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COMPETITIVE ANALYSIS OF CRM STRATEGIES USING ANALYTIC HIERARCHY PROCESS

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ABSTRACT

In the era of increasing need for customer-centric marketing, the growth of technology such as the Web-based customer relationship management (CRM) has enabled pharmaceutical firms to develop new capabilities to sustain competitive advantage with superior marketing strategies, which include formulating unique, direct relationships with customers. To compete by integrating the online technologies across all aspects of a firm's operations, translates into the need for developing new skills as traditional ways of competing become insufficient. Towards this end, pharmaceutical firms have seized the opportunity to institute relationships with customers (physicians and patients) with the use of the Web. Our research focused on developing a technique that would allow for benchmarking Web-based CRM strategies of firms in any industry. We used the US pharmaceutical industry as a setting to demonstrate how our technique can be used to avoid the typical blind spots of competitor analysis. We used a method called Analytic Hierarchy Process (AHP) to analyze seven firms, selected by executives from the pharmaceutical industry, to compare their Web-based CRM strategies. Results suggest that three of the seven firms were far ahead in the adoption of the Web related to the CRM. One had more focused efforts in patient relationship where as another had a very high focus on physician relationship. The proposed technique can be utilized for competitive analysis in any industry. Implications and future research directions have been discussed.

***Keywords:** Competitive Analysis, Multi-criteria Decision Method, Pharmaceutical Industry, Web-based CRM Strategies.*

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INTRODUCTION

The concepts of competitor analysis and competitive intelligence have been discussed in both strategic management and marketing literature for more than three decades (Chen, Su, and Tsai, 2007; Amit, Domowitz and Fershtman, 1988; Chen, 1996; Baum and Korn, 1996). One key issue of this discussion is to avoid 'blind spots' that may arise in the process of monitoring known and potential competitors (Zahra and Chaples, 1993). This monitoring allows a firm to anticipate future competitive moves. In addition, firms conduct competitor analysis to gauge the future position of the competitor rather than current resources and positions, and as such focus on a competitor's resourcefulness (Hamel and Prahalad, 1989; Hopkins, 2003). While competitive intelligence is deemed important in managerial decision making (Porter, 1980; Smith, Ferrier and Ndofor, 2001), in the present paper, we extend the idea of the competitor analysis for a set of known competitors. Specifically, we examine how Customer Relationship Management (CRM) strategies could be used to create competitive advantage, when the external environment changes, due to advances in the technological environment. We use the context of changes in the environment due to a rapid growth of the information and communications technologies, such as the Internet.

Additionally, we focus on the pharmaceutical industry for the setting of our research. Traditionally, inter-firm rivalry studies have focused on one specific industry, for example the US airline industry (Chen, 1996); California commuter airlines (Bum and Corn, 1999); and US insurance industry (Fiegenbaum, Thomas and Tang, 2001). Our focus on competitor analysis, in light of the growth of the Internet as an enabling technology (Porter, 2001), seems appropriate because the advent of the Internet has significantly changed the information and knowledge available to consumers in the pharmaceutical industry. Further, Joshi and Yermish (2000) suggest that the Internet has made business processes more transparent. In turn, this transparency has forced the competitor analyst to consider and evaluate many sources of data, which underscores the need for new competitor analysis tools. Under such circumstances, a pharmaceutical firm must use competitive intelligence methods that match with the changes in the environment (Zahra and Chaples, 1993) to develop appropriate tools to avoid blind spots.

The rest of the paper is organized as follows. First, we provide a brief survey of the pharmaceutical industry considering the growth in information and communication technologies. Second, we conceptualize and measure the extent to which a firm intends to use the Internet technologies to manage its customer relationships. Third, we present a measuring tool that integrates competitor analysis with customer analysis in the context of a new technology that is rapidly diffusing among many competing firms. Fourth, while providing a tool, we intend to provide a theoretical lens in the area of competitor analysis. To create an objective and structured measure to assess the web activities of a firm, we apply Analytic Hierarchy Process (AHP) to obtain competitive intelligence in the process of customer relationship management among pharmaceutical firms. Finally, results are presented along with implications for research and practice concerning the use of the tool presented to conduct competitive intelligence when the external environment changes.

CONCEPTUAL FRAMEWORK

The spread of the information and communications technologies has changed the competitive dynamics of firms. When firms find their environment to be hypercompetitive or high velocity, they need to respond using speed and surprise so that they can shift the rules of competition (D'Aveni 1995). In high velocity environments, firm strategies are often more concerned with change (Eisenhardt and

Brown, 1997, 1999), speed (Eisenhardt, 1989; Eisenhardt and Tabrizi, 1995) and flexibility (D'Aveni, 1994). However, to respond quickly and with flexibility, a firm needs to monitor its known competitors.

With changes in the environment, however, the tried and tested tools of competitive intelligence may lead to blind spots (Zahra and Chaples, 1993; Zajac and Bazeran, 1991) because the changed environment may mask the resourcefulness of the competitors under new competitive situations. Thus, it becomes critical to anticipate competitive moves and prepare accordingly. This preparation involves three underlying components of competitor behavior: a) awareness of the competitive relationship as well as awareness about competitor's initiatives (Kathuria, 2000); b) motivations to respond to the competitor's initiatives or act in a preemptive way (Kathuria and Partovi, 2000); and c) capability to act on one's own intentions (Smith et al, 2001). Chen (1996) and Chen et al. (2007) applied this approach to investigate inter-firm rivalry, whereas Chen and Miller (1994) have used the awareness component for analyzing attacks and retaliation. While all three components give rise to the idea of competitive dynamics, for the present manuscript, our focus is on the monitoring that is derived from being aware of the competitive relationship and competitive intentions.

As a firm finds that new technologies, such as the Internet, are adopted by its competitors, it needs to evaluate the motivation of the adoption. Some competitors in the industry adopt a new technology to gain superior information about the new technology (Banerjee, 1992). On the other hand, some competitors are guided by institutional pressures for conformity and legitimacy and hence they are likely to embrace near identical routines and processes (Lee, Smith and Grimm, 2003). For Abrahamson and Rosenkopf (1993), adoption takes place because some competitors have a need for social legitimacy and others have a need due to the fear of loss of competitive advantage. Regardless of the reasons, for a focal firm it becomes critical to monitor the behavior of the competitors and good competitive intelligence might provide explanations of social legitimacy or competitive fear as the cause of adoption.

