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Positioning of Industries in Cyberspace; Evaluation of Web Sites Using Correspondence Analysis

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ABSTRACT

In today's extremely competitive markets it is crucial for companies to strategically position their brands, products and services relative to their competitors. With the emerging trend in internationalization of companies especially SME's and the growing use of the Internet with this regard, great amount of attention has been turned to effective involvement of the Internet channel in the marketing mix of the companies. This has introduced a new term of market space (the Web) versus the traditional battleground of marketplace in which companies compete with each other. The growth of presence in the market space has been exponential, both in general and within specific industries.

Thus bringing to attention the importance of Web presence and that it is crucial for companies to strategically regard competition in market space. It is important to understand that positioning on the Net is very different and requires its own set of strategies as part of the new marketing paradigm. This study goes towards addressing the need to understand and measure the nature of positioning of company Web sites on the Internet. The aim of the study is to introduce a statistical technique to compare the positioning of Web sites, in and across industries.

With this regard a group of Web sites from the home appliances manufacturing industry was selected and the technique of correspondence analysis was applied to produce maps which can be studied and interpreted.

The results indicated that either based on company strategies or accidentally, these Web sites are positioned differently and may follow or affect different marketing policies of their owners. At the end, the implications of this technique for management and how it can be used by new home appliance manufacturers or those who want to compare their sites with the ones of their competitors, in order to benchmark and/or revise their policies and strategies have been discussed.

1. Introduction

As a developing country, Iran's economy has been constantly growing in the recent years. After the 1978 revolution in this country most of the heavy industries have been either shut down or taken over by the government. It wasn't until after the war with Iraq that wide privatization of industries has been started in different areas. Today the private sector is mostly focused in the mid-range industries where foreign and domestic competition is constantly growing. Government-owned industries are still monopolies in mostly strategic areas.

As the strict commercial boundaries of the country are starting to disappear, Iran's private industries are now facing new threats and opportunities in their fields of activity. Many are now facing the threat of the presence of well established foreign firms, and their well recognized brands in Iran's huge consumer market. After so many years of very limited international presence of these Iranian industries, many have also realized that considerable potentials exist to take the opportunity and expand their markets internationally.

Wide social reforms have also taken place in the recent years, which have turned the attention of Iran's mostly young population towards the use of the Internet. These young generations, which mostly live in larger, more modern cities create a large portion of many industries' domestic market, and them using the Internet, has brought to the mind of many marketers, the importance of Web presence.

Even though the Iranian marketers' perception of the Internet as an effective marketing channel, and their application of the medium in their marketing strategies is still in its infancy, many strong and weak attempts have been made to establish Web sites for companies and test the Internet's effectiveness as a marketing channel in Iran. What is mostly needed by these companies today is research in different areas of Internet marketing and models to describe and measure its effectiveness in real business environments.

In this research we will be trying to use methodologies available to evaluate and map Web sites of Iranian industries, so that it can be better understood that how strategies and competitions are forming in this country's cyberspace.

2. The Internet as a Marketing Tool

With a population of well over 900 million users worldwide and with a growth rate of more than 150% every five years (www.internetworldstats.com, 2009), the Internet is growing astonishingly and is being widely accessed across the globe.

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Before the introduction of the World Wide Web, the Internet was mostly the domain of scientists and academics with a complex interface based on the UNIX operating system. Today, the wide use of World Wide Web as the interface of the Internet and great achievements of hypermedia in creating a point-and-click environment has enabled easy adaptation and triggered a wide spread of Internet culture around the globe.

The emergence of Internet has helped the world move from the age of "automation technologies" to "information technology" (IT). One of the hottest concepts for online marketing is the WWW. It offers companies an easy, inexpensive, fast, and technologically sophisticated tool for advertising goods and services, taking and placing orders, promoting their philosophy and policy, and communicating with their customers all over the world. In the Web environment, a company can deliver a full presentation with sound, pictures and video to millions of potential consumers.

There are two ways in which a company can benefit from use of the World Wide Web. It can be used for information access only, or it can be actively used to set up a marketing presence (Ainscough & Luckett, 1996).

There are many potential advantages of effective Internet marketing: improved corporate image, improved customer and investor relations, finding new prospects (customers), increased visibility, cost reduction, market expansion, and improved internal communications (Sterne, 2001, Moan 2003, Jang, 2006).

Apart from successful branding, which can also be recognized in the cyber-market, it is difficult to determine the size of a company by its World Wide Web page. The Internet's relatively low entry barriers, including the irrelevance of company size enhance its attractiveness as a distribution channel. However, familiarity with reputation and brand names are seen to be increasingly important online (Melewar & Smith, 2003, Argyriou et al. 2006, Delgado et al. 2008). As a result brand awareness plays a major role in creating the critical factor of trust, when it comes to online purchasing.

3. The Internet: A New International Marketing Paradigm

Suggestively the Internet provides a fundamentally different environment for international marketing and therefore requires a different approach.

