made (Marchese).

**4.1.1.5 Site Execution**

This includes a number of steps, such as final site production, final content development, final useability analysis, quality assurance, documentation and staff training (Marchese).

**4.1.1.6 Launch and Beyond**

It is important that the web site is very dynamic: changing, growing, improving and evolving. Additionally, ensure that user feedback is being incorporated into site alterations (Marchese).

**4.1.2 AlMoumen and Sommerville (1999) – Marketing for Electronic Commerce**

AlMoumen and Sommerville (1999) have been concerned with developing a model that supports the analysis and specification of requirements for electronic commerce systems. The six stages of the model are:

1. *Select Applicable Principles.* Decide where the firm wishes to position itself in the marketplace (low cost, differentiation and/or niche).
2. *Define the Required Marketing Mix.* This is based upon where the firm wishes to apply its marketing principles to a particular market segment. This is based upon what AlMoumen and Somerville refer to as the 6-P's (Product, Price, Promotion, Place, People and Process). The first four "P's" are well known in marketing circles (Kotler et al).
3. *Analyse and Assess Existing Web Site.* This analysis occurs on the basis of four areas:

- *Intangibility.* The need for consumers to be able to evaluate the product and/or the level of provider skills and performance levels.
- *Separation between product/service and supplier.* The ability of consumers to actually contact someone within the company directly.
- *Heterogeneity.* The ability of consumers to be able to compare products and services of different firms when there are no standards for firms to present product or service information on the internet.
- *Perishability.* The ability of firms to make consumers aware of product and service information (especially 'specials') at a time and place when the consumer is looking for that information.

Even when a firm has not established a web presence, it is still a good idea for this analysis to occur on competitors' web sites.

Table 1: Comparing the Steps of each Model

Models	Step 1:	Step 2:	Step 3:
	Business Investigation	Determining Strategy	Identifying the IT Opportunity
Porter and Millar	Analyse Primary Activities	Assess Value Added	Transform the Value Chain or Change the Nature of Competition
Barton and Peters	Situational Factors	Genesis	IT Dependant Business Strategy
Osterle	Identify Business Requirements	Identify Business Requirements	Combine Business Requirements with IT

Table 2: Comparing the Steps of each Electronic Commerce Model

Models	Step 1: Business Investigation	Step 2: Determining Strategy	Step 3: Identifying the IT Opportunity
Marchese	Kick off Strategic Analysis	Concept Development	Prototyping Site Execution
AlMoumen and Sommerville	Select Applicable Procedures Analyse and Assess Existing Web Site	Define the Required Marketing Mix Summarise Site Features from a Marketing perspective	Compare with Good Practice Guidelines Report on Changes or Redesign of Electronic Commerce Site

4. *Summarise Site Features from a Marketing Perspective.* Summarise how the existing web site matches the marketing mix identified in step 2.
5. *Compare with Good Practice Guidelines.* Compare the web design with a set of good practice guidelines (at the time of publication, the authors had not developed these guidelines).
6. *Report on Changes or Redesign of Electronic Commerce Site.* Recommend changes to the current site, a complete redesign of a new site, or features to be implemented in a proposed site.

**4.2 Electronic Commerce Model Summary**

In order to compare the steps of these models with those of the models in the previous section, the following table is presented, which represents the separate components of each model and breaks them down into business investigation, determining strategy and identifying the IT opportunity.

Each of the e-commerce models presented here follow a similar sequence of steps as outlined. Where they are lacking is in the provision of sufficient detail to explain how they operate and a better explanation of how each step links with the next.

**5 SMALL BUSINESS USE OF THE INTERNET**

There are a number of key differences in the use of information technology between small and larger businesses. These include (Burgess, 1999):

- Small businesses generally have fewer resources available to devote to IT projects.
- Small businesses have very little control over forces that are external to the organisation.
- Small businesses generally do not have their own separate IT department.
- Small businesses generally have less formalised planning and control procedures. Often, the owner/ manager does not have the time, resources or expertise necessary for such tasks. Formal IT project evaluation and review procedures are seldom used.

Electronic commerce is seen as one of the methods that small businesses can use to compete with large businesses (DIST, 1998; Penhune, 1998). There are increased opportunities available for small businesses to find and retain customers (Viehland, 1998; Engler, 1999). The internet provides the means by which the reach of small businesses extends beyond their traditional markets (OECD, 1999).

One of the problems is that they cannot match the advertising budgets of larger counterparts. They also face the risk that a niche market they may currently operate in may become the target of larger businesses that may be looking to broaden their customer base (Evans, 1999). Small businesses have little time or resources to address potential changes to their current activities. Another problem is the availability of technical expertise to help them to take advantage of opportunities that may present themselves (DIST; Engler; Conhaim, 1999; Conroy, 1999).

The internet may, however, offer greater opportunities to smaller businesses to team with other smaller associated firms or as part of the supply chain of larger firms (Engler; Commonwealth of Australia). Portal sites are being set up to act as a mediator between small businesses and their vari-

ous customers and suppliers (Karpinski, 1999). This represents an alliance strategy.

There are a number of skills required to develop a web site, including interactive design, interface design, strategy design and technical skills. It is necessary to decide whether or not the firm acquires these internally or externally (Marchese). This is a big enough challenge for larger businesses to address, let alone small businesses. Small businesses can use the more inexpensive tools to create web sites that are less sophisticated than those of their larger counterparts (Fortune, 1999).