THE SETTING: CRM IN THE PHARMACEUTICAL INDUSTRY

In a rapidly changing environment, companies have to compete by providing superior value to the customers using either operational excellence, customer intimacy or product leadership strategies (Treacy and Wiersema, 1993). Before the onset of digital era, achieving customer intimacy was not so easy, so the companies mostly adopted operational excellence or product leadership strategies. With the growth of technology and real-time data availability, it has been easier to understand customer needs and build an intimate relationship with them. It has also helped the organization become more resource efficient (operational excellence) and facilitate development of new products and services (product leadership) to meet the customer needs. Thus, CRM is a strategic approach that focuses on developing relationships with key customers to create improved shareholder value (Payne and Frow, 2005).

The CRM approach transforms marketing from being traditional brand-oriented communication to customer-centric relational communication. This transformation creates profitable, long-term relationships with customers and key stakeholders through the combined use of relationship marketing strategies and Information Technology. For a comprehensive understanding of CRM and various research streams within CRM, please refer to recent literature reviews (cf., Soltani and Navimipour, 2016; Sota, Chaudhry, Chamaria and Chauhan, 2018). Using data and information, in the digital age, CRM empowers customers (Edelman and Singer 2015), as well as, helps a firm to: (1)

identify appropriate customers, who have the potential to be activated for engagement, (2) differentiate customers based on their extent of engagement potential, (3) interact with the customers to optimize engagement, and (4) customize products and services to meet the customers' needs (Peppers and Rogers 2004). Effective deployment of CRM strategies can create superior customer relationships, and relationships do matter in building loyalty (Verma, Sharma and Sheth 2016). It also has the potential to differentiate customers based on their value perception of the products and services of the focal firm relative to the competition. CRM strategies are also focused on meeting customer needs leading to more efficiency in resource allocation and utilization.

The pharmaceutical industry, like many innovative industries, considers launching new products and replacing the old products (creative destruction) to be essential for marketplace success (Jambulingam, Kathuria and Doucette, 2005). However, the research and development process for a new pharmaceutical product is often about ten to twelve years long, costing around 800 million US dollars (DiMasi, Hansen and Grabowski, 2003). When the product comes to the market, it is left with about eight years of effective patent life, and hence firms need to recoup their investments within that short time. For this reason, marketing has always been critical in this industry. A study of pharmaceutical firms found that competitively superior marketing and sales capabilities drive superior performance (George and Blumberg, 2000). Specifically, based on an industry-wide survey, they found that marketing and sales capability performance accounted for 42 percent of the variation in financial performance.

The key to success is to develop marketing and sales strategies that are customer-centric. The primary customers for the pharmaceutical industry are physicians and patients. The pharmaceutical industry has used two types of strategies to market to the customers. They are (1) push strategy and (2) pull strategy. The push strategy is effectively communicating and promoting to the physicians to convince them to become aware of the products and thus increase the propensity of prescribing their products. On the other hand, the pull strategy is where firms communicate to the patients and encourage patients to implore their physicians for specific pharmaceutical products. Pharmaceutical firms are assessing the viability of new channels of communication, including the Internet, to enhance their push and pull strategies. Unlike other mass media channels, the Internet can create a one-to-one relationship with the consumers (Tulskie et al., 2000, Belch and Belch 2008).

With the advent of the Internet, the success of pharmaceutical firms depends upon how well they meet the needs of their customers. As the adoption of the Internet became commonplace, Jan Leschly, the then CEO of SmithKlineBeecham, noted that pharmaceutical firms will focus more on the customer or patient needs in terms of price comparison, choice of meds, service, and general level of freedom in making decisions with respect to their pharmaceutical needs (FDA Pink Sheet, 1999). Consistent with Leschly's observation, we concur that the Internet enhances the management of customer relationships by enabling pharmaceutical firms to shift from mass marketing to targeted (one-to-one) interactive marketing (Mougayar, 1998; Brown, 2000). This is also consistent with the argument presented by Leeflang, Verhoef, Dahlström and Freundt (2014), who suggest that due to the rise in digital technologies organizational functions, such as marketing, have been fundamentally redesigned, and hence we suggest that CRM needs to be examined in this light.

Further, competition among pharmaceutical firms for brand recognition is increasing and use of the Internet serves as a vehicle to help their customers recognize their brand (Tulskie et al., 2000). Researchers have suggested that when "brick and mortar" firms move towards becoming "click and

We define customers as any party that ultimately drives demand for pharmaceutical products. In the present study both patients and physicians are treated as customers.

mortar", they try to gain four kinds of synergies: cost savings, improved differentiation, enhanced trust, and market extension if they manage to create an integration of physical and virtual environments (Steinfeld, Bouwman, and Adelaar, 2002). Clearly, it is desirable for the pharmaceutical firms to enhance all four aspects of these synergies. Internet marketing, or use of the Internet to communicate with the customer, has extensive economic benefits (Jambulingam and Sharma, 2010).

An important trend that is shaping the changes in the competitive environment of pharmaceutical firms is a convergence of information technology and innovations of new therapies. This includes pharmacogenomics leading to rapid drug development. With exploding new information, customers (both patients and physicians) want to learn about their options. Pharmaceutical firms see this as an opportunity to identify revolutionary new ways of communicating and connecting with customers. Thus, market extension (Steinfeld, Bouwman, and Adelaar, 2002) is very likely if pharmaceutical firms adopt the Internet.

The combination of customer focus and technological convergence has led to changes in CRM of the major pharmaceutical firms that have direct and mutually acknowledged competitors. The changes are also taking place because the firms have started to treat their customers as partners, not as targets (Edelman and Singer, 2015). Firms are creating Web activities to build their relationships with customer partners. But their focus on the customer type might vary depending upon their marketing focus. This would be applicable even when the firms operate in similar markets and have similar resources. They might focus either on the push strategy targeting primarily physicians or the pull strategy aimed mainly towards patients. Some firms might focus on both strategies equally. In addition, firms have moved away from market segmentation towards the creation of consumer communities (Hagel and Armstrong, 1997), which will be further facilitated by the adoption of the Internet. Thus, firms might incorporate the Internet-based CRM activities depending upon their focus on the type of customers served—patients, physicians or both.

