

How can hospitality organizations create IT induced competitive advantage? A Theoretical Framework

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Abstract

This paper investigates the IT-induced competitive advantage in the hospitality industry. Moreover, it attempts to understand the structure of technology benefit stages in the industry since such benefits depend on various components such as managements' perception towards the technology, the sophistication of the deployed technologies, critical resources, and integration of the resources. Owing to the exploratory nature of the study, a semi-structured interview technique was chosen as the main data collection method since it allows a deep, detailed descriptions and imaginative explorations of participants' ideas and experiences. A sample of members of AHLA E-Commerce and Technology Committee is interviewed. Probing technique was used during the interview process. The research results indicate that IT induced competitive advantage is possible when hotels choose to invest in technologies with higher management skills and integrate all the possible technologies in the organization with a harmony that creates synergy. Critical resources and the sophistication of the selected technologies are also important.

Key Words: Information Technologies, Competitive Advantage, Technology Sophistication, Hospitality Industry, Management Skills, Critical Resources, Resource Integration

1. Introduction

An important objective of IT research is to measure the value of information technology to an organization and to understand the determinants of that value (Taylor & Todd, 1995). Hospitality organizations attempt to understand what and how technologies can lead to competitive advantage through enhanced productivity and value (Buhalis, 1998). Some firms invest in IT and enjoy competitive advantage whereas some are struggling to gain competitive advantage from IT. The determinants of this phenomenon should be investigated. One of the common mistakes made while approaching this problem is assessing the relationship between IT expenditure and firm performance which is almost identical to inputs to outputs comparison (Amran, Kulatilaka, & Henderson, 1999; Beath & Ives, 1986; Bruque & Medina, 2002; Sambarnurthy & Zmud, 1997). However, technologies in organizations can be used in various levels which result in different impacts on the firm depending on a plethora of organizational factors such as an organization's mission, vision, technology innovation, resources, technology integration and skills. Contemporary organizations in all industries are vitally dependent on their information systems (Peppard & Ward, 2004). Moreover, firms are increasingly looking towards the innovative application of technology to present IT-induced competitive advantage. The early IT implementations were clearly focused on the automation of clerical and repetitive tasks, after 1980s firms started to seek opportunities to leverage IT for business advantage (Somogyi and Galliers, 1987). However, even today, many investments in IT are not for any competitive advantages but for efficiency and effectiveness reasons (Peppard & Ward, 2004). Technology might significantly enhance competitive edge at a higher level by improving information sharing, providing better communications, improving decision making process (Brown, Gatian, & Hicks, 1995; Brynjolfsson, 1993; Mukhopadhyay & Kekre, 2002), or it might only support the organization's basic operations at a lower level by automating the routine activities (Barney, 1999; Bharadwaj, 2000; Byrd, 2001; Christensen, 1994). In order to create IT-induced competitive advantage, the information system to be adopted needs to fit into the organizational strategy (Meador, 1999), culture (Harper & Utley, 2004), and structure (Chaudhuri & Tabrizi, 1999), in order to differentiate the organization.

The purpose of this research is to assist hospitality organizations better deploy and manage their IT resources and enhance overall effectiveness. This paper also aims to demonstrate how technologies can be used as a competitive weapon at various levels from a managerial perspective. To achieve this goal, a theoretical framework is proposed to critically explore levels of competitive advantage induced by IT in an organization as a result of four organizational factors: critical resources, management skills, resource integration and technology sophistication.

2. Theoretical Background

There are various motives to inspect the role, influence, and relationship of IT to competitive advantage. The existing research is fraught with elucidating the basic drivers of IT to firm performance, not to mention competitive advantage (Bharadwaj, 2000; Powell & Dent-Micallef, 1997). In addition, theories antecedently used to explain IT and competitive advantage need to be restructured and modernized (Bharadwaj, 2000). Companies invested more than 2 trillion dollars yearly worldwide on IT (Carr, 2003). Hospitality industry in the US is investing a tremendous amount of financial resources on IT and this deserves better forethought, perception, and vision, into how ITs lead to a competitive advantage. On the other hand, some organizations do not invest in IT because they are not certain if they will benefit from IT (Cuervo-Cazurra & Un,