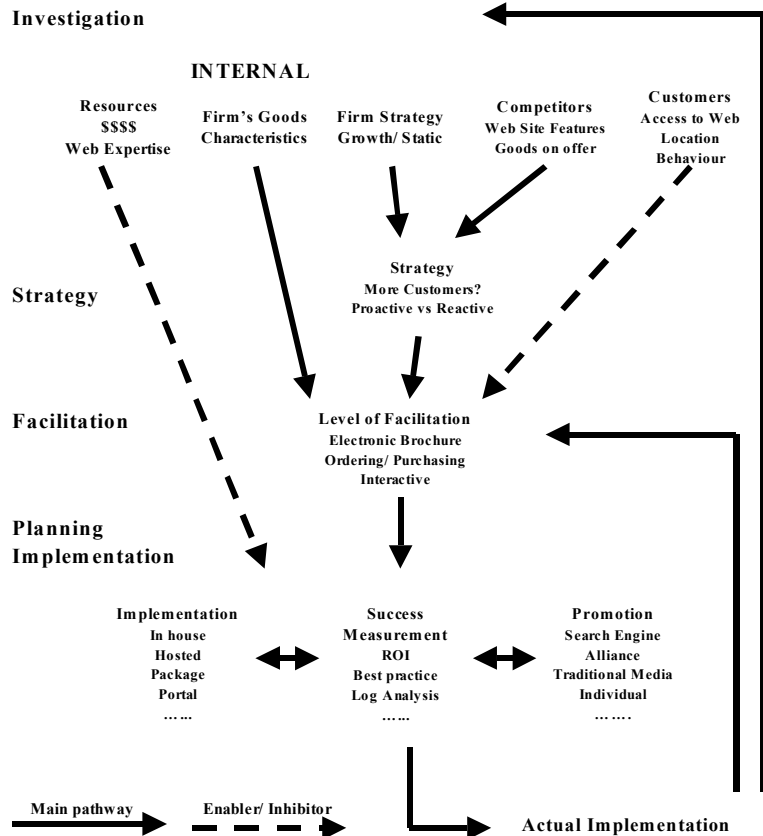
Summarising, the problems facing small businesses in relation to use of the internet are not that different conceptually than those they face in relation to the use of IT – problems with IT expertise and available resources (time and money).

**6 DEVELOPING BUSINESS-TO-CONSUMER INTERACTIONS ON THE INTERNET: A MODEL FOR SMALL BUSINESSES**

A model is proposed for small businesses in an area of electronic commerce, business to consumer interactions. This area has been chosen because it is seen as being the one of greatest interest to small businesses. The model has been based upon the major steps that were identified earlier in the examination of the models and other identified aspects of the small business literature. It represents an attempt to address the shortcomings of existing e-commerce models and the specific needs of small businesses.

The initial stage of the model, the business investigation, involves a reduced SWOT analysis. The firm's internal and (some) external resources are examined. Internally, the firm's resources in relation to time, money and expertise are examined, as well as the characteristics of the firm's goods and services. This is because different types of goods may be more suited to sale over the internet than others. The firm's overall strategy is

Figure 7: Business-to-Consumer Interactions on the Internet: A Model for Small Businesses



also examined, as a firm wishing to grow in size may require a more 'aggressive' web strategy than a firm that is satisfied with its existing customer base.

Externally, the web sites of competitors are examined, as well as the ability of customers to access the firm's web site (for instance, do they possess internet access?).

The firm's web site strategy is determined after competitors' web sites have been reviewed and the firm's overall strategy (growth?) has been considered. Will they be proactive (trying to gain an edge) or reactive?

Once the strategy has been determined, the firm can then consider the type of web site presence they desire. This is determined by the web site strategy, the available resources, the characteristics of the goods and/or services and the characteristics of customers. In determining the *Level of facilitation* the firm has a number of decisions to make. Will they introduce a plain electronic brochure site, where customers can read about products and services, find out about the firm and get basic product support? Will they introduce ordering and/or payment facilities? Will they introduce interactive features which allow customers to receive 'personalised' attention (but which is expensive)? Does the firm wish to introduce new features that are not on competitors' web sites, or will they just introduce 'industry standard' sites?

Once the firm has made these decisions, it can start to plan for the implementation of the site. Planning is made up of three areas:

- **Method of implementation.** The available resources and the expertise within the firm will determine this. Different levels of implementation from 'free' sites (that require advertising space on the firm's site) to individually customised sites (the most expensive) are available.
- **Promotion.** As the method of interaction with the customer is different, so is the method of promoting the web site. Traditional media (newspaper, magazines and so forth) can be used to advertise web sites, as can registration with search engines, alliances with other firms (for instance, to swap banner advertisements) and so forth.
- **Measurement of Success.** Some methods of review may be return on investment, comparing online sales with online costs. Where sales are not directly made over the internet, the firm may wish to use log file analysis tools to determine the level and source of traffic on the web site.

It is important to consider the method of promoting the web site and the method for evaluating success at the time of determining how to implement the site.

The feedback loops allow for the firm to reconsider minor design and implementation issues (in the short term) and a revisiting of the entire process (in the longer term). This feedback process is consistent amongst strategic IT projects.

## 7 TESTING THE MODEL

It is the intention of the authors to test and validate this model by presenting it to a focus group of small business consultants and follow up with a number of case studies of small businesses using the model to introduce their web site presence.

## 8 CONCLUSION

A number of models related to the use of IT to add value to products and services and models relating to the development of electronic commerce sites have been used as the basis for development of this model to help small businesses to develop business to consumer interactions on the internet. Application of the model could provide small businesses with the planning methodology that they often lack to review their internal and external resources and identify a basic web site strategy before attempting to develop their web site.

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