

Causality of Factors Reducing Competitiveness of e-Commerce Firms

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Abstract: E-Commerce is widely recognized as a phenomenon that has exhibited unparalleled potentials to radically transform both local and global marketplaces. Searching for new opportunities, longing for flexibility to successfully address quickly emerging challenges, and gaining significant cost savings are among top incentives for companies to go online. As more and more companies adopt e-Commerce at a staggering rate, nearly two decades after the explosion of the e-Commerce 'Universe' in a rather 'Big Bang' manner, it becomes pretty obvious that achieving sustainable competitive advantages by avoiding the myriad of pitfalls intrinsic to the new paradigm, becomes an imperative, a 'holy grail' for online companies. How to become much popular than other e-Commerce firms? How to attract more potential e-Customers and retain the existing ones? The common thread underpinning the answer to all such questions is the complex and multidimensional construct of competitiveness, a synonymous to a firm's sustainable performance that can be achieved by meeting e-Customers' needs more efficiently and more effectively than other firms. However, contrary to the increasing volume of research made on this topic that takes into account competitiveness factors affecting e-Commerce firms in a somewhat 'positive' way, this paper aims to provide an insight into the factors that contribute to decreasing e-Commerce firms' competitiveness. Moreover, the paper introduces the concept of causality and tries to apply it vis-à-vis competitiveness factors using the technique of brainstorming and cause-and-effect diagrams. Visualization significantly improves the quality of the analysis and provides a suitable tool for communicating all of the possible causes that contribute to a complex problem, in this case, the reduced firm-level competitiveness. The proposed diagram-based approach provides a solid base of evidence that might support academics conducting case studies, comparative overviews and further research on this and similar topics.

Keywords: Firm-level competitiveness, e-Commerce firms, e-Commerce Websites, Ishikawa diagram, causality.

Introduction

During the recent few decades, globalization processes have imposed the emergence of a hyper-competitive era. The Internet and mobile computing have changed people's buying behavior all over the world, forcing most companies to provide online sales channels to their potential customers. To facilitate this process, businesses of all sizes have invested considerable amounts of money and resources into their e-Commerce strategies without taking into account all the key success factors related. As a result, many of them did not manage to survive the fierce competition on the global market. This fact has created the need for an explicit management of competitiveness, primarily firm-level competitiveness. Consequently, a considerable research has been done on competitiveness issues at different levels, using different approaches and frameworks.

Competitiveness of e-Commerce Firms

The concept of competitiveness has become extremely popular among managers, politicians, as well as academics in the recent years, although it was almost unheard-of three decades ago. In the modern economy, there are, actually, a number of definitions describing the multidimensional concept of competitiveness, which can be looked at from three different levels of aggregation: country (macro) level, industry/cluster level, and firm (micro) level. However, regardless of the point of view, the term means involvement in a business rivalry for markets.

In this paper, we focus solely on the firm-level competitiveness. It can be defined as "the capability a company has, to achieve profitability in the market in relation to its competitors" (EconomicPoint, 2013) or "the ability of firm to design, produce and/or market products superior to those offered by competitors, considering the

price and non-price qualities" (D'Cruz & Rugman, 1992). In other words, firm-level competitiveness is the ability of a firm to deliver products and services of superior quality and/or at lower costs than its domestic and international competitors. It is a synonym to a firm's sustainable performance and its ability to compensate its employees while generating superior returns to its shareholders (Buckley et al., 1988). According to the Government of United Kingdom's Department of Trade and Industry, firm-level competitiveness is "the ability to produce the right goods and services of the right quality, at the right price, at the right time. It means meeting customers' needs more efficiently and more effectively than other firms" (Budd & Hirmis, 2004).

Competitiveness depends on the relationship between the value and quantity of the outputs offered and the inputs needed to obtain profitability (productivity), as well as the productivity of the other bidders that exist in the market. In that context, a given company is considered a competitive one if it achieves "increased profitability due to the use of production techniques that are more efficient than those used by its competitors and which allow higher quantity and/or quality in its products or services or lower production costs per unit of the product" (EconomicPoint, 2013). Competitiveness, especially firm-level competitiveness, gains its relevance mostly due to the fact that both the survival and the success of firms operating in the contemporary business world increasingly depend upon the competitiveness factor, since "competition is at the core of the success or failure of firms" (Porter, 1985, p. 1). At a firm level, competitiveness is measured through both financial performance indicators (e.g. profitability, costs, productivity ...) and non-financial performance indicators (e.g. market share, the percentage of loyal customers and loyal suppliers ...). Generally, the term 'competitiveness' is considered synonymous with the term 'success', which can be defined as a fulfillment of company objectives. Hence, performance should be measured in terms of how an organization manages its critical success factors. Today, beyond financial or market-based indicators, measures of competitiveness increasingly include other variables, such as innovativeness, quality, and social ones like ethical standing, social responsibility, or working conditions of employees (Depperu & Cerrato, 2005).

Despite the fact that competitiveness of e-Commerce companies is a relatively novel research area, there are an increasing number of research papers on this topic recently.

In general, there are two major courses: (1) investigation of competitiveness of e-Commerce firms, including the identification and classification of corresponding critical success factors (CSFs); and (2) evaluation of the competitiveness of e-Commerce Websites by the application of corresponding mathematical/statistical methods, including the assessment of e-Commerce Websites' quality. Both of these are usually made on a general level, on a national/international level, on a specific industry level, and possibly, on a combination of the previous ones.

Addressing Causality through Cause-and-Effect Diagrams

Despite the fact that even ancient philosophers were aware of the concept of causality, it continues to remain a cornerstone of the contemporary philosophy, too. Aristotle was one of the first being puzzled by the famous "chicken or the egg" causality dilemma, which is commonly stated as "which came first: the chicken or the egg?" whenever there is a need to describe a situation in which it is difficult to tell which of two things happened first (Merriam-Webster, -). The dilemma, however, persisted through the ages: from Greek philosopher Plutarch and Roman scholar Macrobius to Christian philosophers like Augustine and St. Thomas Aquinas, medieval Italian natural historian Ulysse Aldrovandi, French philosopher Denis Diderot, and English naturalist Charles Darwin, still continuing to engage modern philosophers today, thus indicating the significance of this concept (Fabry, 2016). In fact, causality is an abstraction that shows how a given phenomenon progresses. Therefore, it necessarily reflects tightly the intrinsic conceptual structure of the phenomenon. Regardless of its nature, causality recognizes three constituent elements, including a cause, an effect, and a link that joins them together. Causality connects one process (the cause) with another process or state (the effect), where the first is understood to be partly responsible for the second, and the second is dependent on the first. Besides the fact that an effect can, in turn, be a cause of many other effects, which is, by the way, a self-similarity pattern found with fractals, causality is generally

accepted to be temporally bound, so that causes always precede their dependent effects, although in some contexts they may coincide in time (Heckman, 2008).