Businesses today compete in two worlds: the physical world of resources (marketplace) and the virtual world made of information (marketspace) (Rayport & Sviokla, 1995). In order for companies to be able to compete, they have to create value in a competitive way and discriminate from one another. But it is very important for them to realize that the processes for creating value are not the same in the two worlds, and in order for them to successfully compete in both worlds they face a new conceptual and tactical

challenge of managing two different value-adding processes in two mutually dependent environments.

The term 'value-chain' was first used by Michael Porter in his book "Competitive Advantage: Creating and Sustaining Superior Performance" (1985). The Value-Chain framework of Michael Porter is a model that helps to analyze specific activities through which firms can create value and competitive advantage (Figure1).

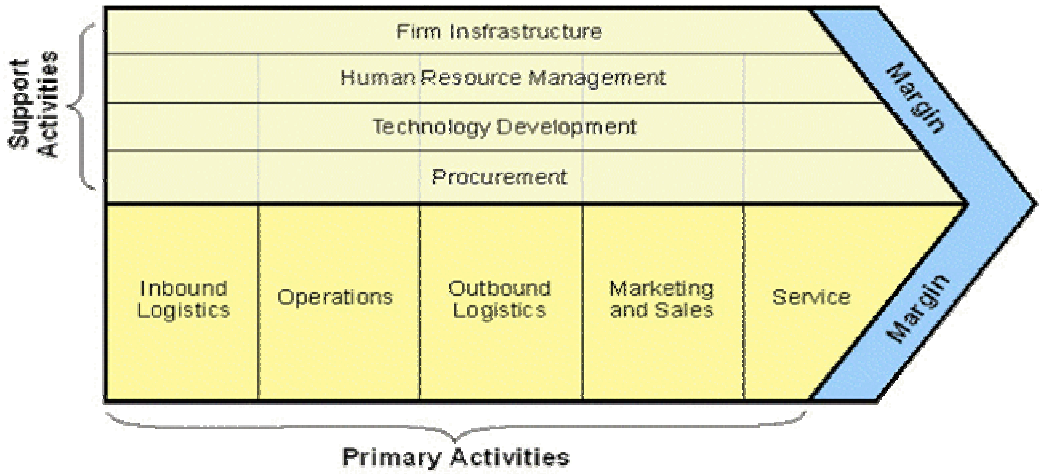

Fig. 1. Porter's Value Chain Mode

By definition, the value-chain model describes a series of value-adding activities, connecting a company's supply side (raw materials and inbound logistics) and production processes with its demand side (outbound logistics, marketing and sales). In this model, information is treated as a supporting element for design and creation of value-adding processes by companies, and not as a source of value itself. In market space or virtual value-chain information is a source of value for the customers (Eid et al., 2002). Federal Express for example, has created added value for the customer by providing a free package-tracking service through the World Wide Web, using the information available in the company as the source of value.

This is another aspect of the paradigm shift, with which FedEx has been able to strategically increase customer loyalty in a fiercely competitive market.

Another aspect of the paradigm shift is caused by the ultimate power that the Internet puts in the hands of the customers by enabling them to demand the best products at the lowest prices.

This paradigm shift is described with the term, "consumer-to-business" marketing (Urban, Sultan, & Qualls, 2000, Castaneda, et al. 2009). Also agreeing, Rayport and Sviokla (1995) draw attention to replacing supply and demand. They said that in today's world of overcapacity, in which demand, and not supply, is scarce, managers must increasingly look to demand-side strategies.

Overall, average profitability is under pressure in many industries influenced by the Internet, so it becomes all the more important for individual companies to set themselves apart from the pack (Eid et al., 2002). The only way to do so is by achieving a sustainable competitive advantage. Sustainable competitive advantage can be achieved in two ways. One is *operational effectiveness*, which is doing the same things that your competitors do but doing them better. With a look at Porter's value-chain (Figure 1) it can be seen that operational effectiveness advantages can be created by using or developing better technologies, superior inputs, better trained people, or even a more effective management structure. The other way to achieve sustainable competitive advantage is *strategic positioning*, which is, in contrast with operational effectiveness, doing things differently from the competitors, in a way that delivers a unique type of value to the customers (Eid et al., 2002). This can mean offering a different set of features, a different array of services, or different logistical arrangements.

Undoubtedly, the Internet affects both operational effectiveness and strategic positioning, but in very different ways.

It makes it harder for companies to sustain operational advantages, but it opens new opportunities for achieving or strengthening a distinctive strategic positioning (Eid et al., 2002).

The very rapid and comparatively low cost advances in information technology have made it possible for companies to develop new services and offerings. But through the Internet companies can easily monitor each other's activities and once one company establishes a new best practice, its competitors tend to imitate it quickly. In such an environment, best practice competition eventually leads to competitive convergence, with many companies doing the same things in the same ways. What happens then is that customers end up making decisions based on price, narrowing profits in the industry.