Additionally, it may be noted that innovations and new technologies are not, however, adopted uniformly among competitors (O'Neil, Pouder and Buchholtz, 1998; Lee et al., 2003; Joshi, 2016). There may be variance in the adoption rate of a new technology due to: a) the technology being in its early stages, b) perceived ambiguity concerning efficacy of the new technology, and c) the organizational context (Abrahamson and Rosenkopf, 1993). The varying degree of adoption rate also depends upon the characteristics of the innovation itself (Lee et al., 2003). In the pharmaceutical industry, there may be ambiguity about the efficacy of the Internet for CRM activities because a) it is a regulated industry and there is lack of clear guidelines from the FDA on how industry can use the Internet for promotions, b) lack of understanding of the new Internet technology platform by the product managers, and c) lack of data estimating the return on investment (ROI) on the use of Internet technologies (Johnson 2009).

Given the above-mentioned factors different rates of adoption of the Internet by different firms is based on the firm's appetite to take risk, explore the internet technology, and also in coping up with the different levels of pressure exerted by the business partners of the focal firm (Hsu, Kraemer, and Dunkle, 2006). In addition, different firms have different portfolio of products such as cancer, diabetes, infectious diseases, erectile dysfunction, cholesterol lowering agents, blood pressure, OTC, etc. Firms with products for cancer might target primarily physicians, but firms with lifestyle drugs such as erectile dysfunction might primarily target patients. Given the portfolio of products the companies might have different emphasis on their web strategies. Thus, based on the above-mentioned survey of the pharmaceutical industry, we offer two propositions:

P1:

The extent of adoption of the Internet-based CRM strategies will differ among direct and mutually acknowledged pharmaceutical competitors.

P2:

The extent of intended Web strategies for CRM will vary by the type of customers served across the direct and mutually acknowledged competitors.

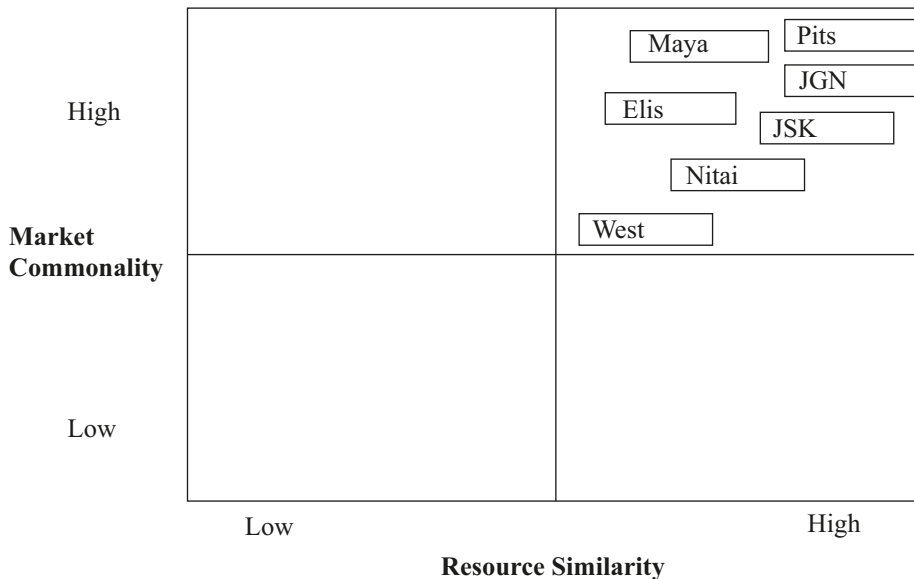
METHODOLOGY**Competitor Identification**

An essential step in a competitor analysis is defining a competitor for the focal firm. A firm's competitor acumen is shaped by the way it is embedded within market engagement relationships (Tsai et al., 2011). Competitors can be defined using either subjective or objective measures (Porter, 1980). In this study, we identify competitors using the framework proposed by Chen (1996). His framework integrates resource factors with market factors. Chen (1996) deploys two constructs: market commonality, and resource similarity. Market commonality is the degree of competitor presence manifested in the overlapping markets of the focal firm. The market commonality is conditioned both by the strategic importance of the shared markets to the focal firm and by the competitor's strength in those markets. The second construct, resource similarity, is defined as the extent to which a given competitor possesses strategic endowments comparable, in terms of both type and amount, to those of the focal firm.

Unique relationships with customers can be one of the most important sources of competitive advantage (Fleisher and Bensoussan, 2002), which can lead a firm to create value. Understanding how a competitor develops and manages its relationship with its customers is a critical component of competitor analysis. Given the ever-growing digitization and availability of information through the Internet, the task of competitor analysis has become highly challenging (Vibert, 2000). A good competitor analyst must match data sources with current methods to avoid blind spots (Zahra and Chaples, 1993).

We contacted three executives working for the competitive intelligence department of a pharmaceutical firm. This firm was ranked as one of the top 10 pharmaceutical firms in the world and is headquartered in the Northeast Region of USA. We contacted the Senior Director of Competitive Intelligence, the Director of Competitive Intelligence and the Assistant Director of Competitive Intelligence, all senior level executives. They were asked to identify direct and mutual competitors with similar resources and market commonality in the pharmaceutical industry, based on the guidelines we outlined above. The executives identified seven firms that had high resource similarity and common markets. These firms are depicted in Figure 1, but with disguised identity as Elis, JSK, JGN, Maya, Nitai, Pits and West.

Figure 1: Identifying Direct and Mutual Competitors



DATA COLLECTION

A manager engaged in competitive analysis must draw data from varied sources (Young, 1989). These sources may include annual reports to the shareholders, government statistics, tax records and bank data, and websites-all of which are in the public domain. Thus, to be more interpretive and comprehensive, as suggested by Young, we gathered data from many independent sources and triangulated it to apply to our approach.

