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THE CONTEXT OF RESOURCE DECISIONS IN THE DIFFUSION OF INTERNET STRATEGIES IN LESS-DEVELOPED COUNTRIES: LESSONS FROM BOLSA DE VALORES DE GUAYAQUIL

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Abstract

This research examined how Bolsa de Valores de Guayaquil, a Latin American stock exchange, pioneered a strategy to reach global investors in Ecuador and educate its local market using the Internet. The paper focuses not only on the attributes of the innovation, but also on firm-specific capabilities to explain how combinations of competencies and resources were developed, deployed, and protected over the diffusion process. The research complements the diffusion of innovations theory by incorporating the “resource-based” view approach in the context of less-developed countries.

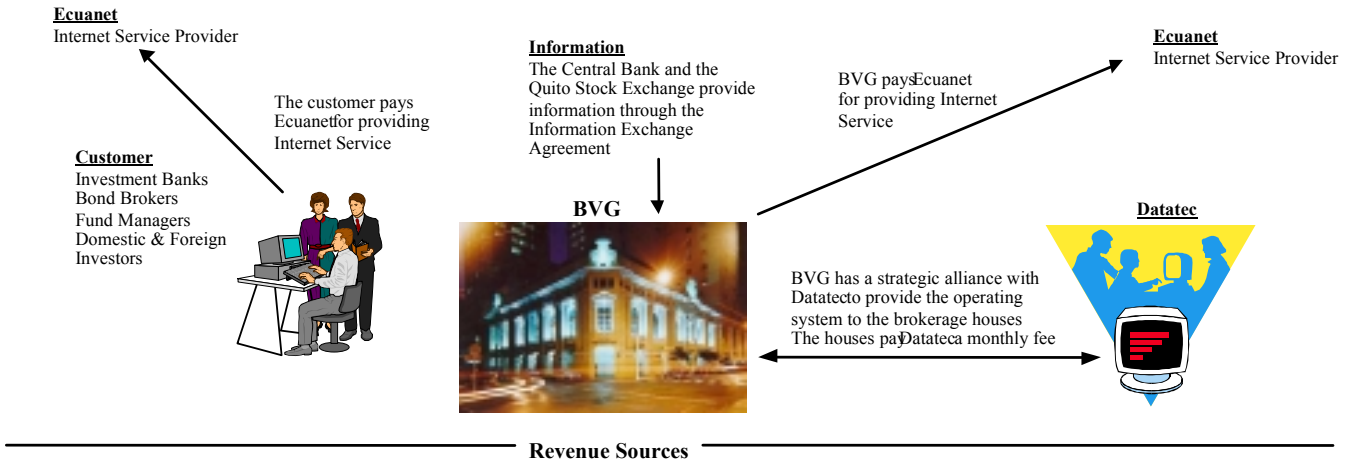
1. INTRODUCTION

The potential of the Web and the Internet as a global communication medium has been widely documented in both scholarly (Montealegre 1996; Press 1996) and trade publications (Elmer-Dewitt 1995; Verity 1994). The existing literature presents an aggregate story of success providing an interesting description of global technological diffusion. However, in the context of less-developed countries (LDCs)—where the environmental factors present much greater obstacles to information technology (IT) diffusion than in the developed countries (Montealegre 1997, 1998; Walsham, Symons and Waema 1988)—the picture is more clouded than we might have hoped. Little has been written about how a local firm overcomes these environmental factors and creates competitive value from adopting the Internet. Optimism is tempered by the awareness that most fundamental and technological progress is still “outside and has to be imported,” and that a process of “haves and have-nots” polarization is underway that could exacerbate differences among national groups, thereby aggravating the already existing gaps.

This research examines the process of Internet strategy formation and implementation, using as its basis an in-depth field study surrounding a Latin American stock exchange, Bolsa de Valores de Guayaquil (BVG). In 1996, BVG began providing static information about the stock exchange via the Internet. Then, in June 1997, it launched an organization-wide project, dubbed “Mundo Virtual,” aimed at exploring the interactive capability of the medium to attract foreign investors while capturing revenues from Ecuadorian institutional sponsors. During the same time, Ecuador suffered what has been described as the “most volatile years” of its history with political instabilities, structural reforms, low savings and investment rates, lack of capital, high inflation, and deteriorating public services.¹

The case illustrates that the Internet was perceived by BVG’s management as an innovation with a relative advantage that was triable, highly visible, and compatible with the firm’s past experience and existing information-based product offerings. Nevertheless, the firm’s ambitions had to be achieved with few people, modest IT facilities, and a small budget. The misfit

¹“Ecuador’s Post-Modern Coup,” *The Economist*, February 15, 1997, p. 37.