2010). There is a need to expand an enhanced framework in order to understand IT induced competitive advantage. Besides, the productivity paradox of hotel-industry technology by David, Grabski, and Kasanova (1996) should be investigated critically from the operators' point of view. Numerous articles in the literature claim that IT doesn't improve firms' performance (Carr, 2003; Brynjofsson, 1993; David, et al., 1996). Controversially; some claim that there is a positive relationship between IT and performance (Dewan & Min, 1997; Hitt & Brynjofsson, 1995; Kelley, 1994; Siegel & Griliches, 1992). The theoretical literature on IT and competitive advantage assert that IT-enabled strategies can lead to a sustainable competitive advantage (Feeny and Ives, 1990), the determinants of IT-induced competitive advantage have not been investigated in the lodging industry. Previous research used variables such as IT capital, IS labor expense (Prasad & Harker, 1997), number of years CIO in the position, software budget (Prattipati & Mensah, 1997), and IT investments (Francalanci & Galal, 1998) to examine IT payoff. However, there are other factors that have to be taken into account such as an organization's mission, vision, technology innovation, resources, and skills that can create IT-induced competitive advantage by creating a synergy within the firm.

Researchers who have studied technology in the hospitality industry agreed that technology made a significant change to the way people work, interact, manage, and do business (Cline, 1996; Wolf, 1997; Collins, & Cobanoglu, 2003; Kasavana, 1991). According to Buhalis and Law (2008), the introduction of the Computer Reservations Systems (CRSs), Global Distribution Systems (GDSs), and lastly the development of the Internet have altered the operational and strategic practices in the hospitality industry. According to a study conducted by Andersen Hospitality Consulting, the lodging industry's primary focus would shift to customers from physical assets (Cline, 1997). Technology plays an important role in helping lodging industry to reach and maintain customer focus. At the backdrop of the changing requirements as well as increasing transactions, hotels need powerful and integrative IT tools not only to achieve a competitive advantage but also to survive. However, there is no framework that would assist practitioners to understand how to achieve IT-induced competitive advantage in hospitality industry.

Porter (1985) defines competitive advantage as obtaining a unique position relative to its competitors that allows it to consistently outperform them. According to Barney (1991) competitive advantage is to implement a value creating strategy not simultaneously implemented by any current and potential competitors. The term competitive advantage has been defined in various ways in the literature (see Porter, 1980; Peteraf, 1993; Saloner et al., 2001; Barney, 2002). Three conceptual frameworks for competitive advantage have assisted managers in identifying the sources of competitive advantage: Porter's five forces approach, the resource based approach, and the relational forces (Kim, Oh, 2004). A competitive advantage can be achieved by execution of one or more strategies not currently in use by competitors to enhance firm positioning and value (Bone & Saxon, 2000). Competitive advantage can also result from a superior execution of strategies, speed, agility, and implementation of resources above and beyond the competition's approach (Barney, 1991; Bharadwaj, 2000). Low cost, value added, speed, agility, innovation, and customer service are key competitive advantages discussed extensively in the literature (Barney, 1991; Bharadwaj et al., 1993; Eisenhardt & Brown, 1998; Porter, 1980; Sanchez, 1993, 1995; Stalk, Evans, & Shulman, 1990). ITs also yield to these key competitive advantages. For instance, by implementing a CRM, a hotel may increase customer service, or by utilizing revenue management system, the agility of the hotel increases.

2.1. *IT Usage Stages and IT-Induced Competitive Advantage*

Literature supports the claims that technology adoption and use occur in stages (Scot Morton 1991; Rogers 1983). More recent models (see Scott Morton, 1991; Thorp, 1998) deploy a three-stage model of technology adoption and use. The initial stage is automation, followed by information and transformation. Usually, the motivation for investing in new technologies in organizations is to achieve effectiveness and cost saving. The first stage, automation, is principally automating the already existing processes in an organization. Second stage deals with gaining information through an IT. In the last stage (transformation), the technology is integrated into the concepts of the organization. IT use in that stage is more complex, and enables organizations to reach real productivity. Another widely accepted model (Somogyi and Galliers, 1987) captures the evolution of IT in organizations in three distinct eras: data processing (DP), management information systems (MIS), and strategic information systems (SIS).