Still, contrary to the belief that causality is a natural way of thinking, we are conditioned to think about things in a rather different way. Whenever analyze a given phenomenon, humans usually generate a simple list of factors, totally neglecting the presence of causality among them. This way, following assumptions are recognized: (1) factors are independent, and (2) factors are equally important. However, these do not reflect completely the reality, since neither the factors are isolated from each other (i.e. there is almost always a cause-and-effect relationship among them), nor they are mutually equal (i.e. there are often hierarchies of factors belonging to different levels of significance and/or subordination).

The technique that is often used to address the concept of causality vis-à-vis a specific phenomenon is known as cause-and-effect (C&E) diagram. A cause-and-effect diagram originally examines why something happened or might happen, by organizing potential causes into smaller categories. Such causal diagrams show the causes of a specific event (Ishikawa, 1986). They can also be useful for showing key relationships among contributing factors so that the possible causes provide additional insights into process behavior. One of the seven basic tools of quality management¹, it is often referred to as an Ishikawa diagram (Fishbone diagram, Fishikawa diagram), after Kaoru Ishikawa (1915-1989), a Japanese University professor, and a proponent of quality management practices in industry, culminating in the publishing of this type of innovative diagrams in his books of the 1980s. One of the reasons cause-and-effect diagrams are also called Fishbone diagrams is because the completed diagram ends up looking like a fish skeleton with a fish head to the right of the diagram and bones branching off behind it to the left (Figure 1). The original Ishikawa diagram categorizes causes of problems/failures/non-conformities/defects found in the processes of manufacturing industry. The purpose of the diagram is to break down (in successive layers of detail) root causes that potentially contribute to a

particular effect. This can be usually achieved using the '5 Whys' approach, an iterative interrogative technique which is a cornerstone of brainstorming (Serrat, 2009). Formally being developed by Sakichi Toyoda (1867-1930), the technique strives to determine the root cause of a problem by successive repeating the question 'Why?' where the answer to each question is the root of the next question. Since not all problems have a single root cause, in order to uncover multiple root causes, the method should be repeated asking a different sequence of questions each time. However, since it does not provide any standardized rules about what lines of questions to explore, or how long to continue the search for additional root causes, even when the method is closely followed, the outcome still depends solely upon the knowledge and persistence of the analysts involved. On the other hand, brainstorming, being heavily popularized by the American advertising executive Alex F. Osborn (1888-1966), is probably one of the most well-known tools intended for solving creative problems, based on group creativity (Isaksen, 1998). It attempts to find out a set of conclusions underlying a specific problem by gathering a list of ideas, spontaneously contributed by a team of analysts.

The causes, usually being identified during brainstorming sessions, originally were divided into six main categories (a model known as 6M), including: (1) Materials; (2) Methods/Processes; (3) Manpower/People; (4) Machines/Equipment; (5) Mother Nature/Environment; and (6) Measurements. These categories are then subdivided into a number of primary causes (first hierarchical level) and secondary causes (second hierarchical level).

¹ The seven basic tools of quality management include Ishikawa diagram, histogram, Pareto chart, check sheet, control chart, flowchart, and scatter diagram.

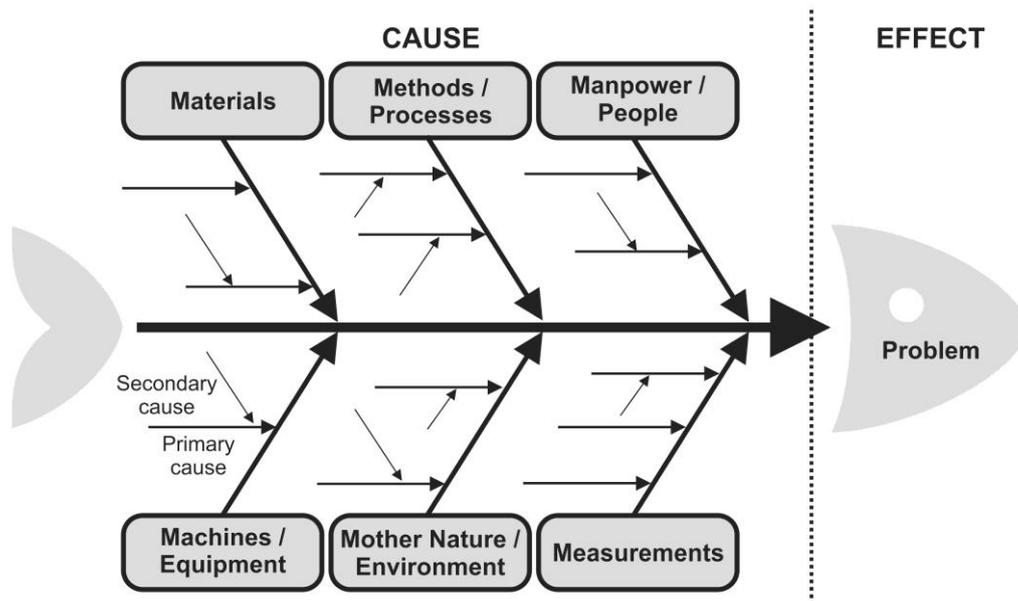


Figure 1. A generic representation of the Ishikawa diagram aka Fishbone diagram

Ishikawa diagrams are most commonly used not only for identification but also as a suitable technique for reducing or even eliminating problems. However, the use of these diagrams has now spread far beyond quality control, and they are used in other areas of management, as well as in design and engineering. In this particular case, we reach for Ishikawa diagrams to analyze factors reducing the competitiveness of e-Commerce firms in a cause-and-effect manner. The underlying idea for such an analysis comes out from the fact that not only many factors are triggered by others, but at the same time they also play the role of triggers for many others, comprising a complex chain of interdependencies and relationships among them.