Therefore Porter (2001:72) has stated that:
"Strategic positioning involves the configuration of a tailored value chain (the series of activities required to produce and deliver a product or service) that enable a company to offer unique value. To be defensible, moreover, the value chain must be highly integrated. When a company's activities fit together as a self-reinforcing system, any competitor wishing to imitate a strategy must replicate the whole system rather than copy one or two discrete product features or ways of performing particular activities".
Take Dell for example. Dell's online direct-sales channel and strategic use of the Internet to manage and operate its supply chain has been studied in almost every business school around the world, and with no doubt has been closely monitored by its competitors. By the degree of success that Dell has achieved in strategically positioning itself and targeting different market's segments with its perfectly crafted value-chain, one can be certain that many of Dell's competitors had dreamt, and may have indeed tried to copy this business model.
But the fact is that by just selling laptops online you can't create another Dell, but the entire system has to work like Dell's.
Consequently, as it becomes harder to sustain operational advantage, strategic positioning becomes all the more important (Eid et al., 2002).

4. The Research

There has been a lot of research done in evaluation of Web sites in different areas since late 1990s. The areas in which most studies have been conducted include topics such as "objective measurement of Web site effectiveness", "types of products and services likely to sell over the Internet", "concepts of marketing on the Internet", "international aspects of Internet marketing", "cultural aspects of Internet marketing", and many more. But with the exception of a few notable papers, very little attention has been paid to research in definition of frameworks in which Web sites can be evaluated and compared in and across industries.
The current research includes several stages. First, key elements of Web site effectiveness were chosen from the literature on different aspects of Internet marketing. Second, a rating method was introduced to evaluate Web sites in each of the dimensions selected in the first stage. Third, a sample of Web sites was chosen from a given industry, and each Web site was rated using a questionnaire developed in stage two. Finally, the gathered data was graphically represented using the application of correspondence analysis, interpreted and discussed.

5. The Chosen Industry

As a developing country, Iran's industries are rapidly growing in different areas, plus new plants are constantly popping up around the country. Out of many industries available, the industry chosen for this research is the manufacturers of home appliances. This sector of the Iranian industries was selected for a number of reasons. These included:

- There is no government dominance in this industry. Even though there are government relations in some companies active in manufacturing home appliances and their import and export, the size of operation and market share of these companies are not different from their private counterparts.
- According to the Iranian law, there are no special barriers for import and export of these goods.
- Competition in this industry is significant, and companies are used to competing with local and foreign rivals in the market.
- The companies active in this industry are mostly mature and with years of experience can have a glimpse at the foreign markets (usually in the Middle East) as well.
- Many of these companies have created joint ventures with foreign companies to broaden their product mix, and expand their market share both domestic and internationally.
- Home appliances products are more or less the same with similar functionalities and companies' competitive advantages usually depends on the sort of relationship they have with the customers and how they can communicate their products' special features or their provided services across.
- With a mostly young target market, the Internet is slowly becoming a new ground for these companies' rivalry.
- After many years of isolation from the international markets, the Internet would be a great opportunity, and a cost-effective solution for the Iranian private industries to expose themselves internationally.

6. Sample Frame and Sample

Having chosen the home appliances manufacturers as the industry in which the research is being conducted, and also considering the focus of the research in Iran and the Internet aspects of marketing, the population would be Iranian home appliances manufacturers with a presence on the Web. The sample frame was the companies present in the 4th International Exhibition of Household Appliances held in Tehran in 2005.
The guide-book containing all of the participating companies in the fair, was purchased at the fair, and provided enough information about their offerings as well as contact information and Web site addresses (if available). Out of many companies listed in the guide-book, only the ones which had a Web site address available were selected and then based on their business type (manufacturers only), size and brand

recognition, a group of twenty companies were picked out.

In order to make sure that these companies were using their Web sites strategically and the Web address wasn't just listed for future use or just a "show off", these twenty companies were interviewed during the fair and asked the question if they had an IT department or at least a contact person inside or outside of the company responsible for their Web site. A list of eight companies listed in the following table (Table 1), was the result, which was used as the research sample.

Tab. 1. Research Sample (a)

Company Name	Web Site Address
Akhgar Co.	www.akhgar.com
Polar Co.	www.polar.ir
Energy Industries	www.energy-ind.com
Sinjer Co.	www.sinjer.com
Saiwan Co.	www.saiwan.com
Faragaman Co.	www.faragamanco.com
Behi Co.	www.behico.com
Alooni Group	www.aloonigroup.com

7. Dimensions of Web Site Evaluation

Based on a vast literature available in factors of effective Website design and considering the major categories of Website characteristics; *interactivity of a Web site interface, navigability, multimedia design,* and *marketing communication content*, the following table (Table 2) is suggested containing the factors against which the mentioned Web sites will be evaluated in this study (Karayanni &.Baltas 2003).