The most recent model from the communications perspective suggested that Internet technology adoption occurs in three different stages: substitution, enlargement, and reconfiguration (Contractor, 2002). The adoption starts with the substitution stage in which technology is mainly used to complete the regular tasks of the organization. This phase is the initial, basic stage and requires limited resources, basic skills, and more importantly no change in the structure of the organization. In the enlargement stage firms are able to do more of the same kind with less effort. However, impacts on the actual business remain small because the technology is not integrated into organizational structures and activities. In the last stage, integration of technologies into organizations' structures are accomplished, new things are done in new ways which requires higher knowledge and skills from both management and frontline employees (Yuan, Gretzel, & Fesenmaier, 2003).

Nolan (1979) described the growth processes and the development of the use of IT in organizations; his model included two eras; the data processing era and the IT era. Later, Mutsaers et al. (1998) advanced that model by adding a new era; the network era. Similarly, Mochella (1997) proposed a framework that points out four focal eras in IT use. The framework included system-centric, PC-centric, network centric and content centric eras. Sigala et al.(2001) proposed a framework of the stages of development in IT for reservations management by combining those two frameworks.

The phenomenon in the hospitality industry has not been investigated deeply, it is not very clear if hotels can create IT-induced competitive advantage, if so, how do they create, what are the driving factors, is there a trend and commonalities between the hotels that create IT-induced competitive advantage. Moreover, which factors are driving hotels to use IT in different eras? It is also important to ascertain the technology applications that are used in hospitality industry that create competitive advantage and group these technologies in the eras that are defined in the literature.

2.2. *Technology Sophistication*

The link between IT sophistication and company performance has received significant attention in the literature over the years. Some empirical studies indicate mixed support for the hypothesis that IT sophistication has a direct effect on service performance. Búrca et al. (2005) advocate that in order to call a firm technologically sophisticated, that firm needs to face up to

some challenges: First of all, the firm requires a robust scientific-technical base; secondly, new technology can quickly make existing technologies obsolete, and, lastly as new technologies come on stream, their applications create or revolutionize markets and demands. Porter (1980) presents solid evidence that technology sophistication is related to firm performance. Búrca, Fynes, & Brannick (2006) investigated the relationship between service practices, service performance, business performance and IT sophistication. Their study pointed out that IT sophistication moderates the services practice-service performance relationship.

2.3. *Management Skills*

Keen (1993) posits that when every leading firm in an industry has access to the same technology resource, the management difference determines competitive advantage or disadvantage. Literature supports the view that organizational capabilities influence the way technology used in organizations (Yuan, Gretzel, & Fesenmaier 2003; Teece, Pisano, & Shuen 1994). Success of IT usage is supported by high management skills. Yuan et al. (2003) indicates that technology usage is influenced by organizational properties, personal characteristics of the leader, and the fit between technology and organizational activities. In order to implement and use IT applications managerial skills are needed (Capon and Glazer, 1987). According to Mata et al. (1995), managerial skills include management's ability to conceive of, develop, and exploit IT applications to support and enhance other business functions. Mata et al. (1995) claim IT management skills are likely to be a source of sustainable competitive advantage. It has been proposed that management's understanding of the potential for IT to be a source of competitive advantage was important for American Airline's ability to develop the SABRE system (Copeland and McKenney, 1988). Mata et al. (1995) conclude that only IT management skills may lead to sustained competitive advantage. They also acknowledge that there may be other attributes which has to be discovered. Ray, Muhanna, & Barney (2005) empirically found out that managerial IT knowledge leads to enhanced customer service performance. They indicated that a complementary interaction between IT applications and managerial IT knowledge enhances performance.