Causality of Factors Reducing Competitiveness of e-Commerce Firms

Since the aim of this paper is to give a clear insight into the issues related to the causality of factors that strive to reduce competitiveness of e-Commerce firms, we utilize an integrated, inclusive, yet a holistic approach, which takes into account all organizational and technical issues, regardless of a specific industry or a country. A starting point to do so is the identification of all main areas that have to be systematically taken into consideration in the phases of building, deploying and managing any successful e-Commerce Website. Laudon & Traver (2009, p. 202) identify six crucial areas, including

(1) *Hardware architecture*, (2) *Software*, (3) *Telecommunications*, (4) *Website design*, (5) *Human resources*, and (6) *Organizational capabilities*. We hereby rely on the recent work done by Hristoski et al. (2017), who have made a thorough analysis of the factors affecting the competitiveness of e-Commerce firms according to the above-mentioned areas. The analysis of the reducing factors and their causality is carried out by utilizing the brainstorming method during repetitive sessions. The process is iterative in order to identify as many factors as possible and to organize them into a reasonable number of hierarchical levels.

Causality of Factors Reducing Competitiveness of Hardware Architecture

E-Commerce hardware architecture refers to the functionalities of the hardware components that are intended to be used: servers (web servers, database servers, ad servers, mail servers ...), proxy servers, load balancing systems, firewalls, encryption devices, internal LAN networks etc. From the perspective of hardware infrastructure, e-Commerce Websites are complex, large-scale, distributed, real-time, software-intensive and embedded systems in which performability is of a major concern.

According to Jawad & Johnsen (1995), *performability* is “a composite measure a system’s performance and its dependability. This measure

is the vital evaluation method for degradable systems - highly dependable systems which can undergo a graceful degradation of performance in the presence of faults (malfunctions) allowing continued 'normal' operation."

Performance is an indication of the responsiveness of a system to execute any action within a given time interval. It can be measured in terms of latency or throughput. Latency is the time taken to respond to any event. Throughput is the number of events that take place within a given amount of time (Microsoft, 2009, p. 198). Other specific performance metrics include resource utilization, supported number of concurrent users, page views rate etc.

In systems engineering, *dependability* addresses time-related quality characteristics of a system, i.e. it is a measure of a system's availability, reliability, and its maintainability, and, in some cases, other characteristics such as durability, safety, and security (IEC, -).

Availability is an important metric used to assess the performance of repairable systems, accounting for both the reliability and maintainability properties of a component or system. A wide range of availability classifications and definitions exist. For instance, instantaneous (or point) availability is the probability that a system (or component) will be operational (up and running) at a specific time, whilst average uptime availability (or mean availability) is the proportion of time during a mission or time period that the system is available for use (Weibull.com, 2017).

On the other hand, *reliability* describes the ability of a system or component to function under stated conditions for a specified period of time (IEEE, 1990). Put differently, it is the ability of a system to remain operational over time. Reliability is measured as the probability that a system will not fail to perform its intended functions over a specified time interval (Microsoft, 2009).

Maintainability is defined as the probability of performing a successful repair action within a given time. In other words, maintainability measures the ease and speed with which a system can be restored to operational status after a failure occurs (ReliaSoft.com, 2017). It is a measure of the ease with which a given system can be maintained in order to isolate defects or their cause, correct defects or their cause, repair

or replace faulty or worn-out components without having to replace still working parts, prevent unexpected breakdowns, maximize a product's useful life, maximize efficiency, reliability, and safety, meet new requirements, make future maintenance easier, or cope with a changed environment. Maintainability is the ability of the system to undergo changes with a degree of ease. These changes could impact components, services, features, and interfaces when adding or changing the functionality, fixing errors, and meeting new business requirements (Microsoft, 2009).

According to Oakes (2009), *safety* involves whatever contributes to maintaining the 'steady state' of a social and physical structure or place in terms of whatever it is intended to do. 'What it is intended to do' is defined in terms of public codes and standards, associated architectural and engineering designs, corporate vision and mission statements, and operational plans and personnel policies. For any organization, place, or function, large or small, safety is a normative concept. It complies with situation-specific definitions of what is expected and acceptable. Safety connotes stability over time, continuity of function and reliability of structure.

Finally, *security* is either the process, or means, physical or human, of delaying, preventing, and otherwise protecting against external or internal dangers, defects, dangers, loss, criminals, and other individuals or actions that threaten to weaken, hinder or destroy an organization's "steady state", and otherwise deprive it of its intended purpose for being (Oakes, 2009). It refers to the capability of a system to prevent malicious or accidental actions outside of the designed usage and to prevent disclosure or loss of information. A secure system aims to protect assets and prevent unauthorized modification of information (Microsoft, 2009).

Besides the above mentioned, our analysis also includes *scalability*, which is highly important concept vis-à-vis e-Commerce systems. Scalability is the ability of a system to either handle increased workloads without impact on the performance of the system, or the ability to be readily enlarged (Microsoft, 2009).

It is also worthy to mention that the viability of any e-Commerce system is underpinned by a number of additional features, including durability, recoverability, conceptual integrity,

reusability, interoperability, manageability, supportability, testability, usability etc. We deliberately omit these due to space limitations.

The resulting Ishikawa diagram which portrays causality of factors reducing the competitiveness regarding the e-Commerce hardware architecture is depicted in Figure 2. The diagram is built on a set of specific *system features*, being elaborated previously.

Causality of Factors Reducing Competitiveness Regarding Software

Successful running of e-Commerce business cannot be imagined without a corresponding

Web-oriented architecture (WOA), being carefully deployed through the phases of logical design, building (from scratch, using packaged Website building tools, or using pre-built templates), testing, implementation, and maintaining. It is a software architecture style that extends service-oriented architecture (SOA) to Web-based applications in accordance with the *client-server model*, a distributed application structure that partitions tasks or workloads between the providers of a resource or service, called *servers*, and service requesters, called *clients*, over the Internet.