Revenue Sources			
<p>Membership Fees (includes access the BVG Statistics and the BVG guest book) Membership is based on the customer's equity. This expressed in Units of Value (UVC). UVC's are calculated by the Ecuadorian Central Bank based upon inflation rates.</p> <p>The first five million UVC pays 0.25 per thousand The second five million pays 0.20 per thousand The third five million pays 0.15 per thousand The fourth five million pays 0.10 per thousand Any surplus pays 0.05 per thousand</p>	<p>Product Sales "The Bulletin" Sold to Brokerage Houses Financial and Banking Markets and to the public sector. (Price in US Dollars)</p> <p>Daily Report (ACierrø) \$2,500 Monthly report (transparenci) \$350 Infoburati \$300 Capital (financial database of companies listed, available in software and print matter) \$500</p>	<p>Commissions</p> <p>Fixed Income Values Short term Fixed Income (< 365 days): 0.05% annual or \$4* Long term Fixed Income (>= 365 days): 0.10% fixed Corporate Bonds Primary Market Seller 0.175% fixed or \$4* Buyer 0.025% fixed or \$4* Secondary Market Seller/Buyer: 0.025% fixed or \$4* Variable Income Values Up to \$50,000,000: 0.10% Between \$50,000,000 and \$100,000,000: 0.075% More than \$100,000,000: 0.05% Term markets Term Operations 0.075% annual Custody for term operations (over the guarantee amount) 0.1% annual Note: The percentages are calculated over the effective value * whichever amount is higher</p>	<p>Advertisements/ Mundo Virtual</p> <p>Large size (Prime page) \$10,600 Large size (internal pages) \$6,400 Medium size (Prime page) \$5,000 Medium size (internal pages) \$3,000 Index - small size \$1,500</p>

Figure 1. BVG Economic Model

between BVG's resources and its aspirations would lead most observers to challenge the feasibility of its goals. Thus, its process of Internet strategy formation and implementation depended fundamentally on the context of resource decisions (Figure 1 summarizes BVG's economic model). In support of this premise, this research focused not only on the attributes of the innovation (relative advantage, compatibility, triability, complexity, and visibility), but also on firm-specific capabilities to explain how combinations of competencies and resources were developed, deployed, and protected over the diffusion process. This research provides an opportunity to complement the diffusion of innovations theory (Rogers 1995) by incorporating the "resource-based" view approach (Barney 1997; Teece, Pisano and Shuen 1997). The findings of this research should help researchers and managers better understand how a firm can build dynamic capabilities (such as business alliances, strategic foresight, and flexibility) to shape a marketplace and succeed in the process of fulfilling its Internet goals in a constraining and unstable environment.

2. THEORETICAL BACKGROUND

2.1 Diffusion of Information Technology in Less-developed Countries

The diffusion of IT in developed countries is well documented not only from the innovations diffusion perspective (Brancheau and Wetherbe 1990), but also from the broad managerial action perspective (Galbraith 1979; Kraemer and King 1981), the critical

mass perspective (Markus 1987), the organizational evolution perspective (Hirschheim and Klein 1992; McFarlan, McKenney and Pyburn 1983), the institutional perspective (Galbraith 1977; Kling and Iacono 1989), and the historical perspective (Mason McKenney and Copeland 1997). The innovations diffusion perspective, however, is particularly appropriate for this research because it includes considerations of the process by which diffusion and change occurs and the social context. It deals with the manner in which a new technological idea, artifact, or technique, or a new use of an old one, migrates from creation to use (Rogers 1995). Four important elements of the diffusion are (1) the innovation (relative advantage, compatibility, complexity, triability, and observability), (2) communication over channel, (3) the diffusion process, and (4) the social system.