Tab. 2. Website Evaluation Criteria

Criteria	Sub-Element
Company related information	Company history
	Financial status of the firm
	Company news and plans
	Employee profiles and CVs
	Public relations material
Multilingual functionality	At least two languages
	More than two languages
Product information and services	Online brochures and catalogs
	Product price lists
	Online ordering capabilities
	Online purchasing capabilities
	Customized offerings
Customer-related information exchange	Collection of customer feedback
	Customer support and FAQ
	Structured online surveys
	Announcements of promotion activities
	Exposition of customer cases
Use of graphics and multimedia design	Clever and impressive use of video, audio and graphics
	Loading speed of the Site
Navigability	Availability of site index
	Search facilities
	Site maps
	Personal contact possibilities
Keeping customer databases	Customers' subscription
	Customers' login
	Online clubs and forums

8. Correspondence Analysis: An Introduction

Correspondence analysis is a geometric technique for displaying the rows and columns of a two-way contingency table as points in a low-dimensional space, such that the positions of the row and column points are consistent with their associations in the table. The goal is to have a global view of the data that is useful for interpretation.

The main output from a correspondence analysis is a graphical display that is a simultaneous plot of the rows and columns of a contingency table in a space of two or more dimensions The number of dimensions needed for a perfect representation of a contingency table is determined by the minimum of (number of rows-1) and (number of columns-1). The mathematical procedures involved in correspondence analysis are complex. References can be made to Greenacre (2006,2007) for technical details. What is of concern in this research paper is the practical application and interpretation of correspondence analysis rather than the mathematical and statistical details.

9. Research Design

The literature surrounding the concepts of Web site characteristics evaluation and correspondence analysis don't clearly mention the kind of expertise a group of respondents should have when conducting a research in this regard. However, in order to achieve maximum precision in the results of this study, it is essential to take into account business, marketing and technical perspectives, when evaluating the Web sites. For this purpose, a group of 25 people with different technical and managerial expertise have been selected.

In order to evaluate the Web sites of the eight companies selected as the research sample, a structured interview was designed.

For this interview, a separate questionnaire form for every one of the Websites was created listing the criteria concerned for Web site evaluation. For every criterion in the form two or more sub-elements were included in order to make the respondents understand the scope of the criteria and therefore perform a reasonable judgment on the Web sites. A total of twenty six elements were mentioned on every form. The relative importance of criteria and sub criteria was considered the same, because of using the contingency table data as input data in the correspondence analysis.

Every sub-element can then be rated as *"None/Bad"*, *"Fair"*, or *"Good"*. For the purpose of this research, not having a sub-element (*None*) or having a poor or none-functioning resemblance of a sub-element (*Bad*) would be of the same value, since it clearly shows that the designers of the Web site hadn't considered that element as a strategic function. It was decided that two points would be given for every *"Good"* vote, one point for every *"Fair"* vote, and none for *"None/Bad"* votes. These points are then added up to have a maximum score, mentioned in the following table (Table3), for every required criterion of Web site evaluation.

Tab.3. Web site Evaluation Criteria Scores

Criteria	Sub-Element	Max Score
Company related information	1. Company history 2. Financial status of the firm 3. Company news and plans 4. Employee profiles and CVs 5. Public relations material	10
Multilingual functionality	1. At least two languages 2. More than two languages	4
Product information and services	1. Online brochures and catalogs 2. Product price lists 3. Online ordering capabilities 4. Online purchasing capabilities 5. Customized offerings	10
Customer-related information exchange	1. Collection of customer feedback 2. Customer support and FAQ 3. Structured online surveys 4. Announcements of promotion activities 5. Exposition of customer cases	10
Use of graphics and multimedia design	1. Clever and impressive use of video, audio and graphics 2. Loading speed of the Site	4
Navigability	1. Availability of site index 2. Search facilities 3. Site maps 4. Personal contact possibilities	8
Keeping customer databases	1. Customers' subscription 2. Customers' login 3. Online clubs and forums	6

The maximum scores given by the respondents are the raw data which are extracted by examining the forms. These scores will then be added up to create the *contingency table*.
The resulted contingency table is then used to illustrate a two-dimensional map using Correspondence Analysis.

10. Results

The questionnaire forms were printed in eight-sheet sets in order to be handed out to the respondents. The respondents were then interviewed one by one, (some in person and some over the phone) explaining the way they are required to fill the forms. They were asked to examine each Web site and based on their perception, rate the site by placing a check mark under the corresponding option. The respondents were asked to return the forms at a later time, when they had finished examining all of the eight Web sites.

As mentioned previously, a group of eight companies were selected as the research sample. However during the timeframe in which the respondents were asked to examine and fill out the questionnaires, Alooni Group's Web site was shut down for maintenance. Therefore the research sample used was reduced to seven. In the intended time frame, twenty respondents out of the twenty five respondent to whom the questionnaires were sent, had returned the questionnaires, and since the amount of data was sufficient to conduct the analysis the raw data was extracted from the available forms.

Contingency Table
Portraying the rates given by the respondents for every Web site, under every criterion, the following table (Table 4) is created to be used as the contingency table in Correspondence Analysis.