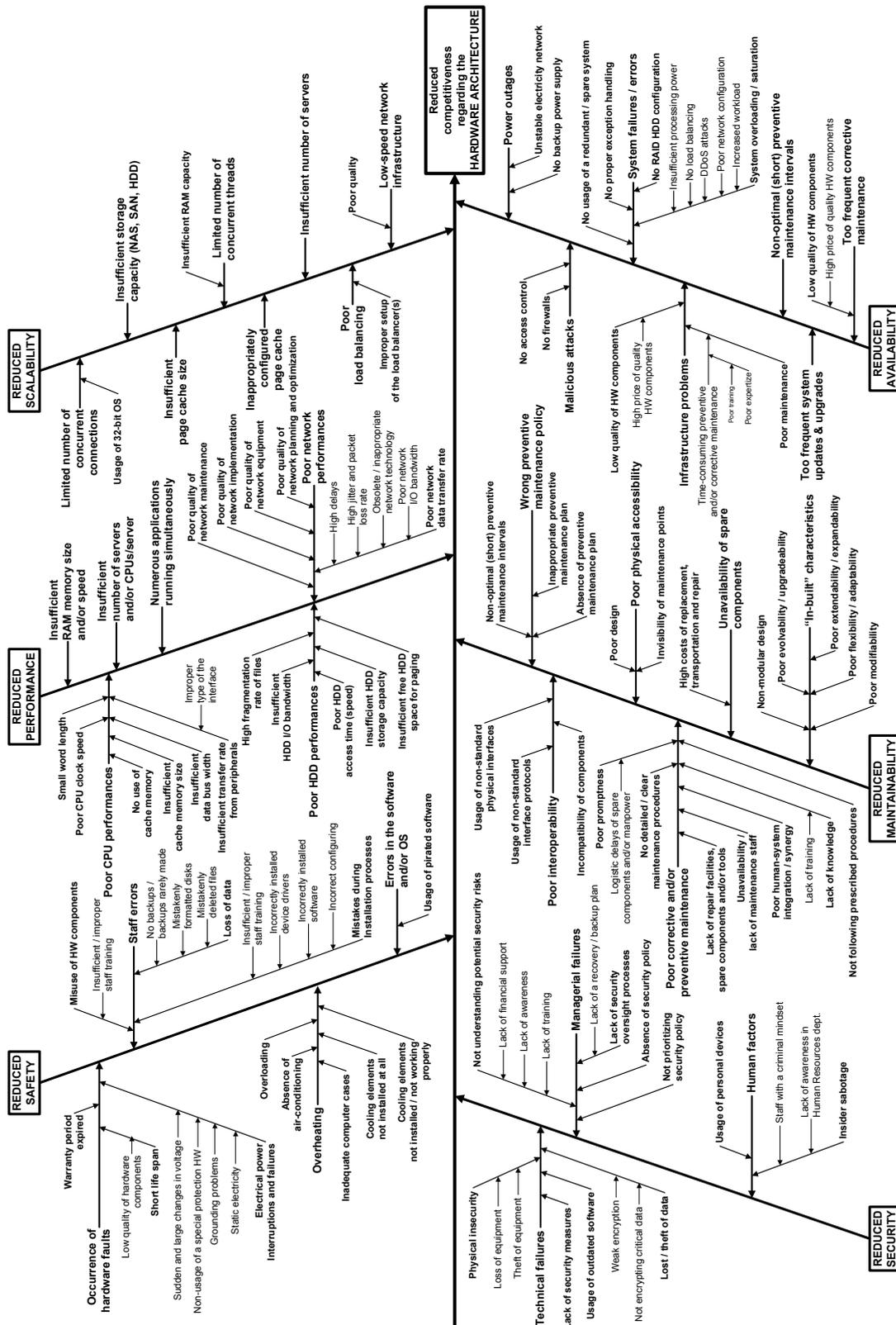


Figure 2. Cause-and-effect diagram depicting the factors that reduce competitiveness vis-à-vis hardware architecture in e-Commerce (authors' representation)

Moreover, such software architecture is usually multilayered, in which *presentation*, *application processing*, and *data management* functions are physically separated, thus providing a superb platform for flexible and reusable Web applications. It is comprised of different software components, which exhibit a multifaceted functionality: (1) *Web communications software*, encompassing all the applications that allow interaction with e-Customers via HTTP, (2) *e-Commerce software*, the engine of the online store, making it possible to easily manage inventory, add or remove products, calculate taxes, and everything else required to manage and fulfill orders, (3) *Utility software*, intended for maintaining and managing all the software components up and running, and (4) *Web analytics software*, intended for measurement, collection, analysis and reporting of Web data for purposes of understanding and optimizing e-Commerce Website usage and traffic, including tracking of e-Customers' online behavior through a set of Key Performance Indicators (KPIs).

Hereby we focus on three types of software specific to e-Commerce, including a Web server, Application servers, and E-Commerce Merchant server (Laudon & Traver, 2009, pp. 215–226).

Web servers are programs that use HTTP (Hypertext Transfer Protocol) to serve files (i.e. HTML documents) that form Webpages to Internet users, as well as Web services, in response to their requests, which are forwarded by their computers' HTTP clients (i.e. Web browsers). E-Commerce Web servers often come as part of a larger package of Internet-related programs for serving e-Mail, downloading requests for File Transfer Protocol (FTP) files, and building and publishing Web pages.

Application servers are software programs that provide specific business functionalities required of a Website, by isolating business applications from the details of displaying Web pages to users on the front-end and the details of connecting to databases on the back-end.

E-Commerce Merchant server software provides the basic functionality needed for online sales, including an online catalog, order taking via an online shopping cart, and online credit card processing.

We address the most prominent factors reducing the competitiveness vis-à-vis aforementioned types of software with the Ishikawa diagram presented in Figure 3. Note that contrary to the previously introduced cause-and-effect diagram, which was built on a set of specific (hardware) *system features*, this one is built on a set of specific (software) *architectural components*.