In LDCs, managers face many of the same problems that affect organizations in developed countries, but they also have distinct difficulties. Austin (1990) suggests that given the fragile national contexts in which their organizations operate, managers who plan to introduce a new technology must systematically analyze the business environment in which that technology will be implemented. In particular, existing research on the IT diffusion to LDCs has recognized the need to develop skilled manpower (Bhatnagar 1992; Pawar 1991), to learn from the mistakes of other countries (Nilen 1983), to develop national IT policies (Bhatnagar and Odreda 1992; McFarlan 1992), to use proven technologies (Galvis 1989), and to employ consultants or develop international partnerships to import expertise along with the technology (Palvia, Plavia and Zigli 1992). However, most of these studies have emphasized “fit” or “adaptation” to local conditions. Past literature tends to highlight the importance of adapting information practices and IT implementations to the core competencies (including infrastructure) and values of a nation (Lachman, Nedd and Hinings 1994).

Recently, a number of authors have begun to challenge the focus of prior research on “fit” and “adaptation” (Montealegre 1997; Walsham, Symons and Waema 1988). The study presented here contributes to this recent “fit” versus “strategic intent” debate (Walsham 1993). Using the four elements of diffusion theory (i.e., the social system, the innovation, the diffusion process, and communication and channels of communications), the BVG case is analyzed to better understand how BVG was able to sustain the value of its key competencies in the face of radical and turbulent environmental changes.

2.2 The Resource-based View of the Firm

The resource-based approach sees a firm as a bundle of resources that are either tangible (e.g., financial assets, technology) or intangible (e.g., managerial skills, reputation) (Barney 1991, 1997). Resources are heterogeneous across firms, and some resources are valuable and rare, difficult to imitate, or nonsubstitutable. Firms with resources create core capabilities that distinguish them from others. Resources that provide sustainable advantage tend to be (1) *causally ambiguous* (e.g., transformational leadership), (2) *socially complex* (e.g., culture), or (3) *rare* (firm specific) (Barney 1997). In information systems, the resource-based view of the firm has been used to explain how firms can create competitive value from IT assets (Ross, Beath and Goodhue 1996) and how sustainability resides more in the organization’s managerial skills to leverage IT than in the technology itself (Mata, Fuerst and Barney 1995).

Although the resource-based perspective focuses on strategies for exploiting existing firm-specific assets, this perspective also invites consideration of managerial strategies for developing new capabilities (Wernerfelt 1984). A resource-based view proposes that external factors that impact the firm influence what resources are selected as well as how they are deployed. Whether resource selection and deployment results in enduring variation across firms will depend on factor market imperfections, defined as barriers to acquisition, imitation, and substitution of key resources or inputs (Barney 1991, 1997; Schoemaker and Amit 1994). When strategic factor markets are imperfect or incomplete, they create barriers to resource mobility and an unequal distribution of resources across competing firms (Dierickx and Cool 1989).

The traditional resource-based view, however, is limited to relatively stable environments. According to Barney (1997), “if a firm’s threats and opportunities change in a rapid and unpredictable manner, the firm will often be unable to maintain a sustained competitive advantage” (p. 171). Teece, Pisano and Shuen (1997) extended the resource-based view to consider the situations of rapid technological change. They developed the notion of dynamic capabilities and clarified the importance of “the firm’s ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments” (p. 516). The more rapid the technological change, the more that dynamic capabilities form the source of sustained competitive advantage (Teece, Pisano and Shuen 1997). The development of such capabilities is limited by the firm’s existing base of capabilities and is shaped by the firm’s current market position and past history of developing capabilities (Grant 1996; Teece, Pisano and Shuen 1997).

The extensions provided by the dynamic capabilities notion that stresses exploiting existing internal and external firm-specific competencies to address changing environments are particularly relevant in the context of LDCs. The BVG case provides an opportunity to investigate how it developed firm-specific capabilities and how it renews competencies to respond to shifts in the business environment—all issues that are intimately tied to the firm's business processes, position, and expansion paths.

3. RESEARCH STRATEGY

The research strategy can be broadly classified under an interpretive epistemology (Walsham 1993) using a single case study. The research strategy is consistent with the exploratory nature of the research questions: how the firm formulated and implemented the Internet-based strategy and why it succeeded in doing so despite a seemingly poor fit with the local environment. Given the contemporary nature of this case, extensive documentation was available, and key actors were easily located for interviewing. The data have already been collected.² The analysis of the data using the resource-based view of the firm and the reporting of the findings will be done during the summer of 1999.