The data for our analysis was obtained from press releases over a period of five years, concerning the intended Web activities of the seven pharmaceutical firms included in our study. These firms are among the top fifteen revenue generators in the pharmaceutical industry in recent years. We collected press releases about the intended web related CRM activities of sample firms. As an additional source of information, we interviewed pharmaceutical executives actively involved in the application of the Internet technologies to their industry. The executives were asked to assist us in interpreting web activities of the seven firms in the sample. In our efforts to triangulate, we also interpreted sample firms' websites (company and product websites of each company) and intended web activities from the documents filed by their strategic alliance partners with the Securities and Exchange Commission (SEC). The SEC requires firms to disclose any activity that may have significant impact on their future and if it is deemed sufficiently large in relation to their size. Due to relatively large size of the seven sample firms, some alliance activities might not have featured in their own SEC filings. But the same activity would appear in the SEC filings of their relatively small strategic alliance partners. When the changes in technology are complementary to the incumbent firms and they are likely to only modify part of the value chain then incumbents "...may be able to survive and even thrive, on radical technological change through cooperation" (Rothaermel, 2000, p.150) Thus, studying the alliance patterns of the competitors provides us with tools for future resourcefulness of the competitor (Hamel and Prahalad, 1989) as well as it provides a firm with greater awareness about the initiatives likely to be taken by its known competitors (Chen, 1996).

Web Activity Categorization

Pharmaceutical firms have two kinds of customers. The first kind is physicians, who prescribe the medication. The second are patients, who use the medication. We content analyzed each announcement, websites etc. to determine if the new Web activity pertained to physicians, patients or both. Next, we categorized the intention of each Web activity by using a modified typology originally proposed by CIBC World Markets(1999). Based on this typology, each Web activity announcement in our sample was classified to reflect basic intentions of the pharmaceutical firm with regards to adoption of the Internet for CRM purposes. The basis of this classification was the extent of use of the Internet for CRM and the target customer-patient or physician.

As a result, the following four types emerged: a) if the intended Web activity was meant to create only an information repository, without many changes over time, it was categorized as "Static Content"; b) if the intended Web activity was meant to create content that changed on a regular basis, it was categorized as "Dynamic Content"; c) if the intended Web activity was to enable two-way communication, between the pharmaceutical firm and its customers, it was categorized as "Connectivity"; and d) if the announcement indicated that a firm will have Web activities that lead to generation of revenues, it was classified as a "Commerce" activity.

In the healthcare industry, the goal of content sites is to promote information on health for the patient and facilitate information sharing for physicians. For patients, static content sites use the Web as an information repository, posting medical dictionaries, or list of diseases/treatments. Whereas dynamic content sites for patients provide online tools and access to current medical news. For physicians, static content sites typically provide medical information and dynamic content sites provide continuing medical education (CIBC World Markets, 1999).

"Connectivity" refers to a dialogue among physicians, patients, and the pharmaceutical firm using Internet-based networks. These sites, also called "transaction enabling" sites, use the Internet technology to link these healthcare participants to improve communications and facilitate transactions. Commerce sites or "e-commerce" sites use the Web as an alternative medium to sell products to consumers. These sites can be "business to business" (B2B) or business to consumer (B2C). Table 1 presents a summary of intended web activities of all seven firms in the aforesaid four categories separated by customer focus.

TABLE 1: Classification of Intended Web Activities Based on Content Analysis of Announcements

| Name of the Activity | Elis | JSK | JGN | Maya | Nitai | Pits | West |
|-----------------------------|------|-----|-----|------|-------|------|------|
| Static Content: Patients | 1 | 4 | 7 | 9 | 6 | 8 | 9 |
| Dynamic Content: Patients | 1 | 2 | 3 | 3 | 4 | 1 | 2 |
| Connectivity: Patients | 1 | 3 | 5 | 4 | 6 | 3 | 3 |
| Commerce: Patients | 1 | 1 | 3 | 8 | 5 | 3 | 4 |
| Static Content: Physicians | 1 | 1 | 1 | 6 | 2 | 1 | 7 |
| Dynamic Content: Physicians | 4 | 1 | 1 | 7 | 7 | 1 | 2 |
| Connectivity: Physicians | 12 | 1 | 1 | 8 | 7 | 1 | 1 |
| Commerce: Physicians | 3 | 1 | 1 | 4 | 1 | 1 | 1 |

Notes: Appendix A provides possible activities within each classification. A single announcement may indicate that a firm has intentions of engaging in more than one sub-activity and, as such, the score reflects that potential.

Using Analytic Hierarchy Process to Develop a Web Activity Measure for CRM

The proposed web activity measure to compare the competing firms' CRM activities was created using the Analytic Hierarchy Process (AHP). This approach has been applied when there are multiple evaluative criteria for ranking or priorities (cf. Saaty, 1980; Golden, Wasil and Harker, 1989). AHP is an interactive, structured process that allows the experts to work together as a group, and the process integrates objective market data with subjective judgment of the experts. The process is based on three steps: 1) describing a complex decision problem as a hierarchy; 2) evaluating the elements at each level along each of the criteria to estimate their relative importance (weight); and 3) integrating the weights to develop an overall evaluation of the alternatives (Partovi and Burton, 1993). The model uses a weighting algorithm to determine the importance of the options in relation to multiple criteria or objectives. The algorithm is based on the idea that pair-wise comparisons recover the relative weights (importance) of items or objects at any level of a hierarchy (Saaty, 1980).

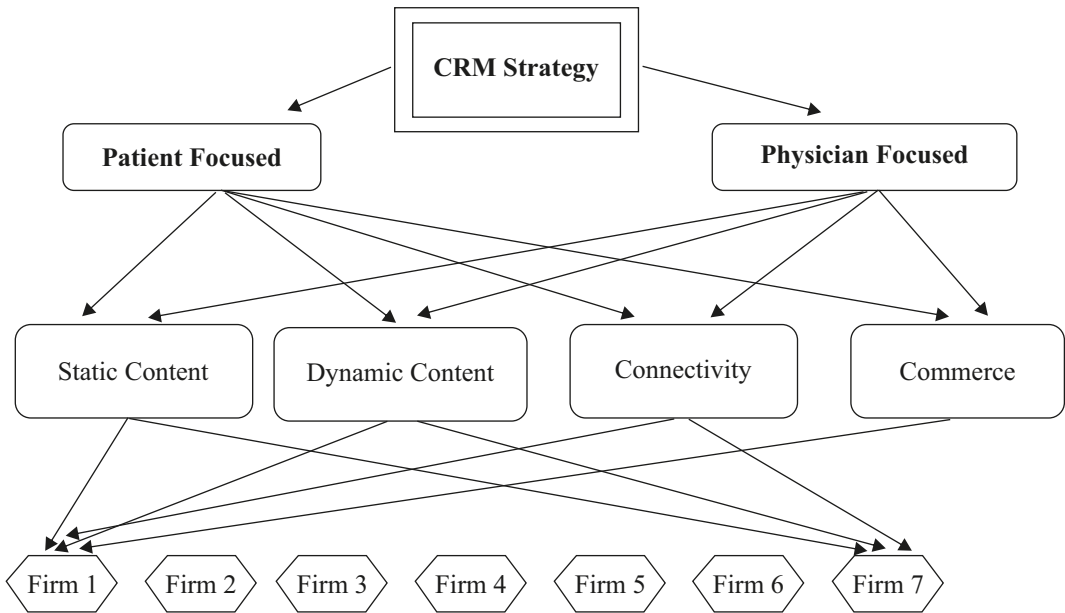
This methodology is superior to other scoring techniques because the weights determined in this scoring system use a ratio scale for subjective valuation, and thus are not arbitrary (Liberatore, 1989; Suh, Suh and Baik, 1994). Consequently, AHP involves experts who understand an industry well or who are qualified to assign judgmental values to ranking or selection process. The benefit of such a process is that everyone can articulate his/her preferences in a manner that is understood by all (Lockett, Hetherington, Yallup, Stratford and Cox, 1986).