Causality of Factors Reducing Competitiveness Regarding Telecommunications

Telecommunication services are crucial for running e-Commerce businesses. Companies offering telecommunications services operate or provide access to facilities for voice, data, text, sound, and video transmission through wired, wireless, or satellite networks, including the Internet. These companies create the infrastructure that allows data to be sent anywhere in the world. The major segments within the telecommunications sector are wireless communications, communications equipment, processing systems and products, long-distance carriers, domestic telecom services, foreign telecom services and diversified communication services. Other than the service providers, smaller companies in the telecommunications sector sell and service the equipment, such as routers, switches, and infrastructure, which enable this communication.

Since the area of telecommunications, which is crucial to e-Commerce activities, belongs to the service industry, we use the famous 4S model to address causality of corresponding factors reducing competitiveness in this area.

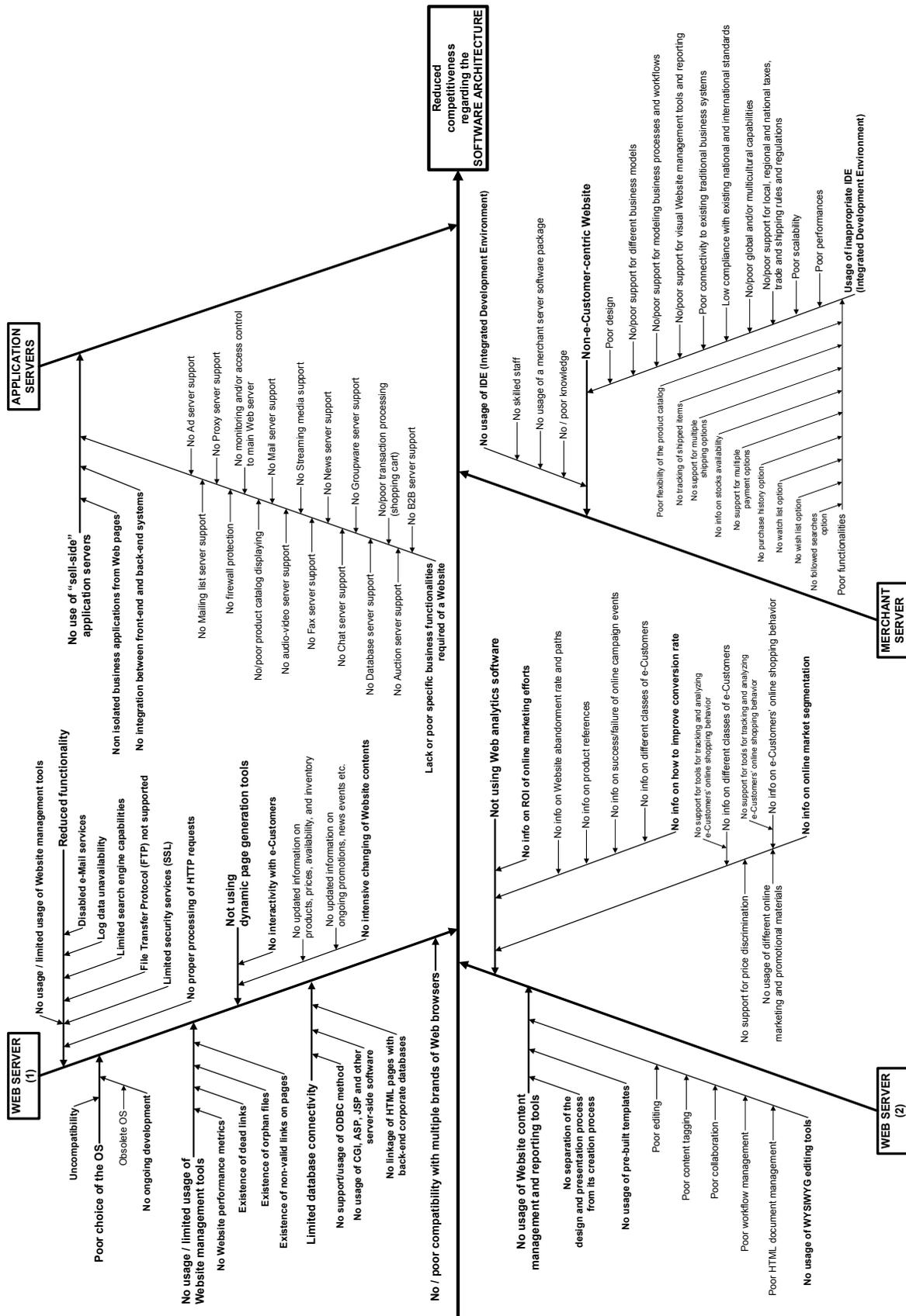


Figure 3. Cause-and-effect diagram depicting the factors that reduce competitiveness vis-à-vis software in e-Commerce (authors' representation)

The 4S model one of the *traditional categories* of the Ishikawa diagram, commonly used in the service industry, and it organizes information about potential causes into four common categories: *Surroundings*, *Suppliers*, *Systems*, and *Skills*. The resulting C&E diagram is shown in Figure 4. In this particular context, the aspect of *Surroundings* refers to issues related to the environmental factors regarding telecommunications that neither can be controlled by nor depend on e-Commerce firms. The aspect of *Suppliers* refers to issues regarding the factors affecting outer subjects that deliver a number of telecommunication services to an e-Commerce firm. The aspect of *Systems* refers to all issues dealing with the physical devices – equipment providing the required functionalities. The aspect of *Skills* refers to questions about the working experience and training of employees apropos telecommunication services.

Causality of Factors Reducing Competitiveness Regarding Website Design

The complex processes of Website planning, creation and updating are known as Website design. The meaning of it is multidimensional and includes aspects like Website structure, Website layout, information (contents) architecture, user interface, navigation, colors, contrasts, fonts and imagery (photography) as well as icons design. All of the previously mentioned elements, combined together, comprise what is known as *visual aspects*. In addition, visual aspects also include contrast, coloring, balance, emphasis, rhythm, style of graphical elements (lines, shapes, texture, color and direction), and icons, background textures, and general atmosphere of overall Website design. However, in reality, the concept of Website design is also associated with more *abstract aspects* such as usability, accessibility, privacy, ergonomics, active content, interactivity, online tracking of user habits and online behavior, online user experience, personalization,

customization, and navigation logic, which altogether strive to simplify the usage of Websites and help finding information faster. Besides these, contemporary Website design also involves a number of *technical aspects*, i.e. server-side scripting is carried out by technologies like PHP, ASP and CGI, Websites' layout and visual appearance are defined with HTML and CSS, whilst user experience is enhanced with dynamic JavaScript and AJAX. All these elements are combined with the fundamental principles of design in order to create a superb result that meets the goals set for a given Website.