Tab.4. Contingency Table (a)

	CRI	MLF	PIS	CIE	GMD	N	CD
Behi	5	0	26	10	44	34	0
Energy	59	0	30	21	45	35	1
Sinjer	50	4	28	14	51	54	42
Akhgar	62	2	65	36	36	35	58
Polar	86	33	99	71	38	58	35
Saiwan	51	70	40	40	34	30	0
Faragaman	14	31	38	45	35	34	0

The abbreviations at the top of the contingency table stand for the following criteria:

- CRI: Company Related Information
- MLF: Multilingual Functionality
- PIS: Product Information and Services
- CIE: Customer-related Information Exchange
- GMD: Graphics and Multimedia Design
- N: Navigability

CD: Customer Databases
The Analysis

The statistical software used for performing the calculations is MINITAB 14. In this version of MINITAB, after providing the contingency table in the Worksheet, Correspondence Analysis can be perform by selecting "Simple Correspondence Analysis" from "Multivariate" sub-menu, under the "Stat" menu.
In order to conduct the correspondence analysis on the available data, the first step is to establish whether there is dependency between the rows and the columns (attributes and company Web sites). For this a Chi-square analysis of the data has been performed (test of independence or homogeneity). Assuming the amount of $\alpha = 0.01$, the question to be answered is; Does the sample provide sufficient evidence to conclude that the two attributes, Web site characteristics and companies, are dependent?
For this the null and alternative hypotheses would be stated as follows:

- H_0: Companies and Web site characteristics are independent
- H_1: Companies and Web site characteristics are dependent

The MINITAB output noted that the value of the test statistic Chi-square is 497.740. The critical value of Chi-square for $\alpha = 0.01$ and $df = (7-1)(7-1) = 36$ is 58.619. Because the value of the test statistic ($x^2 = 497.740$) is greater than the critical value of $x^2 = 58.619$ and it falls in the rejection region, the null hypothesis would therefore be rejected. Consequently, it can be concluded that the data confirms evidence of strong dependency between the Web site characteristics and companies.
The second step is to decide upon the number of dimensions to retain for further analysis. Table 5 provides the inertia report required for this decision.

Tab. 5. Analysis of Contingency Table

Axis	Inertia	Proportion	Cumulative	Histogram
1	0.1580	0.5487	0.5487	
2	0.0757	0.2631	0.8118	
3	0.0261	0.0907	0.9025	
4	0.0238	0.0826	0.9851	
5	0.0028	0.0097	0.9948	
6	0.0015	0.0052	1.0000	
Total	0.2879			

The first and second dimensions (Axis 1 and 2) account for 54.88% and 26.29% of the inertia, respectively. Together they account for 81.17% of the inertia. This can also be clearly observed from the *histogram* column of Table 5 that the first two axes should provide enough accuracy to describe the data in two-dimensions. Thus, for further analysis, a two-dimensional solution would be sufficient.

Correspondence Perceptual Map

The final step is to create a perceptual map to show relative distances of dimensions from the centroid in a graphical way. This way, explanation of differences and similarities between the observed values can be easily done by studying the Correspondence Perceptual Map (Figure2).