Although AHP has been applied to several decision-making situations in areas such as operations management (cf., Partovi, Burton and Banerjee, 1990), it has not been applied in the competitor analysis area. Seiford and Zhu (2003) applied a similar multiple-criteria decision making technique called Data Envelopment Analysis to identify competitors, but not for conducting competitor analysis. Some have applied AHP and benchmarking for strategic analysis (cf., Strojny, 2015), but not for competitive analysis. Generally, the methodology applied in the competitor analysis field has utilized one-to-one comparison approach, but our intention is to compare seven firms using multiple criteria at different levels of decision hierarchy, and obtain a relative ranking of the firms. Thus, the use of AHP was deemed appropriate for the task at hand, and was considered novel and innovative for the field of competitor analysis.

Given the changing environment in the pharmaceutical industry, especially due to adoption of the Internet, we used the Delphi approach to obtain the inputs for AHP. As our industry experts, we used two faculty members who have been active researchers and consultants in the pharmaceutical industry. They have also been regularly teaching in a specialized MBA program designed exclusively for pharmaceutical executives. These experts were provided with the categorization of Web activity announcements of the seven sample firms.

We used AHP to decompose a complex problem of evaluating the Web activities of pharmaceutical firms with respect to customer relationship management, involving multiple criteria into a hierarchy as depicted in Figure 2. The overall objective of the decision lies at the top of the hierarchy, which in this case was to obtain relative rankings of the sample pharmaceutical firms. The next level in the hierarchy involving the primary criteria was the customer focus - patient or physician. The secondary criteria used in the hierarchy were the four possible uses of the Web, namely static content, dynamic content, connectivity and commerce. At the bottom of the hierarchy were seven competing pharmaceutical firms.

Figure 2:
 Multi-level Classification of CRM Strategy of Pharmaceutical Firms



Measuring Web Activity in the Pharmaceutical Industry

In this section, we provide a step-by-step description of how AHP was used in developing a measure of Web activity. First, we describe how we elicit experts' input for the AHP. Next, we illustrate how the input from the experts was converted into preference matrices, and how the corresponding set of weights was obtained. Finally, we demonstrate how the aggregate relative assessments of firms related to their web activities for CRM purposes were computed.

The instructions and questionnaires provided to the experts were extensive and for the sake of brevity we are unable to provide it in this paper. However, an outline of the questionnaire provided to the experts for comparative evaluation of the seven firms using multiple criteria is included in Appendix A. The complete questionnaire with instructions can be obtained from the authors. We used the Delphi approach with minor variation. First, both experts separately evaluated relative importance of the primary and secondary criteria. Next, they were asked to compare the intended Web activities of each firm in relation to the other six firms using the two levels of criteria outlined above. The experts were asked to reach consensus, however, if they failed to reach consensus after several attempts, lack of consensus was resolved by averaging their assessments to arrive at the inputs for AHP. This was necessary given the time constraint on the part of the experts and many comparisons: 13 for the primary and secondary criteria and 168 between-firm comparisons, at the lowest level of the hierarchy.

At the primary level in the hierarchy, while comparing relative importance of the two elements of customer focus, physician versus patient focus, the industry experts reached consensus that pharmaceutical firms' Web activities focused towards physicians were three times as important as the activities focused towards patients. At first this may seem peculiar, but, because the pharmaceutical industry is regulated and most of the drugs cannot generate revenue for the firm unless prescribed by the physicians, the relative weights assigned by the experts reflect the unique feature of this industry.

At the secondary criteria level, there were twelve comparisons made. The inputs from the experts were converted into a preference matrix using Saaty's (1980) recommended scale of comparisons, and corresponding sets of weights for the secondary criteria, for physician as well as patient focus, were calculated. The preference matrix and a corresponding set of weights for the physician focus are shown in the example below. As shown in the matrix, the use of the Web for facilitating dynamic content activities for physicians are more (about two times) important than connectivity.

Preference Matrix for Secondary Criteria under Physician Focus

| Criteria | Content Static | Content Dynamic | Connectivity | Commerce | |
|-----------------|----------------|-----------------|--------------|----------|--|
| Content Static | 2/37 | 1/35 | 3/79 | 1/13 | W= 0.049 0.126 0.266 0.559 |
| Content Dynamic | 13/64 | 4/37 | 2/27 | 10/83 | |
| Connectivity | 6/19 | 11/34 | 2/9 | 1/5 | |
| Commerce | 32/75 | 34/63 | 2/3 | 53/88 | |

A similar preference matrix and a corresponding set of weights were calculated for the patient focus, as reported in Table 2, column 5. We observe interesting patterns at the secondary criteria level. The most striking observation was the focus on providing "connectivity" abilities in a website. The experts' ranked "commerce" to be most important if it was physician focused. If the website's focus was on patients, "commerce" was the least important. Once again, the regulated nature of this industry would explain such a drastic difference in preference. For example, there are opportunities for the pharmaceutical firms to provide commerce activities, such as online prescription filling or continuing education certification, to physicians. On the other hand, there are scant possibilities in offering commerce activities to patients directly. Even if these firms could offer over-the-counter (OTC) drugs, they may be prohibited to use the Web to directly deal with the patients.