When talking about the Website design in e-Commerce, it is crucial to get a coherent design fully oriented towards e-Customers, i.e. a design that would not necessarily excite them with its visual elements, but rather a design that would enable doing a smooth, efficient and safe online business. The ultimate goal is, hence, to get an e-Commerce Website that should be easily handled and worked upon by e-Customers without any hassles or confusion. This is because e-Commerce Websites are the first and only interface between e-Customers and online sellers, their single visit card and their best assistant, i.e. the perceived image of their e-Commerce firm.

Figure 5 portrays an Ishikawa diagram encompassing the most important design-related factors that contribute towards reducing competitiveness. These include factors being generated by the *external environment* and factors that come from the *intrinsic features* of the Website design, whilst a special emphasis is put on the factors related to *Website optimization*. Website optimization is an extremely important issue, especially in e-Commerce, since it produces highly competitive Websites that outperform on every measure: Web traffic, communication speed, conversion rates, sell-throughs, and, most importantly, return on the investment (King, 2008).

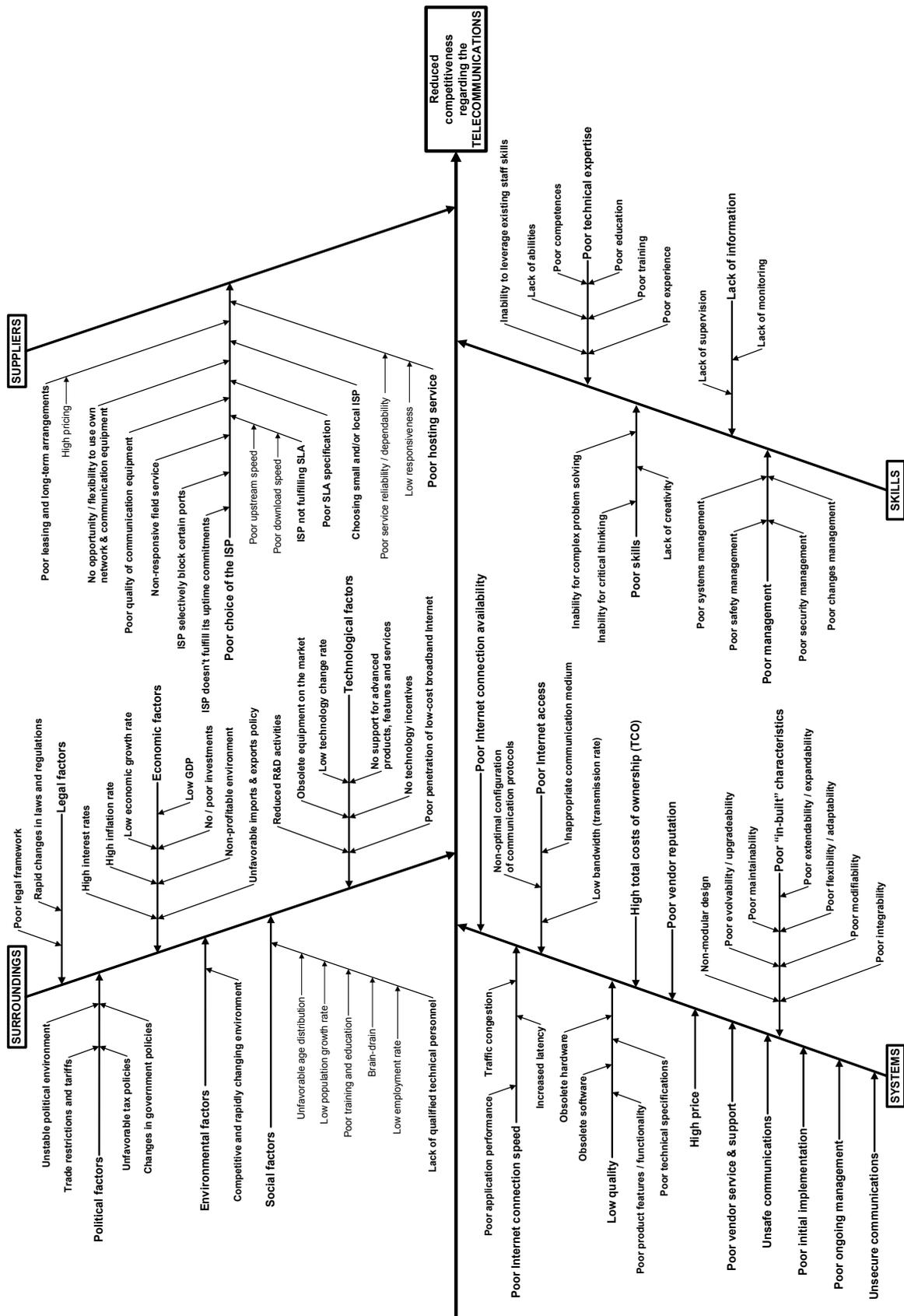


Figure 4. Cause-and-effect diagram depicting the factors that reduce competitiveness vis-à-vis telecommunications in e-Commerce (authors' representation)

