

Research Report

The Business Value of Colocation as an ICT Sourcing Strategy

ESPECIALLY IN THE FINANCIAL SERVICES INDUSTRY, FAST ACCESS TO COMMUNICATION NETWORKS AS WELL AS THE AVAILABILITY OF A HIGH-PERFORMANCE INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) INFRASTRUCTURE IS INDISPENSABLE TO ACCELERATE DIGITAL BUSINESS TRANSACTIONS BETWEEN GEOGRAPHICALLY DISPERSED ORGANIZATIONS. SINCE COLOCATION AS AN ICT SOURCING STRATEGY MAY LEAD TO INCREASED OPERATIONAL AGILITY, WE CONDUCTED AN EMPIRICAL STUDY TO INVESTIGATE THE POTENTIAL BUSINESS VALUE GENERATION.

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Introduction

Today, nearly all industry sectors and companies use the internet as a backbone for their business applications and processes operating in globally connected value chains and markets. Consequently, the competitiveness on an internet-based, global market increasingly depends on a fast and highly reliable ICT infrastructure. For example, electronic trading platforms for financial securities (i.e., algorithmic trading platforms) benefit from direct access to central internet exchange points which provide low network latency to stock exchanges world-wide. Since machines can react to changes in the market instantaneously, the speed of execution and prompt availability of real-time market data have become key success factors for traders

and investment bankers (Gsell, 2009). This is not only important for the financial institutions, but also for companies from other industry sectors, such as Internet Service Providers (ISPs), network carriers, wide area network (WAN) providers, e-commerce and logistics firms, as well as many other businesses which require fast access to communication and data networks and a reliable ICT infrastructure. In general, the ability to react quickly to market developments is becoming more and more important for many business models and their success (Sambamurthy et al., 2003).

While the internet is globally accessible, there are only a few major internet nodes in the world that are located in areas where high data

center capacity, reliable power supply, and high-performance ICT infrastructures, etc. are available, such as in New York, London, or Frankfurt (Tier 1 Research, 2009). Therefore, specialized colocation centers strategically located close to these locations provide basic data center services, such as space (e.g., for server racks), high internet bandwidth, reliable power supply, sophisticated cooling systems, and fire extinguishing solutions for customers who manage and operate their ICT systems themselves. The combination of being located at a major internet hub together with the availability of data center capacities attracts even more network carriers, WAN providers, and ISPs which, in turn, make these locations even more interesting for other customers due to network effects. This creates a competitive digital marketplace for ICT services for companies demanding redundant, high-speed internet access for their latency-critical business processes.

In this context, a colocation strategy is defined as the decision of companies to use colocation centers to leverage the ICT infrastructure made available by infrastructure providers and to utilize ICT services offered by the residing services providers. Moreover, colocation strategy adoption refers to the extent to which specific business activities of an organization are facilitated by the use of ICT infrastructure and services provided within a colocation center.

Colocation as an ICT Sourcing Solution for Financial Services Providers

An industry that benefits most from services provided by colocation providers is the finan-

cial services sector (especially in the areas of commodities and securities trading). The speed and reliability of the ICT infrastructures have become a critical element for the financial services sector since they accelerate the execution of trades significantly. Therefore, being under the same roof just a cross-connect away from relevant business partners may provide competitive advantage. In this context, the colocation sourcing strategy can help financial institutions to design, develop, and deploy ICT infrastructure solutions to meet the following challenges:

Speed and Scale – As the need for low-latency market data access and trade execution grows, colocation providers offer multiple high-performance interconnection points with close proximity to major liquidity providers in the world, like, e.g., New York, London, or Frankfurt. Scaling is another challenge for which colocation centers can provide an effective solution since they allow responding to increases in trade and market data volumes driven by financial volatility and regulatory authorities.

Ecosystem Access – Successful electronic trading operations are facilitated by the access to the right markets and liquidity providers. Due to this, colocation providers often house a large number of network carriers, WAN providers, ISPs, managed service providers, and specific extranets. These service providers improve the connection with the ecosystem of trade and post trade providers as well as the sell-and-buy side communities in leading financial markets.

Reliable and Cost-Effective – Colocation providers can also offer specific services to design and configure the data center space and power specifications to support the unique infrastructure needs of the customers. This customization ability helps to optimize capital expenditures. In an industry where downtime equals lost revenue, remote technical support for deploying, maintaining, and troubleshooting customers' IT equipment is crucial for their business success. Certified processes and procedures for security and monitoring, scheduled infrastructure testing, fast incident response, and proactive communication provide resilience and reliability for customers' operations.