TABLE 2: Weights for Each Criteria and Aggregate Relative Assessment For Each Firm Based on AHP

| 1 | 2 | 3 | 4 | 5 | 6 | | | | | | |
|--|--|----------------|--------------------|--------------------|---|-------|--------------------|--------------------|-------------------|--------------------|-------|
| | | | | | Weights obtained through AHP for Individual firms | | | | | | |
| Goal | Primary Criteria | Wts. Thru' AHP | Secondary Criteria | Wts. Thru' AHP | Elis | JSK | JGN | Maya | Nitai | Pits | West |
| Rank of Web Activity | Patient Focus | 0.25 | Static Content | 0.143 | 0.020 | 0.036 | 0.068 | 0.321 | 0.190 | 0.181 | 0.183 |
| | | | Dynamic Content | 0.240 | 0.029 | 0.088 | 0.095 | 0.237 | 0.453 | 0.030 | 0.067 |
| | | | Connectivity | 0.566 | 0.018 | 0.048 | 0.147 | 0.097 | 0.297 | 0.149 | 0.243 |
| | | | Commerce | 0.051 | 0.027 | 0.027 | 0.067 | 0.419 | 0.163 | 0.078 | 0.220 |
| Rank of Web Activity | Physician Focus | 0.75 | Static Content | 0.049 | 0.048 | 0.048 | 0.048 | 0.399 | 0.174 | 0.096 | 0.186 |
| | | | Dynamic Content | 0.126 | 0.225 | 0.033 | 0.033 | 0.135 | 0.467 | 0.033 | 0.075 |
| | | | Connectivity | 0.266 | 0.342 | 0.034 | 0.034 | 0.342 | 0.182 | 0.034 | 0.034 |
| | | | Commerce | 0.559 | 0.276 | 0.046 | 0.046 | 0.494 | 0.046 | 0.046 | 0.046 |
| Rank of Web Activity | Rank based on Criteria 1& 2 for each firm (patient focused) | | | 0.021 | 0.055 | 0.119 | 0.179 ³ | 0.3121 | 0.12 ¹ | 0.191 ² | |
| | Rank based on Criteria 1& 2 for each firms (physician focused) | | | 0.276 ² | 0.041 | 0.041 | 0.404 ¹ | 0.141 ³ | 0.044 | 0.053 | |
| Aggregate Relative Assessment using Criteria 1 & 2 (combining the patient and physician focus) | | | | 0.212 ² | 0.045 | 0.061 | 0.348 ¹ | 0.1843 | 0.06 ³ | 0.088 | |

Notes: Patient focused ranks: 1 Nitai, 2West, 3Maya Physician focused ranks: 1Maya, 2Elis, 3Nitai Grand total Rank: 1Maya, 2Elis, 3Nitai

Further, among the patient focused Web activities, "connectivity" was given the highest importance by the experts, whereas with regards to the physician focus it was about half as important. The difference for connectivity ratings once again is based on the behavior difference between physicians and patients. For patients, particularly, the ones suffering from chronic diseases, connectivity with pharmaceutical firms may become a source of emotional support. The connectivity may allow them to create a virtual community of people who are suffering from similar ailments. On the other hand, for physicians, connectivity may be viewed as a distraction rather than assistance, given the demands on their time.

Next, the pairwise comparisons of each firm, with respect to all of the secondary criteria, under physician focus as well as patient focus (primary criteria), were converted into a set of corresponding weights. We will illustrate this with respect to the static content criteria under the physician focus.

Performance Matrix for Static Content Under Physician Focus

| | Elis | JSK | JGN | Maya | Nitai | Pits | West | |
|-------|------|-----|-----|------|-------|------|------|---|
| Elis | 1 | 1 | 1 | 1/7 | 1/3 | 1 | 1/9 | W= 0.048 0.048 0.048 0.399 0.174 0.096 0.186 |
| JSK | 1 | 1 | 1 | 1/7 | 1/3 | 1 | 1/9 | |
| JGN | 1 | 1 | 1 | 1/7 | 1/3 | 1 | 1/9 | |
| Maya | 7 | 7 | 7 | 1 | 3 | 7 | 9 | |
| Nitai | 3 | 3 | 3 | 1/3 | 1 | 3 | 7 | |
| Pits1 | 1 | 1 | 1 | 1/7 | 1/3 | 1 | 9 | |
| West | 9 | 9 | 9 | 1/9 | 1/7 | 1/9 | 1 | |

In this example, Maya's intended Web activity related to building static content aimed at physicians is nearly twice as much as Nitai and West, and about four times more than Pits'. Similarly, weights were calculated for each of the eight (4x2) combinations of the two criteria, which provided a relative evaluation for the seven firms on each of the four secondary criteria, under physician- as well as the patient-focus. The weights are furnished in the third panel of Table 2, under Physician focus.

Next, the relative assessment of a firm is calculated by determining the product of the criteria priorities and the extent of a firm's web activities by customer focus-physicians and patients. In the example below, we show how the weights representing relative assessment of the firms' web activities aimed at physicians are calculated. Similarly, weights for the patient focus were determined.

Relative Assessment of Firms' Web Activities with Physician Focus

| | Static | Dynamic | Connectivity | Commerce | W |
|-------|--------|-------------|--------------|----------|-------|
| Elis | 0.048 | 0.225 | 0.342 | 0.276 | 0.276 |
| JSK | 0.048 | 0.126 0.333 | 0.034 | 0.266 | 0.041 |
| JGN | 0.048 | 0.033 | 0.034 | 0.046 | 0.041 |
| Maya | 0.399 | 0.135 | 0.342 | 0.494 | 0.404 |
| Nitai | 0.174 | 0.467 | 0.182 | 0.046 | 0.141 |
| Pits | 0.096 | 0.033 | 0.034 | 0.046 | 0.044 |
| West | 0.186 | 0.075 | 0.034 | 0.046 | 0.053 |

Finally, the aggregate relative assessments of firms were computed by determining the product of the primary criteria priorities and the weights determined in the step above.