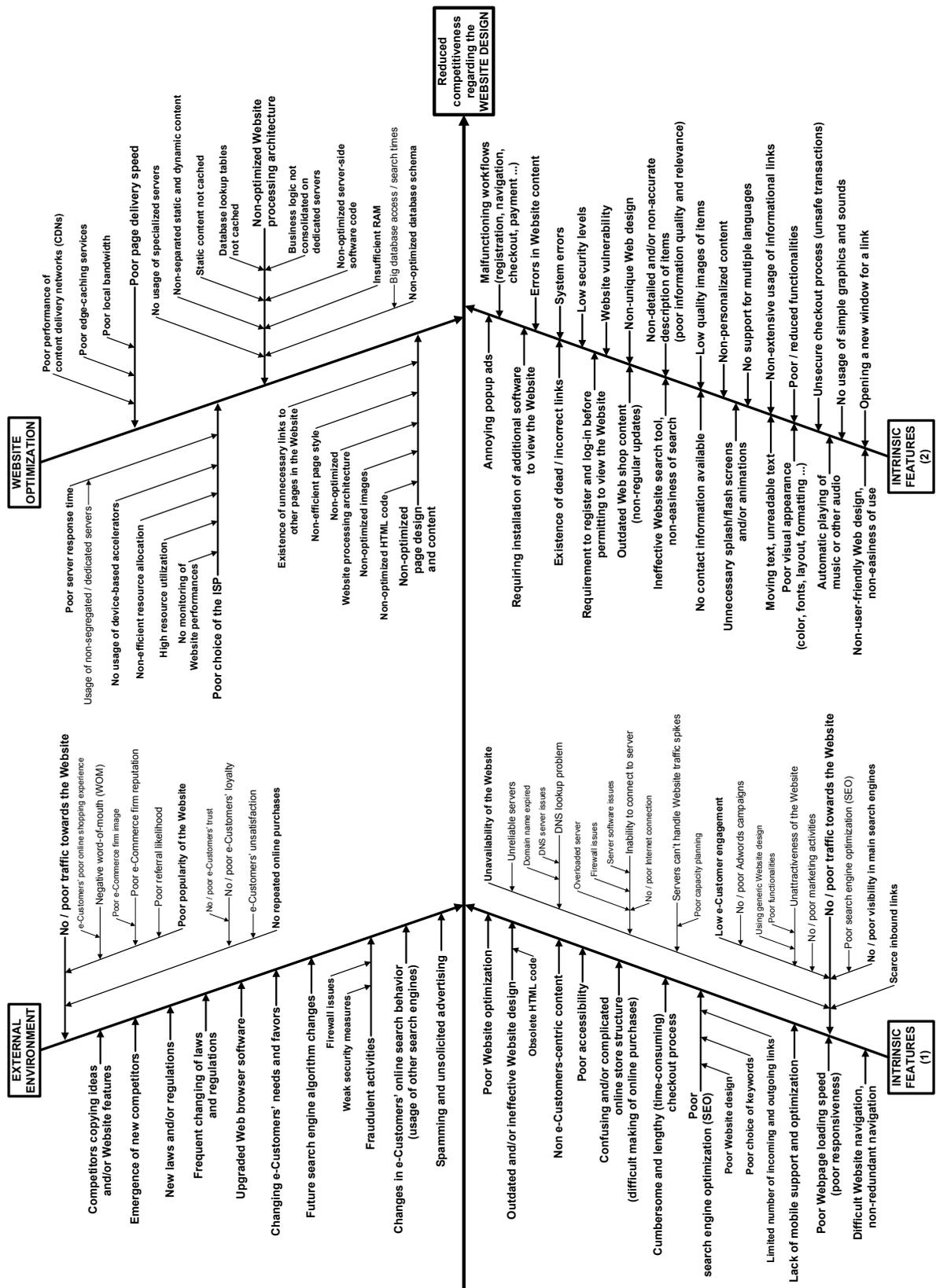


Figure 5. Cause-and-effect diagram depicting the factors that reduce competitiveness vis-à-vis Website design in e-Commerce (authors' representation)

Causality of Factors Reducing Competitiveness Regarding Human Resources

Despite the fact that business in e-Commerce is driven by technology, the human element continues to play a pivotal role in new-age economies, making the role of human resources (HR) more dynamic and challenging. Dynamism and unpredictability are two crucial aspects of this industry, which bring in their own set of challenges for HR. According to Saha (2015), a big challenge for the e-Commerce industry is that it doesn't have a readily employable workforce to rely on, i.e. "it has to employ people who are the closest fit, train them, make them conducive to the new environment and also constantly motivate them to be able to retain them for the longest period." Therefore, the most critical role for HR in e-Commerce is to identify and hire the right people, with right knowledge and skills, at the right time, for the right job. In order to achieve this goal, e-Commerce has to borrow talents from other sectors and mold them in the new environment. Hence, skill development and training programs are prerequisites for new hires. In addition, since e-Commerce industry works 24x7, 365 days per year, the workforce is on the job round the clock, whilst their flexibility becomes a key attribute not only of the e-Commerce working culture but also of the e-Commerce competitiveness. In such circumstances, keeping the firm policies as transparent as possible, as well as keeping the workforce highly motivated by ensuring that they work in a favorable, yet inspiring and stimulating environment to fully enjoy their job responsibilities and exhibit their true potentials is a crucial premise to e-Commerce success.

Human resources reside in the *knowledge, skills, abilities, and motivation* of people. Human resources, under right conditions, improve with age and experience, which no other resource can do. It is therefore regarded as the scarcest and most crucial resource that creates the largest and longest lasting competitive advantage for an organization (BusinessDictionary, –). For many people, knowledge and skills are similar concepts used to describe competency. However, they should be considered as two quite different, yet related concepts (Boulet, 2015).

Knowledge is the theoretical understanding of a subject, information acquired through sensory

input: reading, watching, listening, touching, etc. The concept of knowledge usually refers to familiarity with factual information and theoretical concepts. Knowledge can be transferred from one person to another or it can be self-acquired through observation and study.

Skills are the practical proficiencies developed through training or experience, something that has been learned or developed through the transfer of knowledge. Skills refer to the ability to apply knowledge to specific real situations. They are developed through practice, through a combination of sensory input and output: interaction, observing, listening, and speaking. Trial-and-error is considered the best way to achieve skills mastery.

Abilities are the qualities of being able to do something, a possession of the means (talents, proficiency, and expertise) to do something in a particular area.

A cluster of related knowledge, skills, and abilities that enable a person to act effectively in a wide variety of situations is known as *competence*.

Motivation is a theoretical construct used to explain behavior. It gives the reason for people's actions, desires, and needs. Motivation can also be defined as one's direction to behavior or what causes a person to want to repeat a behavior and vice versa (Elliot & Covington, 2001).

The cause-and-effect diagram that takes into account *Knowledge, Skills, and Motivation* of human resources in e-Commerce is presented in Figure 6. Again, this particular Ishikawa diagram is based on a set of *specific (human) features*.