2.4. *Resource Integration*

The foundation of resource integration points out the maximization of competitive advantage of a firm through combining and utilizing valuable resources. That is, firms are viewed as attempting to find the optimal resource boundary through which the value of their resources is better realized than through other resource combinations (Das, & Teng, 2000). Technology *per se* will not bring about enhancement or provide solutions if the processes and systems are ineffective. Many complicated pieces of a large puzzle must fit together. These pieces include devices and systems sold by different vendors, different interfacing options between systems. Sigala et al. (2004) revealed that the hotel which has more sophisticated technologies that are integrated achieved significantly greater productivity scores than those using technologies for automation only. Unlike other recent trends in management - such as quality, excellence, leadership or empowerment - the notion of integrating organizations and IT strategically may be seen to have a more rational edge in so far as technology is seen as an objective external referent (Bloomfield & Danieli, 1995). Dong, Xu, & Zhu (2009) also highlights that IT value comes from “fitting the pieces together”.

2.5. *Critical Resources*

Clemons and Row's (1991) resource-based 'strategic necessity hypothesis' claims that IT creates advantage by leveraging or exploiting existing human and business resources. Literature highlights that sophisticated IT users did not outperform less sophisticated users, however, the ones that combined IT with critical complementary human and business resources did gain performance advantages (Powell & Dent, 1997). Wernerfelt (1989) claims that companies might list some patents, brand names, good managers as critical resources and these resources has to be unique in order to gain competitive advantage. Literature also argues that processes of resource accumulation and deployment that lead to idiosyncratic endowments of proprietary assets (Collis and Montgomery, 1995; Dierickx and Cool, 1989; Peteraf, 1993; Prahalad and Hamel, 1990; Wernerfelt, 1984) and provides the source of sustainable competitive advantage (Teece et al., 1997). The information, systems and technology owned or available to the firm are an increasingly important set of resources—often referred to as the IT infrastructure—but in the context of IS management the critical resources are the knowledge and skills residing in employees or the employees of third-party vendors.

3. Research Methodology

3.1. Research Design

This study attempts to understand the structure of technology levels that bring IT induced competitive advantage to a hotel from managerial perspective. Owing to the exploratory nature of the study, this research investigates the problem with the interview process. We believe that this approach would be effective in revealing the participants' stories and allow them to reveal thoughtful insights about the meanings of their experiences and knowledge. Due to the exploratory nature of this study, a semi-structured interview technique was chosen as the main data collection method because it allowed for deep, detailed descriptions and imaginative explorations of participants ideas and experiences. The purpose of the interview was to learn about hotel technology managers' perceived experiences and insights. Researchers engage a dialogue with the key decision makers in an effort to fully understand the situation that has motivated our research effort.

A sample of members of AHLA E-Commerce and Technology Committee were interviewed for their knowledge and insight towards the perceived problem. The committee is comprised of technology executives, who meet twice per year to discuss the changing face of technology and e-business in the hospitality industry. Interviews with key decision makers are one of the best ways to identify the key symptoms (Zikmund, Babin, Carr, & Griffin, 2009). Probing technique was used during the interview process. Probing is an interview technique that tries to draw deeper and more elaborate expressions from the discussion. This probing technique is very advantageous in pinpointing key variables that are prime candidates for the study (Zikmund, Babin, Carr, & Griffin, 2009).

Myers and Newman (2007) examined the qualitative interview in IS research. One of the interview type that they proposed for IS research was "unstructured or semi-structured interview" which is used in this study. Twelve interviews were done with key decision makers in the lodging industry. Questions were asked in such a fashion that reveals the technologies used in every stage. Respondents were asked to list the technologies that create competitive advantage. Moreover, they were asked to indicate their opinions about the role of management skills, critical resources, technology sophistication, and resource integration in gaining IT induced competitive advantage in hospitality organizations. Based on Creswell (2009), grounded theory was utilized

as it provides systematic steps which allow developing integrated concepts and provide theoretical explanation to phenomena (Corbin & Strauss, 1990). Furthermore, word clouds were used to identify common themes for each question with the help of IBM ManyEyes software. Visual data presentations offer a richer sense of what is happening in the data and suggest possible directions for further study. Word clouds can quickly give the user an overview of the most salient terms in a large corpus of text (Viégas, Wattenberg, Ham, Kris, and McKeon, 2007). Word clouds visually represents the common themes by font size, the bigger font indicates that the word has occurred more than the smaller font themes during the interviews.