Aggregate Relative Assessments of Firms' Web Activities

| | | | | | | |
|-------|-------|-------|-------|-------|---|-------|
| Elis | | 0.276 | | 0.021 | | 0.212 |
| JSK | | 0.041 | | 0.055 | | 0.045 |
| JGN | | 0.041 | | 0.119 | | 0.061 |
| Maya | =0.75 | 0.404 | +0.25 | 0.179 | = | 0.348 |
| Nitai | | 0.141 | | 0.312 | | 0.184 |
| Pits1 | | 0.044 | | 0.121 | | 0.063 |
| West | | 0.053 | | 0.191 | | 0.088 |

RESULTS

Table 2, bottom panel, provides the overall rankings of each of the seven firms and their Web activities. The experts' relative assessment of physician focus versus patient focus, when assessing the Web activities of a pharmaceutical firm, is reflected in the overall rankings. Since physician focus was weighed in three times compared to the patient focus, it is safe to say that the aggregate relative assessments of firms' Web activities are driven by the importance given to physician focus. As seen in Table 2, Maya is ranked at the top with a weight of 0.348, followed by another group of firms - Elis and Nitai with scores of 0.212 and 0.184 respectively. JSK is at the bottom of the pile with a score of 0.044 and West with a score of 0.087 ranks higher than JSK but lower than Elis and Nitai. The remaining two, Pits and JGN with scores of about 0.06, are far behind the ranking obtained by Maya. These results support our Proposition P1 that the direct and mutual competitors show a difference in the extent of intended Web activities for CRM purposes.

Additionally, results from Table 2 suggest that Elis, which is ranked at the bottom with regards to the patient focus, moves up to the second rank when evaluated from the physician focus. This is because Elis' focus is on influencing physicians more than patients. West, on the other hand, has primary focus on patients because they have more OTC products in their portfolio. Hence, it is ranked second in the patient focused Web activities. Maya and Nitai are consistently ranked among the top three within both patient and physician focus, but Maya ranks first based on its intended physicians focused web activities whereas Nitai is at the top based on patient focused activities. This indicates that the adoption of the Internet based technologies for CRM purposes is different for firms focusing on physicians as opposed to patients. Thus, we find support for our Proposition P2, that adoption of the Internet for CRM is different depending on the type of customer served-patients, physicians or both.

DISCUSSION OF RESULTS

The aim of this paper was to develop a competitor analysis tool that would allow us to benchmark Internet-based CRM activities of competing firms. To achieve this objective, we integrated the existing literature on competitive analysis, diffusion of innovation, awareness about competitors (Lee et al., 2003; Chen, 1996; Zahra and Chaples, 1993; Abrahamson and Rosenkopf, 1993; Zajac and Bazerman, 1991) and customer relationship management (Peppers and Rogers, 2004). The resultant propositions were tested by applying a multi-criteria decision making technique, AHP, that was used to compare the intended Internet-based CRM activities of pharmaceutical firms. In the process, we demonstrated the usefulness of AHP for benchmarking Web activities of firms in a competitive setting. The rankings reported in Table 2, as an outcome of the application of AHP, indicate that our propositions (P1 and P2) were supported.

We had postulated that adoption of the Internet would be different among competing pharmaceutical firms, particularly with respect to the Web-based CRM activities. In the present study, our focus was on four types of Web activities-static content, dynamic content, connectivity, and commerce-aimed at two types of customers, physicians and patients, which allowed us to compare direct and mutually acknowledged competitors. Using AHP, we could demonstrate differences in adoption of the Internet among competing firms. While we acknowledge that many other factors may be involved in a firm's decision regarding adoption of the Internet-based CRM, our approach helped us understand the importance of customer focus towards the adoption of Internet-based CRM activities.

In the case of the pharmaceutical industry, we find that the competitors will adopt the Internet-based CRM in varying degrees because the perceived usefulness of the Internet based on the portfolio of their products for CRM purposes. Further, from the organizational context, the rate of adoption of the Internet is also dependent upon a competitor's focus on the type of customers-in our case, patients, physicians, or both. Our approach provides a manageable tool for a competitive analyst considering the information explosion due to the Internet (Vibert, 2000; Joshi and Yermish, 2000). When applied to the pharmaceutical industry, we find that the sample firms intend to conduct CRM in varying degrees using the Internet. Maya, Elis and Nitai are vigorously adopting the Internet for customer relationship management. On the other hand, JSK and JGN, relatively speaking, have not been as active in adopting the Internet based CRM activities as they may not have been able to ascertain the efficacy of the Internet for CRM purposes yet. Further, from the organizational context, it is possible that their current systems of CRM might be performing as desired and hence no need to adopt the new technology vigorously. This finding is consistent with Evans and Wurster (2000) who suggest that firms may resist new Internet technologies if they have been strongly entrenched and committed to their legacy systems.

For managers, these results suggest that to gain a competitive edge in the realm of CRM through the Internet, firms need to monitor their competitors' Web activities by use of frameworks and with a focus on a few key variables. For example, from a competitive intelligence or competitor analysis perspective, a firm that considers itself like West would focus on patient-related Web activities rather than physicians-oriented Web activities. One of the advantages of using competitor analysis as described in the present study is that it provides a tool for benchmarking and rank ordering of a group of competitors. This is an essential ingredient for successful competitive intelligence. By using AHP, a firm can fine-tune its competitive analysis at different hierarchical levels, as demonstrated in Table 2. This would certainly be useful in the development of a firm's competitive strategies and customer relationship management system.

CONCLUSION AND IMPLICATIONS

In this paper, we have demonstrated that while there are no existing tools that facilitate competitive analysis considering the growth of the Internet and communication technologies and different customer orientations, existing frameworks can be extended with a proper application of theoretical perspectives. We have shown that with extensions and modifications of competitor analysis perspective from Chen's (1996) framework, one may capture competitive trends in a firm's environment due to the growth of the Internet and communication technologies. Particularly, this becomes evident when Chen's framework is combined with the adoption of innovation framework (Abrahamson and Rosenkopf, 1993; Lee et al., 2003). It is possible to create specialized approaches that will help a focal firm understand its competitors' moves in the rapidly growing electronic commerce environment.

LIMITATIONS AND RESEARCH DIRECTIONS

This study is not free from limitations, which provide opportunities for future research. For instance, the analysis in the present paper focuses on rank ordering, but does not attempt to map which strategy or which kind of Web activity would lead to better performance. Thus, future research should include measuring and evaluating a comprehensive Web strategy along the entire value chain and then applying a technique like AHP to rank order the importance of each value chain activity, considering the Internet adoption by a firm.