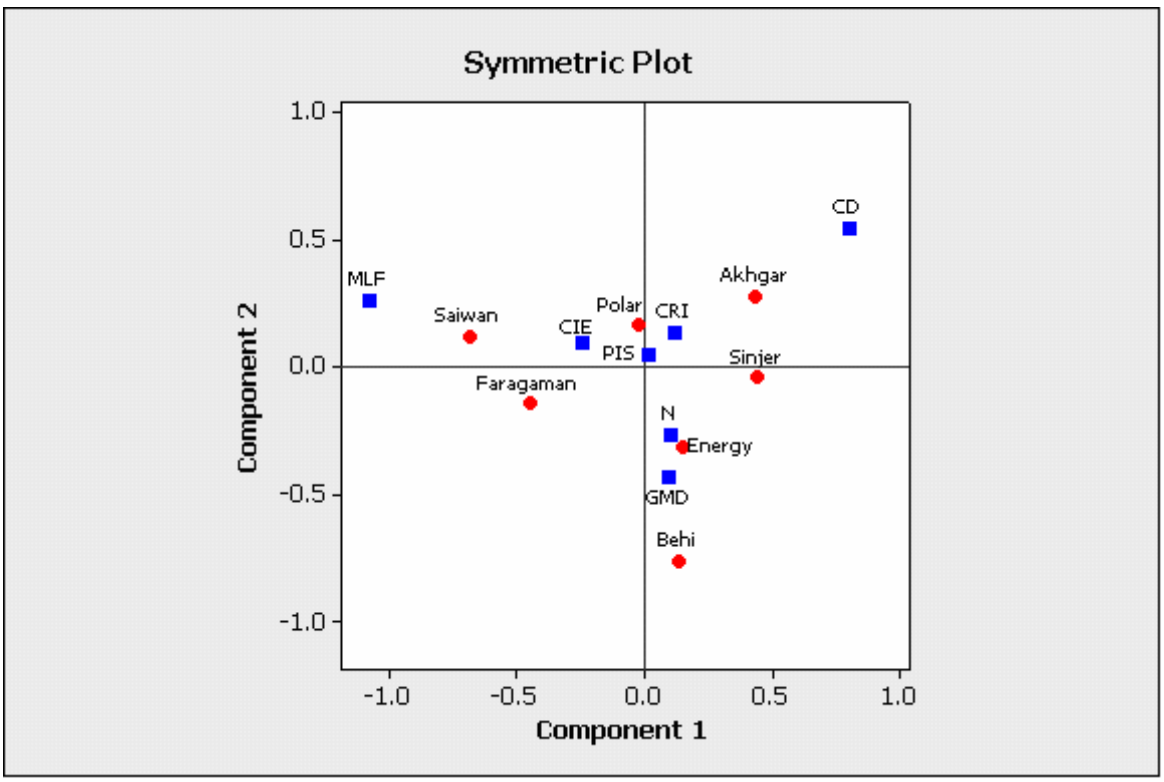

Fig. 2. Correspondence Perceptual Map

Tab. 6. Row Contributions

	Component 1			Component 2		
Name	Coord	Corr	Contr	Coord	Corr	Contr
Behi	0.134	0.027	0.008	-0.760	0.883	0.524
Energy	0.146	0.078	0.015	-0.312	0.359	0.142
Sinjer	0.442	0.708	0.174	-0.037	0.005	0.003
Akhgar	0.434	0.678	0.203	0.281	0.283	0.177
Polar	-0.021	0.008	0.001	0.172	0.515	0.094
Saiwan	-0.684	0.893	0.454	0.121	0.028	0.030
Faragaman	-0.449	0.702	0.146	-0.141	0.069	0.030

As discussed above a two dimensional map will be 81.17% accurate. Therefore by examining Figure 2 we can sketch a realistic perspective on the positioning attributes of these different Web sites.

This part of the study involves studying the absolute magnitudes and the signs of the coordinates for the attributes and the home appliances manufacturers that are to be found in Tables 6 and 7.

Tab.7. Column Contributions

	Component 1			Component 2		
Name	Coord	Corr	Contr	Coord	Corr	Contr
CRI	0.117	0.102	0.016	0.137	0.139	0.047
MLF	-1.076	0.893	0.594	0.265	0.054	0.075
PIS	0.015	0.004	0.000	0.051	0.050	0.007
CIE	-0.243	0.457	0.051	0.094	0.069	0.016
GMD	0.096	0.044	0.010	-0.431	0.887	0.401
N	0.105	0.118	0.011	-0.261	0.733	0.146
CD	0.798	0.624	0.317	0.545	0.291	0.309

Those with large coordinates, positive or negative, play a significant role in determining the dimension and thus its interpretation. The dimensions are purely numerical scales that are produced to show relative distance from the centroid in a graphical way.

11. Discussion

For dimension 1, analysis of the company coordinates (see Table 6, column: component 1, coord) reveals three distinct groups. First, Akhgar and Sinjer which both have 'large' positive coordinates and therefore form a clear group. Second, Saiwan and Faragaman with 'large' negative coordinates forming another distinct group. Third, Behi and Energy with 'small' positive coordinates plus Polar which falls slightly into the negative area, form another separate group.

In terms of the Web site characteristics mapping onto dimension 1 (see Table 7, column: component 1, coord) we can form four separate groups. The first group comprises characteristics that have a small positive coordinate, and includes CRI *'Company Related Information'*, PIS *'Product Information and Services'*, N *'Navigability'*, and GMD *'Graphics and Multimedia Design'*.

The other three characteristics each have a different coordinate attribute and therefore will create three different groups of one characteristic each. Groups two, three and four would be, MLF *'Multilingual Functionality'* with a large negative coordinate, CD *'Customer Databases'* with a large positive coordinate and CIE *'Customer-related Information Exchange'* with a small negative coordinate.

In this dimension, it can be observed that company-group 3 and characteristics-group 1 best match each other. Thus it can be noted that providing product information and an attractive, navigable site design have been valued by most of the companies. Also one can argue that multilingual functionality, customer databases and to some extent, customer-related information exchange haven't been generally viewed as common strategic characteristics of Web sites. This may project the fact that attempts to move away from the "online brochure" idea of Web site design haven't been realized or carried out successfully by marketers of the home appliances manufacturing companies.

For dimension 2, analysis of the company coordinates (see Table 6, column: component 2, coord) reveals that companies are more dissimilar in this dimension. Nevertheless in order to discern distinct groups, five groups can be outlined. The first group is Behi with a 'very large' negative coordinate. Far enough from Behi stands Energy which will again on its own, define group two of this dimension with a 'large' negative coordinate. The third group with 'small' negative coordinate comprises Faragaman and Sinjer. In contrast, the fourth group, Polar and Saiwan, both have 'small' positive coordinates. And fifth, once again a single-member group of 'large' positive coordinates, is made up of Akhgar.