4. Proposed Framework

After investigating the literature in strategic technology usage, and interviews with the key decision makers, a framework was created (See Figure 1). Anecdotal evidence from the respondents has indicated that hospitality organizations use ICT (Information & Communication Technologies) at four stages (operation stage, enhancement stage, strategic stage, and transformation stage). Depending on which stage they are in, the competitive advantage created/induced by ICT usage will be different, with higher levels of ICT usage arguably creating higher levels of competitive advantage. A fundamental note from the previous research, and one that is universally accepted, is that technology itself has no inherent value and that IT alone is unlikely to be a source of sustainable competitive advantage (Peppard & Ward, 2004). Research indicated that the management skills are needed in order to gain competitive advantage through an IT (Dehning & Stratopoulos, 2003; Keen, 1993; Mata et al, 1995). Furthermore, Clemons and Row (1991) indicate that to facilitate IT-induced competitive advantage firms need leverage or exploit existing human and business resources. Other factors that offers IT-induced competitive advantage are integration of resources (Dong, Xu, & Zhu, 2009) and technology sophistication (Fynes, & Brannick, 2006). Our interviews have indicated that there are four major factors that determine the value of IT in hotels. The diagonal line in Figure 1 represents the ICT induced competitive advantage as it yields better results (basic to advance) which require high resource integration, management skills, critical resources, and technology sophistication.