Future studies should consider expanding the proposed model to incorporate social media, mobile technology, apps, and wearables in assessing customer engagement. The extent to which customers are activated or gain engagement is less understood. Future research should examine different aspects of various online tools and their activation potential to engage customers. For example, in the pre-diagnosis and diagnosis state, a customer, i.e., a patient might not seek care due to lack of awareness, social stigma, infrequent medical checkups and cost burden. What type of online communication, such as social media, mobile or wearable technology would provide better methods of education, collaboration with patient groups, and access to medications at affordable prices?

Future research should also examine how the customer insights and intelligence gained from the patient and physician experiences could be used to develop better products and services. Additionally, how can we predict customer activation, engagement and loyalty using more precise metrics? Future research should address how to customize the content that is unique to each customer, based on their need and interests. Can pharma develop digital technologies that can be customized for each customer type—physicians and patients? Finally, payers have recently been more important customers to pharma companies. How to engage payers using the digital online technologies can also be a fascinating extension of this research.

MANAGERIAL IMPLICATIONS

While this study has focused on the rise of the Internet and related competitive analysis with respect to adoption of the Internet technologies among pharmaceutical firms, the technique and approach are both generalizable to a larger degree because the information and communications technologies are crucial for managing organizational operations and improving organizational performance (Porter, 2001; Rajendran and Vivekanandan, 2008; Schlemmer and Webb, 2009). The key point we are proposing to the managers is about the adoption of a new technology and the related competitive advantage. For instance, in the next phase of digital transformation, firms will focus on the adoption of Internet of Things (IoT) as a tool for gaining competitive advantage (Gubbi, Buyya, Marusic, and Palaniswami, 2013), and for any firm the competitive analysis tools, such as AHP, will be vital again.

Competitive analysis is essential for a manager to gain competitive advantage through the adoption of new technologies in an innovative way (Joshi, Das and Mouri, 2015). If the managers, in charge of competitive analysis, do not create and use appropriate tools to understand the adoption of new technologies by its competitors, they would find their firms at a disadvantage in a fast-changing technology cycle.

The competitive analysis methodology presented in this study can be adopted in other industries and sectors, beyond the pharmaceutical industry, which are experiencing changes in their competitive landscape due to the new technologies related to communications and data analysis. This methodology is particularly significant if customers are segmented by their buying behavior, geography or other characteristics. For instance, the software industry will be a good candidate because of the diffusion of emerging technologies, such as the use of open source coding in software development, and its segmented customer base: individual, corporate, and government.

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APPENDIX A

Sample questions answered by the two experts:

Primary Criterion.

Preference Matrix for Web Activity

How important (preferred) is Patient focus of a web site to Physician focus in judging/evaluating WebActivity of various pharmaceutical firms?

Equally important

Moderately MORE important

Moderately LESS important

Strongly MORE important

Strongly LESS important

Very strongly MORE important

Very strongly LESS important

Extremely MORE important

Extremely LESS important

Secondary Criteria.

Preference Matrix for Patient Focused Web Activity

How relevant /important (preferred) is Content type of a web site to Content Access in judging/evaluating PatientFocused Web Activity of various pharmaceutical firms' web sites?

Equally relevant /important

Moderately MORE relevant/ important

Moderately LESS relevant/important

Strongly MORE relevant/important

Strongly LESS relevant/ important

Very strongly MORE relevant/important

Very strongly LESS relevant/ important

Extremely MORE relevant/ important

Extremely LESS relevant/important

How relevant/ important (preferred) is Content type of a web site to Connectivity in judging/evaluating Patient FocusedWeb Activity of various pharmaceutical firms' web sites?

Equally relevant /important ...

(Similar questions were asked to make all possible pair-wise comparisons for the Patient Focused Web Activity.)

Preference Matrix for Physician Focused Web Activity

How relevant /important (preferred) is Content type of a web site to Content Access in judging/evaluating Physician Focused Web Activity of various pharmaceutical firms' web sites?

Equally important

Moderately MORE important

Moderately LESS important

Strongly MORE important

Strongly LESS important

Very strongly MORE important

Very strongly LESS important

Extremely MORE important

Extremely LESS important

(Similar questions were asked to make all possible pair-wise comparisons for the Physician Focused Web Activity.)

APPENDIX A (continued...)

Between Firms Comparison.

Pairwise comparisons of the seven Websites on Patient focused Attribute X (e.g., Static Content)

Please fill the upper diagonal matrix only. Moving from left to right, compare Elis's web site with JSK's, then with JGN's, and so on, on the above mentioned criterion, using the following scale:

1 = Equally appealing

3 = Moderately MORE appealing

5 = Strongly MORE appealing

7 = Very strongly MORE appealing

9 = Extremely MORE appealing

1/3 = Moderately LESS appealing

1/5 = Strongly LESS appealing

1/7 = Very strongly LESS appealing

1/9 = Extremely LESS appealing

| | Elis | JSK | JGN | Maya | Nitai | Pits | West |
|-------|------|-----|-----|------|-------|------|------|
| Elis | 1 | | | | | | |
| JSK | | 1 | | | | | |
| JGN | | | 1 | | | | |
| Maya | | | | 1 | | | |
| Nitai | | | | | 1 | | |
| Pits1 | | | | | | 1 | |
| West | | | | | | | 1 |

(Similar matrices were provided for the other three attributes - dynamic content, connectivity and commerce - for Patient Focus.)

APPENDIX A (continued...)

Pairwise comparisons of the Seven Websites on Physician focused Attribute X (e.g., Dynamic Content)

Please fill the upper diagonal matrix only. Moving from left to right, compare Elis's web site with Glaxo's, then with J&J's, and so on, on the above mentioned crieterion, using the following scale:

1 = Equally appealing

3 = Moderately MORE appealing

5 = Strongly MORE appealing

7 = Very strongly MORE appealing

9 = Extremely MORE appealing

1/3 = Moderately LESS appealing

1/5 = Strongly LESS appealing

1/7 = Very strongly LESS appealing

1/9 = Extremely LESS appealing

| | Elis | JSK | JGN | Maya | Nitai | Pits | West |
|-------|------|-----|-----|------|-------|------|------|
| Elis | 1 | | | | | | |
| JSK | | 1 | | | | | |
| JGN | | | 1 | | | | |
| Maya | | | | 1 | | | |
| Nitai | | | | | 1 | | |
| Pits1 | | | | | | 1 | |
| West | | | | | | | 1 |

(Similar matrices were provided for the other three attributes-static content, connectivity and commerce-for Physician Focus.)