Empirical Investigation

In order to empirically analyze the business value of a colocation strategy on an organizational level, a questionnaire-based field study was conducted. The study aimed at strategic decision makers from different German companies and industry sectors that have adopted a colocation strategy for at least one of the following business activities:

- (1) hosting of business-critical applications and platforms,
- (2) hosting of storage or storage area networks,
- (3) hosting of web pages, internet portals, e-business infrastructures, and
- (4) access to external ICT infrastructures (Point-of-Presence).

These four different business activities were identified by an expert panel as being especially appropriate and vital for the investigated industries.

In order to measure the business value of a colocation strategy, we identified operational agility as an appropriate dependent variable for our investigation. Therefore, based on the work of Dove (2001), we define operational agility as an *effective response ability in order to rapidly, efficiently, and accurately adapt to any unexpected (or unpredictable) change in both proactive and reactive business/customer needs and opportunities without compromising with the cost or the quality of the product/process*. Based on this definition, we operationalized "operational agility" as a dependent variable in order to capture the agility creation momentum of colocation strategy adoption primarily attributed to the operational level. For this purpose, the changes in agility of the four identified business activities introduced above were measured with regard to changes in responsiveness, cost-efficiency, speed, flexibility, quality, and effectiveness.

As discussed before, a colocation strategy provides several benefits for companies (i.e., for financial service institutions) in terms of improvements in agility on the operational level. Therefore, it is reasonable to assume that there is a positive relationship between the extent of colocation and operational agility. Hence, we propose:

Hypothesis 1: A higher extent of colocation leads to higher operational agility.

Moreover, we posit that in turbulent environments, which are characterized by rapid technological changes as well as a high hetero-

geneity and variability of the preferences and demands in the market, companies can further profit from colocation as a flexible ICT sourcing strategy. The capability to assess and respond appropriately to sudden changes is especially vital in turbulent environments as the variety of threats and uncertainties that can emerge is enormous. Organizations will need to leverage their ICT infrastructure in environments where their liquidity and therefore survival depends on the ability to anticipate the unexpected and react accordingly in uncertain conditions (Sambamurthy et al., 2003). Accordingly, environmental turbulence (measured by technological turbulence and market turbulence) can be considered as a moderator of the relationship between the extent of colocation and the agility realized by colocation strategy. A company needs to focus on the development and alignment of its resources and to apply them to the changing environmental conditions in order to be able to produce innovations and respond to environmental change in a cost-efficient and timely manner. A colocation strategy can be considered to be a means of supporting those adaptabilities through capacity and capability adjustments. Thus, the following hypothesis is proposed:

Hypothesis 2: In turbulent markets, colocation strategy adoption leads to higher operational agility compared to stable market environments.

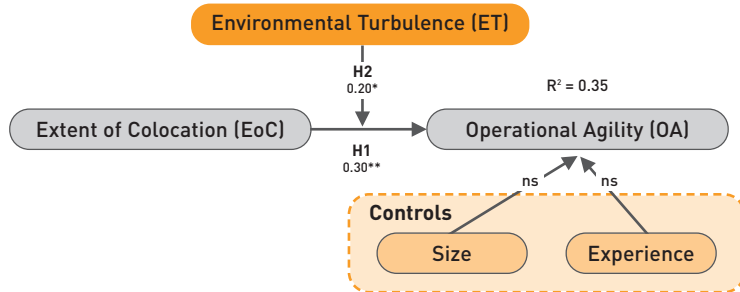
In order to account for differences among the investigated companies, different control variables, such as "company size" and "experience", were included.

Discussion of the Results

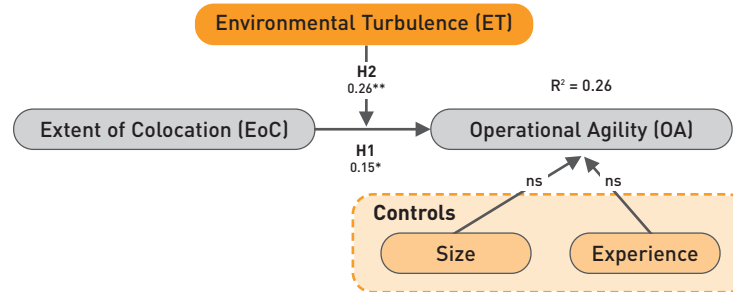
In October 2009, 1012 potential participants of a German business panel were invited to respond to a survey by filling out the questionnaire administered online. After one week, an email reminder was sent out to non-respondents. The potential participants were asked to completely fill-out the questionnaire to avoid missing values that can cause bias due to systematic differences between observed and unobserved data. In total, 142 responses were returned, indicating a response rate of 14 %. In order to investigate the adoption of colocation strategy in the different business activities, we divided the total sample into four sub-samples. Each subsample contains data of companies that have adopted colocation as an ICT infrastructure strategy for one specific business activity described above.