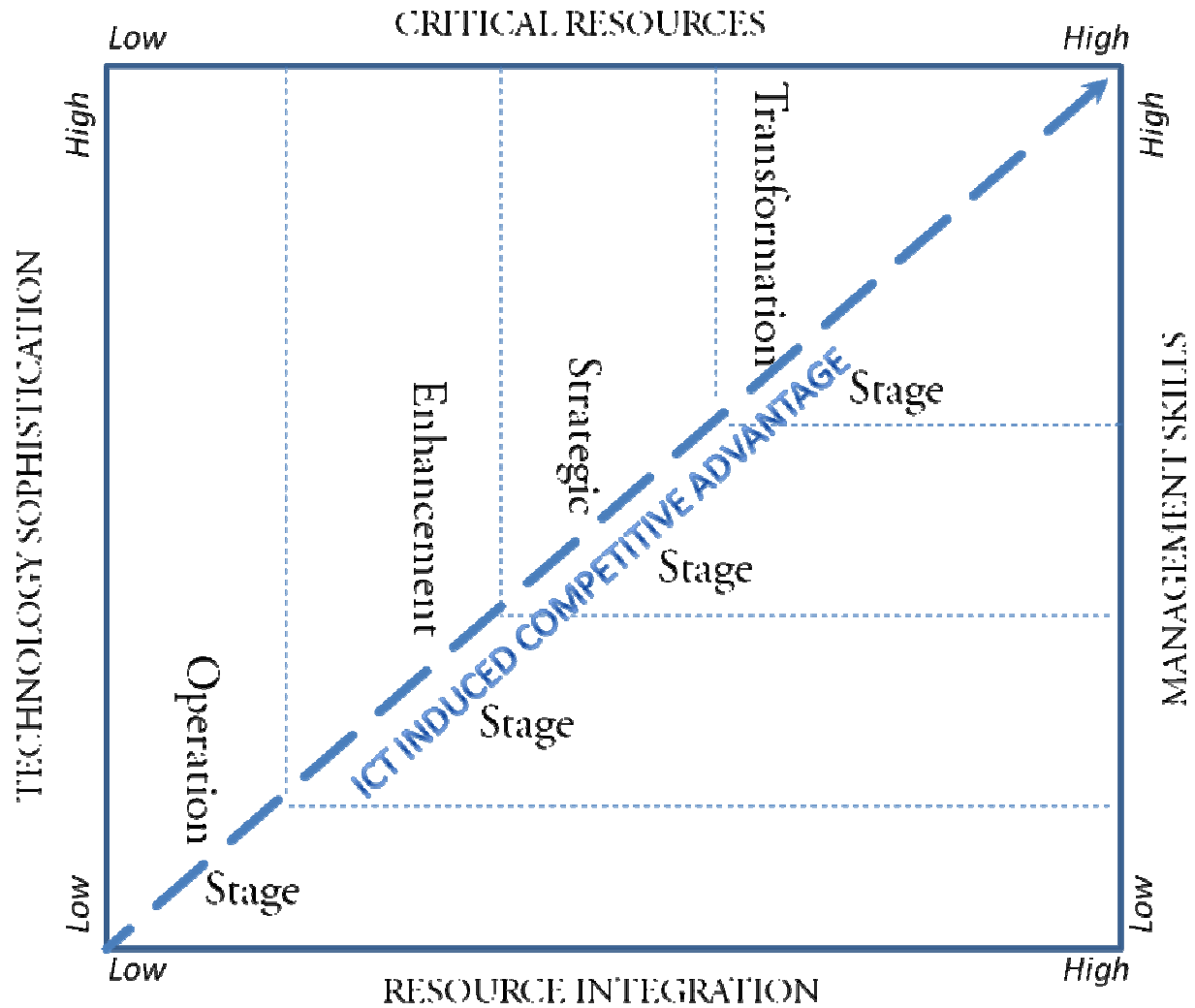


Figure 1. Proposed Framework

5. Findings

After discussions with the industry leaders, 4 different stages were supported. Table 1 represents the most common technologies that participants classified under each stage. Respondents indicated that management skills are critical for technology application selection, staff admission and training. One common theme was that managers need to be skilled in the extraction, analysis and leverage of information so as to better. Furthermore, all managers agreed that IT skills are necessary at every level of the management. It was also agreed that unless systems, people and strategy is aligned, no competitive advantage will result from it. Overall, it was found that critical resources should be allocated appropriately even in difficult economic times. Moreover, participants signified that technology sophistication is parallel with the IT-induced competitive advantage get. In all cases, it was clear that ability to recognize an innovative, promising, leading the future technology would ensure gaining a competitive advantage. Participants pinpointed that without appropriate resources; IT application cannot be selected, purchased and implemented. Any unique technologies that are very specific for a

company and that are hard to replicate and imitate would yield better IT-induced competitive advantage. Furthermore, technologies that both enable firms to generate revenue for firms and significantly enhance the guest experience would result gaining competitive advantage. Lastly, integration was listed one of the biggest challenges of the hospitality industry. Participants draw attention to the new standards such as HTNG, and OTA in order to cope with that challenge.

Interviews suggested that technology benefits in hospitality organizations occur in 4 different stages, there are different driving factors for the different technology stages: Operation, enhancement, strategic, and transformation respectively. Additionally interviews revealed the IT applications that are used in each stage.

5.1.1. Operation Stage

Technologies that manage daily operations are defined as operation stage. The goal of the operation stage is to keep the business running and going. In other words, technologies are used to meet the basic needs of a business. For instance, email communication is classified in operation stage. Similar to the substitution stage in Contractor's model, it only requires basic knowledge and doesn't offer significant competitive advantage. Additionally, this stage can be linked to the data processing era in Nolan's model (1979). Technologies in that stage require minimum management skills, and critical resources. Resource integration is very low in that stage; lastly, technologies used are not sophisticated. Firms start to pay attention to automation in this stage, thus improving efficiency. This stage present low sophisticated technologies that do not require high management skills and resources. Sigala et al. (2004) highlighted that the productivity impact of those technologies is zero or minimal. In this stage competitive advantage derived from ensuring the technology delivered a lost cost of routine transactions usually by replacing humans with machines. Respondents agreed that the technologies in this stage do not offer competitive advantage and companies should move forward to higher stages. Figure 2 is a word cloud of listed technologies in the operation mode.