In terms of Web site characteristics mapping onto dimension 2 (see Table 7, column: component 2, coord) the major differentiations are between two groups. The first group holds CRI *'Company Related Information'*, PIS *'Product Information and Services'*, and CIE *'Customer-related Information Exchange'* with small positive coordinates, and the second group comprises N *'Navigability'* and GMD *'Graphics and Multimedia Design'*. Once again, CD *'Customer Databases'* and MLF *'Multilingual Functionality'* stand out, creating two single-member groups in this dimension.

One significant observation, resulting from analysis of the coordinated in this dimension, is that it can be clearly seen that Energy, specifically relates to the second group of We site characteristics, and Polar is the best company associated with the first group. Thereby we can witness a clear example of how two Web sites have positioned differently on the Web.

Combining the two dimensions (see figure1) reveals further insights. Home appliances manufacturers that are positioned close to one another have similar

profiles with respect to the seven Web site characteristics. A glance at the plot brings to attention that Web sites are not positioned very close to each other and that each one has a unique tendency towards one, two or three of the seven characteristics based on which the study has been set. This might suggest that, in terms of online positioning, these companies either have developed completely different interests, or benchmarking of their sites against the best-practice Web sites in order to strategically position themselves, hasn't been performed by most. With a little optimism, Energy and Behi form a distinct group, both scoring positive on Component 1 and negative on Component 2 (even though Behi scores much lower on Component 2). On the other hand, Polar, Akhgar and Sinjer cluster together forming another group. In this group, all three Web sites score very close to the area of the map which corresponds to the positive values of Component 1 and Component 2. Saiwan and Faragaman, both stand out as individual groups because their scores clearly differ from each other and all the other Web sites.

The clustering of Web sites close to each other explains similar positioning on the Internet. This means that, with regard to Internet marketing, Web sites have to consider other Web sites positioned in the same cluster as their main 'online' competitors, or may have to reposition themselves on the Net if their rivals have different (better) positioning strategies. It is also very good for companies to benchmark their Web sites according to the other Web sites in the same cluster, or based on the better performing ones in their industry.

The Web site attributes form four groups. First, scoring positive on both dimensions (Component 1 and Component 2), *Company Related Information* (CRI) and *Product Information and Services* (PRI), plus *Customer-related Information Exchange* (CIE) which scores positive on Component 2 with a small negative value on Component 1 lay close to each other, thus form a group. Second, *Navigability* (N) and *Graphics and Multimedia Design* (GMD) both have negative values on Component 2 and positive values on Component 1 and therefore create another group. *Customer Databases* (CD) and *Multilingual Functionality* (MLF) both stand far apart from the rest of the Web site characteristics and therefore form an independent single-member group each.

It is hereby interesting to observe the relationship between navigability and design (GMD and N) and how they have been distinguished from the other group which includes mostly information-exchange oriented attributes (CRI, PIS and CIE). This indicates that designers might have to sacrifice information exchange for design and ease of use in the Web sites, and vise versa. In other words, the more information is exchanged on a Web site, the more complex and less navigable it becomes. Another interesting fact understood from the plot is that *multilingual functionality* and *customer databases* are two independent attributes which do not have similar profiles with any of the other Web site characteristics.

Further examination of the Correspondence Analysis plot shows which home appliances manufacturing companies are associated with which Web site characteristics. Again Web sites that are positioned close to one another have fairly similar profiles with respect to the various attributes. Thus, companies in group one (Energy and Behi), sit relatively close to *Navigability* (N) and *Graphics and Multimedia Design* (GMD). This means that compared to the other Web sites in this study these two are the best designed and easiest to navigate Web sites. Clearly Energy performs better than Behi in case of these two attributes. In contrast, companies in group two (Polar, Akhgar and Sinjer) tend to place relatively more emphasis on *Company Related Information* (CRI) and *Product Information and Services* (PIS).

Finally, it is very interesting to study the map further regarding the 'best' companies associated with different attributes. In this regard, Polar is best related to *Company Related Information* (CRI), *Product Information and Services* (PIS) and *Customer-related Information Exchange* (CIE) attributes. Thus performing best on information exchange attributes when compared with the other six companies studied here. Further more; Behi is relatively the closest Web site to *Navigability* (N) and *Graphics and Multimedia Design* (GMD) therefore is elected as the finest designed and easiest to navigate Web site among the others. In case of *Customer Databases* (CD), Akhgar has scored best. This is because Akhgar is the only company that has created forums and maintains customized profiles its customers. And finally, Saiwan is the only company who has performed best regarding *Multilingual Functionality* (MLF). It is interesting to know that Saiwan is the only Web site out of the lot which also supports Arabic other than Persian and English languages, which indicates that this company is clearly targeting the potential and easy-to-reach Arabic-speaking markets surrounding Iran's Western and Southern borders.