The results of our empirical investigation (depicted in Figure 1) clearly illustrate how the organizational adoption of a new ICT infrastructure strategy (i.e., sourcing of colocation services) leads to increases in operational business agility. Moreover, the survey data suggests that this relation is positively moderated by environmental turbulence. Accordingly, this study discovered that the adoption of a colocation strategy has a significant and positive impact on the agility of business activities in digital networks, resulting in increases in responsiveness, cost-efficiency, speed, flexibility, quality, and effectiveness of application, storage, and Web hosting, as well as access to external ICT infrastructure.

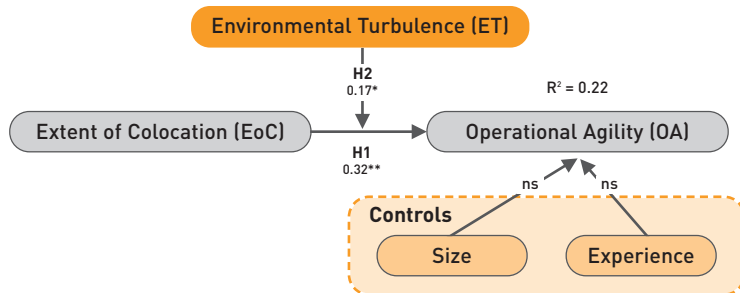
Application Hosting (n = 82)



Storage Hosting (n = 68)



Web Hosting (n = 92)



Access to External ICT Infrastructure (n = 86)

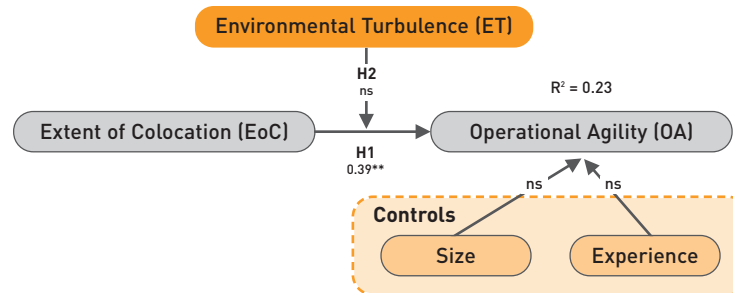


Figure 1: Empirical Results; ** p < 0.01, * p < 0.05 (two-tailed)

Exploring the relations more closely, the empirical results indicate that, in particular, a higher extent of colocation activities for the *access to external ICT infrastructure* leads to operational agility improvements due to efficient connectivity opportunities (direct access to different carriers, WAN providers, and ISPs). Moreover, Figure 1 shows that especially business *application hosting* benefits from colocation activities with respect to agility improvements. Flexible and scalable capacity adjustments as well as efficient and situational access to computing resources and a reliable

ICT infrastructure are of central importance for different kinds of business applications. Examples are electronic trading platforms (for commodities and securities), business intelligence applications (e.g., for risk management), as well as distributed (web-based) applications for mailing, messaging, and collaboration that need to be readily accessible from anywhere and anytime. This might also be an explanation for the comparably high path coefficients of the research model analyzing the hosting of Web pages, Internet portals, and e-business infrastructures (*Web hosting*). In contrast to this,

the relative low path coefficient for storage hosting indicates a lower positive impact from colocation sourcing activities on the operational agility of *storage hosting*. This might be due to the fact that outsourcing of business-critical data increases strategic risk (e.g., risk of industrial espionage) as well as operational risk (e.g., risk of intensified attacks on the “single point of failure”) that may lead to administration and security overhead, thereby lowering the operational agility of storage hosting.

With regard to the financial services industry,

the results indicate that companies operating in highly innovative and turbulent markets significantly benefit from colocation services compared to companies in stable market environments. The market turbulences are therefore beneficial for colocation service providers since potential customers are re-thinking their IT strategy and cost structure and might decide to use colocation services to reduce costs while improving their flexibility in terms of ICT infrastructure adjustments and collaboration opportunities. Especially as the need for low-latency market data and trade execution grows in financial markets, colocation providers offer an advantage by operating multiple high-performance interconnection points to strategic business partners.

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