Figure 3. Enhancement Stage

5.1.3. Strategic Stage

In the strategic stage, organizations achieve strategic competitiveness with aligning their technologies with overall organizational goals to set apart themselves from competitors. Technologies used at this stage strategically improve intra-organization and inter-organizational business processes in addition to enhancing productivity and efficiency at the Enhancement Stage. In addition, technologies used at this stage are helping hospitality organizations to achieve strategic goals, such as reducing costs, improving customer service, and adding more value to the organization through improved decision making processes. Customer Relationships Management (CRM), Computer Reservations Systems (CRS), Global Distribution Systems (GDS) are some tools used in tourism industry in the strategic stage. The tools in strategic stage could be used as a competitive weapon; however, they are such technologies that they could be duplicated by the competitors. Technologies in that stage both enhance the number of intra-organizational and inter-organizational processes. Competitive advantage depends on the creation of knowledge with the intention of providing value added value to customers. Customers are becoming more knowledgeable, demanding, and also asking for more personalized products and services. Hotels should gather and use guest information in order to provide more personalized services which could be managed by using CRM tools that are under that stage. Figure 4 is the word cloud of strategic mode

technologies.

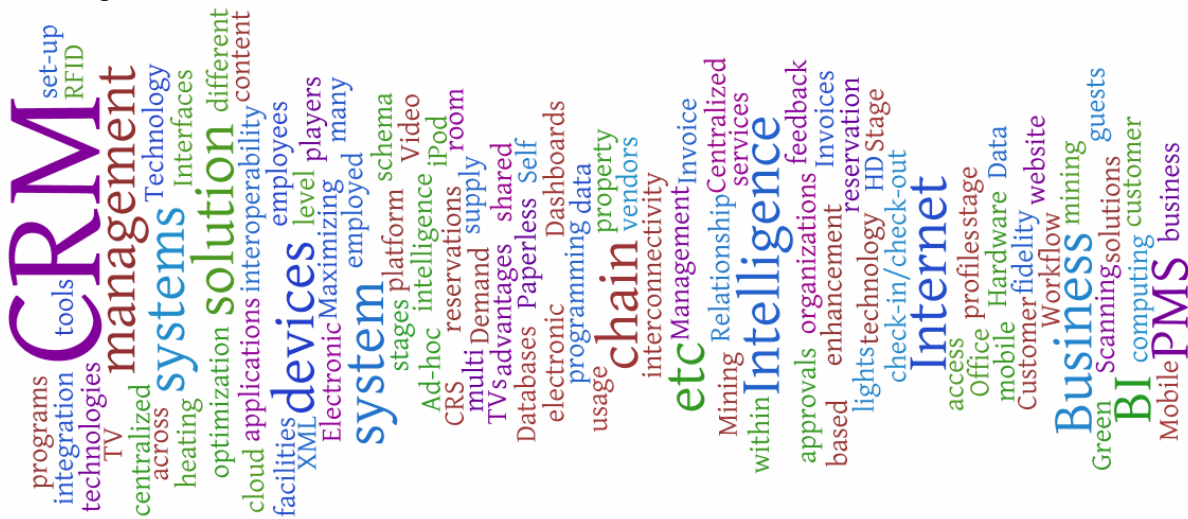


Figure 4. Strategic Mode

5.1.4. Transformation Stage

At the transformation stage, technologies are used in an integrative and synergistic manner in order to achieve ultimate competitive advantage. At this stage, integration and coordination of various technology applications/systems with maximum synergy are achieved so that business process and procedures are transformed in a way that long term competitive advantage can be achieved. The stage requires higher management skills. The resource integration is at the maximum level, at the same time critical resources in this and technology sophistication. Strategic alignment with the selected ITs are accomplished. Organizations' mission, vision, and goals perfectly match with the ITs. Moreover, these technologies are integrated with each other which enable such a variety of different approaches to solving organizations' needs. It enables organizations to collect a large amount of highly valuable guest data. PMS in a hotel that consists of different hardware and software all connected with both intra-organization and inter-organization ITs is an example of the transformation stage. Sigala et al. (2004) highlights that the availability of any F&B ICT does not affect F&B productivity. However, hotels having their F&B ICT integrated with their PMS had significantly higher hotel property operational productivity. ITs in this stage have evolved from simply interrelated components working together to collect, process, store and disseminate information to support decision making, coordination, control, analysis and visualization in an organization, to dynamic, interoperable mechanisms of collecting, processing and disseminating intelligence within organizations and in their extensive environment. Additionally shifting to embedded systems and individualized systems are key characteristics of this stage. Integrated systems, shared databases, systematically working technologies that work together to create synergy are required to reach that level.