12. Conclusion and Implications

In this research, by understanding the very different natures of marketing and positioning strategies on the Internet versus the real world, and that how the Internet has defined a new marketing paradigm with its exclusive characteristic, we applied Correspondence Analysis to inspect how different companies are relatively positioned on the Internet with respect to key dimensions of effective Web sites.

The technique was used to illustrate the relative positioning of home-appliances manufacturers in Iran, enabling the observation of how these companies vary in terms of positioning in Cyberspace. This can be extended to other types of Web sites, offering different products and services. This type of analysis could be of help to a number of different parties. First, to new

home appliances manufacturers preparing to establish a Web presence, such an analysis could help position their sites in relation to their market offerings and strategies or relative to their most apparent competitors. Second, to companies wishing to compare their Web sites to those of competitors, this would provide insight into whom they 'cluster' with and areas of improvement. Especially when companies are concerned about international competitors when the most significant or only battleground is the Internet, it would be a great advantage to be able to compare and improve their Web sites as a crucial competitive advantage.

Finally, to companies wishing to benchmark their Web sites with those of 'best practice' in other industries. Of course it would be very informative if a group of home appliances manufacturers' Web sites were compared with and benchmarked against best-practice Web sites from other industries.

13. Limitations

It is important to remember that in correspondence analysis, positions are always relative. Thus, a company (X) can appear close to a particular attribute (A) even when in absolute scoring another company (Y) may achieve a higher score on the attribute. This is because company X scores higher on that particular attribute *relative* to its scoring on the other attributes in the focal attribute set. Many of the companies included in this study have outsourced their Web site design completely while their IT departments are only established to maintain and administer the sites besides the company IT infrastructure. This may affect the study in a way that Web sites may not exactly reflect the strategies of the companies.

Instability of Internet connections' quality has caused some misjudgment on attributes such as downloading speed of a site. Also, a couple of changes made to some web sites during the study may have caused inaccuracy in the relative scores in a few cases.

References

[1] Argyriou, E.; Kitchen, P.J.; Melewar, T.C.,. The relationship between corporate websites and brand equity - A conceptual framework and research agenda. International Journal of Market Research. Volume: 48, 2006, Issue: 5,pp. 575-599.

[2] Ainscough, T.L., Luckett, M.G., T*he Internet for the rest of us: marketing on the World Wide Web*. Journal of Consumer Marketing, 13(2):pp. 36-47.

[3] Castaneda, J.A.; Rodriguez, M.A.; Luquie, T.,. Attitudes' hierarchy of effects in online user behaviour . On line Information Review. Volume; 33. 2009, Issue: 1, pp. 7-21.

[4] Delgado-Ballester, E.; Hernandez-Espallardo, M., Building online brands through brand alliances in internet. European Journal of Marketing Volume: 42 Issue: 9-10 : 2008, pp. 954-976 .

[5] Eid, R., Trueman, M.,. *The Internet: New International Marketing Issues.* Management Research News, 25(12): 2002, pp. 54-67.

[6] Greenacre, M., Balsius, J., *Multiple Correspondence Correspondence Analysis and Related Methods*, Chapman & Hall, 2006..

[7] Greenacre, M., *Correspondence Analysis in Practice*, Second Edition, Chapman & Hall, 2007..

[8] Jang, S.C., Hu, C.; Bai, B.,.A canonical correlation analysis of e-relationship marketing and hotel financial performance. Tourism and Hospitality Research Volume: 6 Issue: 4 : 2006 , pp. 241-250.

[9] Karayanni, D.A., Baltas, G.A., *Web site characteristics and business performance: some evidence from international business-to-business organizations.* Marketing Intelligence & Planning, 21(2): 2003, pp. 105-114.

[10] Melewar, T.C., Smith, N., *The Internet revolution: some global marketing implications*. Marketing Intelligence & Planning, 21(6): 2003, pp. 363-369.

[11] Moen, O., Endresen, I., Gavlen, M.,. Executive insights: Use of the Internet in international marketing: A case study of small computer software firms. Journal of International Marketing, Volume: 11 Issue: 4: 2003, pp. 129-149.

[12] Porter, M.E., *Competitive Advantage: Creating and Sustaining Superior Performance*. The Free Press., 1985.

[13] Porter, M.E..,"Strategy and the Internet." Harvard Business Review 79 (3), 2001, pp. 62-78.

[14] Rayport, J.E., Sviokla, J.J., *Exploring the Virtual Value Chain*. Harvard Business Review, 73(6): 1995, pp. 75-85.

[15] Sterne, J., *World Wide Web Marketing: Integrating the Internet into Your Marketing Strategy*. New York: John Wiley, 2001.

[16] Urban, G.L., Sultan, F., Qualls, W.J.,. *Placing Trust at the Center of your Internet Strategy. Sloan Management Review*, 2000, 42(1): pp. 39-48.

[17] www.internetworldstats.com. 2009. Internet World Status.