The strategy for data collection involved multiple methods for collecting historical and longitudinal data. Interviews were arranged with BVG's complete group of middle and top managers (12 people), the leaders of the technology implementation (six people), Mundo Virtual users (27 users), and stock exchange experts and directors (15 people). All interviews were tailored to each person, focusing on the interviewee's perceptions of what happened and why, how decisions and actions were influenced and made, and how conflicts were resolved. Interviews also addressed the interviewee's role, attitude, and motivations. The interviews were tape recorded and transcribed, along with additional observations recorded at the time of the interview. Written data included both primary sources (annual reports, company archival analyses, organizational charts, strategic planning documents, minutes of meetings, "Mundo Virtual" documents, and internal correspondence and memos) and secondary sources (investor reports, industry and stock exchange documents, trade magazines, newspapers, and relevant Internet publications).

The data are being analyzed in several steps. First, notes taken from the documentation review were used to outline a broad picture of the background, the general path of the diffusion process, and the major decisions over time. Second, the interview transcripts were verified against the tapes. Third, data sources (multiple informants associated with the Internet initiative at BVG) and data collection methods (documentation and interviews) were triangulated to write the initial case descriptions. Rogers's four elements of diffusion theory—the social system, the innovation, time (the diffusion process), and communication and channels of communications—will be used to illuminate the process of Internet formation and implementation at BVG. Then the managerial and organizational processes, the specific asset position, and the paths available to BVG will be examined to identify firm-specific capabilities that were sources of IT strategy formation and implementation and to explain how combinations of competences and resources were developed, deployed, and protected over time. As Campbell (1975) recommends, pattern matching will be used to move back and forth between the empirical data and possible theoretical conceptualizations. The data analysis will be shared with the key informants within BVG in order to verify accuracy. The purpose of the study is not to provide generalizability of empirical results to other firms, but rather to "expand and generalize theories" (Yin 1989).

4. EXPECTED OUTCOMES

The fundamental difference between managing in a less-developed and a developed country is that in an LDC the environment is more challenging and carries more significant managerial implications (Austin 1990). Although the recent writings of the diffusion of innovations emphasize environmental change, the change is due to technical changes and global competition. In contrast, change in an LDC is often due to large societal and economic upheavals (e.g., the overthrow of governments, hyperinflation, ethnic clashes, or natural disasters) that are rather difficult to be shaped by even the most foresighted managers. One outcome of this study will be to uncover how a local information firm in an LDC can mold its environment. It is hoped that the findings of this effort will provide results that can be correlated with experiences in other organizational settings to produce cumulative knowledge.

²Those desiring access to the data collected to date are referred to the teaching case study published by the Harvard Business School Press, "Bolsa de Valores de Guayaquil (BVG): Reaching Worldwide Investors Through the Internet," Case No. 9-399-070.

Past research has assumed that under environmental jolts, a firm's core capabilities become obsolete and might even become "core rigidities" (Leonard-Barton 1992; Tushman and Anderson 1986). The BVG case, however, appears to suggest that the firm's capabilities and key resources might be strengthened as long as the executives have foresight to shape their external environment during the time of turbulence. Past work on the resource-based view has had an overly internal focus (Miller and Shamsie 1996). Among the exceptions are Hart (1995), who examined the role of natural environmental constraints on a firm's core capability development, and Miller and Shamsie (1996), who examined the value of resources under stable and unstable environments. This study will provide a perspective of a firm located in an LDC and will tie together elements of both these studies.

In an LDC context, responding to the environmental constraints as well as influencing them in a proactive manner is a key to success (Austin 1990). Dynamic capabilities play a central role in the process of IT diffusion. Under the dynamic capabilities view, the firm needs to develop dynamic capabilities to identify new opportunities and respond quickly to them; strategizing (aligning the company to its environment) is secondary (Teece, Paisano and Shuen 1997). This study should also be helpful in identifying strategies and tactics that managers can use to create such dynamic capabilities in LDCs, and in developing resource-based methods that can be used to help shape the local environment without threatening the societal culture. Hence, it has potential significance for moving the information systems research community away from its current North-American/European-centric perspective.

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