Causality of Factors Reducing Competitiveness Regarding Organizational Capabilities

E-Commerce firms are rapidly building their Web presence in an attempt to take advantage of the tremendous potentials, new opportunities, and competitive advantages provided by the new business paradigm. Nonetheless, the investment in e-Commerce is more than just developing a Website. It is imperative that organizations take a comprehensive, yet a holistic look at both the cross-functional and technical capabilities required to execute their strategy and enable the ideal e-Customer online shopping experience in their e-Commerce channel. These include (1)

Internet marketing, (2) User experience, (3) Content management, (4) Product management and merchandising, (5) Integration, (6) Warehousing and fulfillment, (7) Customer support, and (8) Governance and metrics (BakerTilly, 2014).

In general, *capability* is a measure of the ability of an entity (department, organization, person, and system) to achieve its objectives, especially in relation to its overall mission (BusinessDictionary, -).

According to Kelchner (-), *organizational capability* is “a company’s ability to manage resources effectively to gain an advantage over competitors”. In line with previous, Kelchner points out that “company’s organizational capabilities must focus on the business’s ability to meet customer demands. In addition, they must be unique to the organization to prevent replication by competitors. Organizational capabilities are anything a company does well that improves business and differentiates the business in the market. Developing and cultivating organizational capabilities can help small business owners gain an advantage in a competitive environment by focusing on the areas where they excel.” To be more precise, organizational capability refers to “ability and capacity of an organization expressed in terms of its (1) Human resources: their number, quality, skills, and experience, (2) Physical and material resources: machines, land, buildings, (3) Financial resources: money and credit, (4) Information resources: pool of knowledge, databases, and (5) Intellectual resources: copyrights, designs, patents, etc.” (BusinessDictionary, -).

Gryger et al. (2010) define the organizational capability as anything an organization does well that drives meaningful business results. However,

a recent research has shown that despite the fact that building organizational capabilities is a top priority for most companies, yet only a third of companies actually focus their training programs on building the capability that adds the most value to their companies’ business performance (Gryger et al., 2010). Lately, The Boston Consulting Group (BCG) developed a framework of 20 organizational capabilities that highlight vital structural and behavioral capabilities that drive success (Roghé et al., 2012). Their research results reveal that behavioral capabilities - strong leadership, engaged employees, and a collaborative culture are vital for success. They also detect significant correlations between these capabilities and a company’s ability to create value.

Our proposed Ishikawa diagram (Figure 7), which addresses organizational capabilities, includes relevant factors belonging to six categories, including *Strategy, Marketing, Logistics, Customer relationships, Management, and Business processes*. Since the category of *Marketing* is too complex to be presented along with the other categories, we present its content in a separate cause-and-effect diagram, shown in Figure 8. Another reason to do so is the fact that in the marketing industry, cause-and-effect diagrams often consist of 7Ps: *Product, People, Process/Procedure, Promotion, Price, Packaging, and Place*. Again, this is one of the *traditional categories* of Ishikawa diagrams (Figure 8). Since the category *People* belongs to the area of *Human Resources*, which has already been described previously, we deliberately omit this lattice from the diagram. In addition, we intentionally omit the analysis of the factors that belong to the category *Place*, since it is intrinsic to traditional commerce, but not to e-Commerce paradigm.

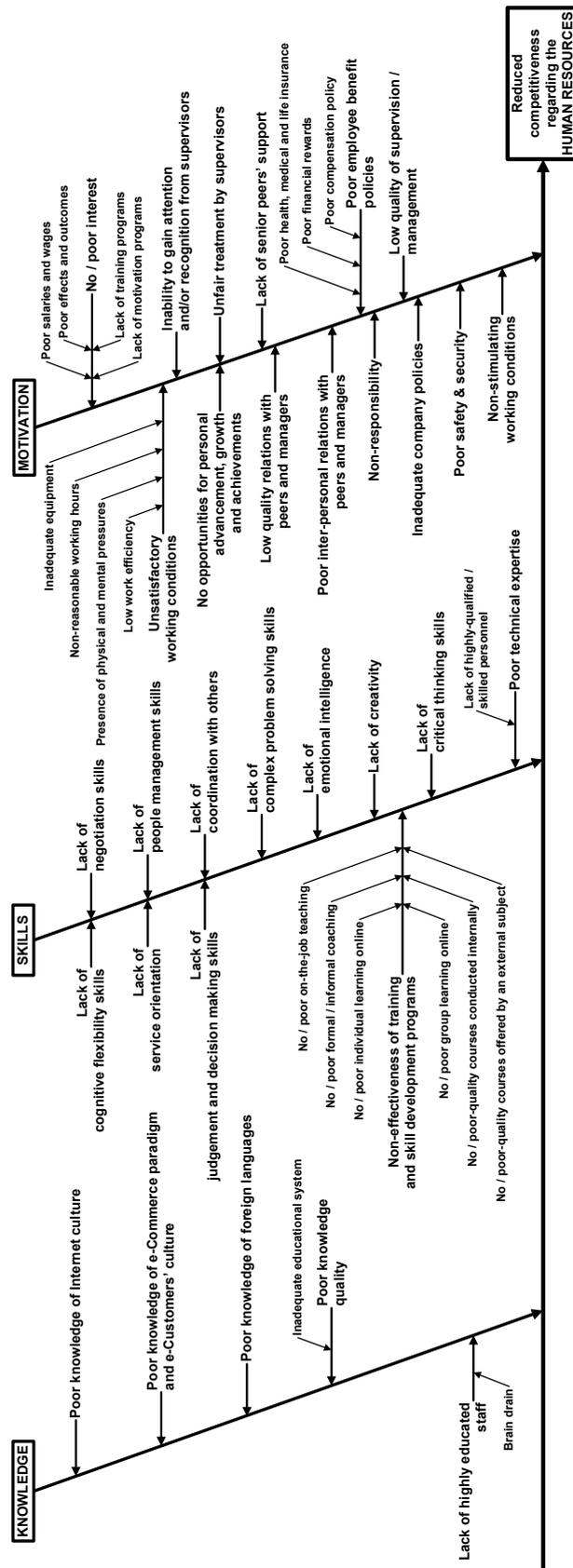


Figure 6. Cause-and-effect diagram depicting the factors that reduce competitiveness vis-à-vis human resources in e-Commerce (authors' representation)

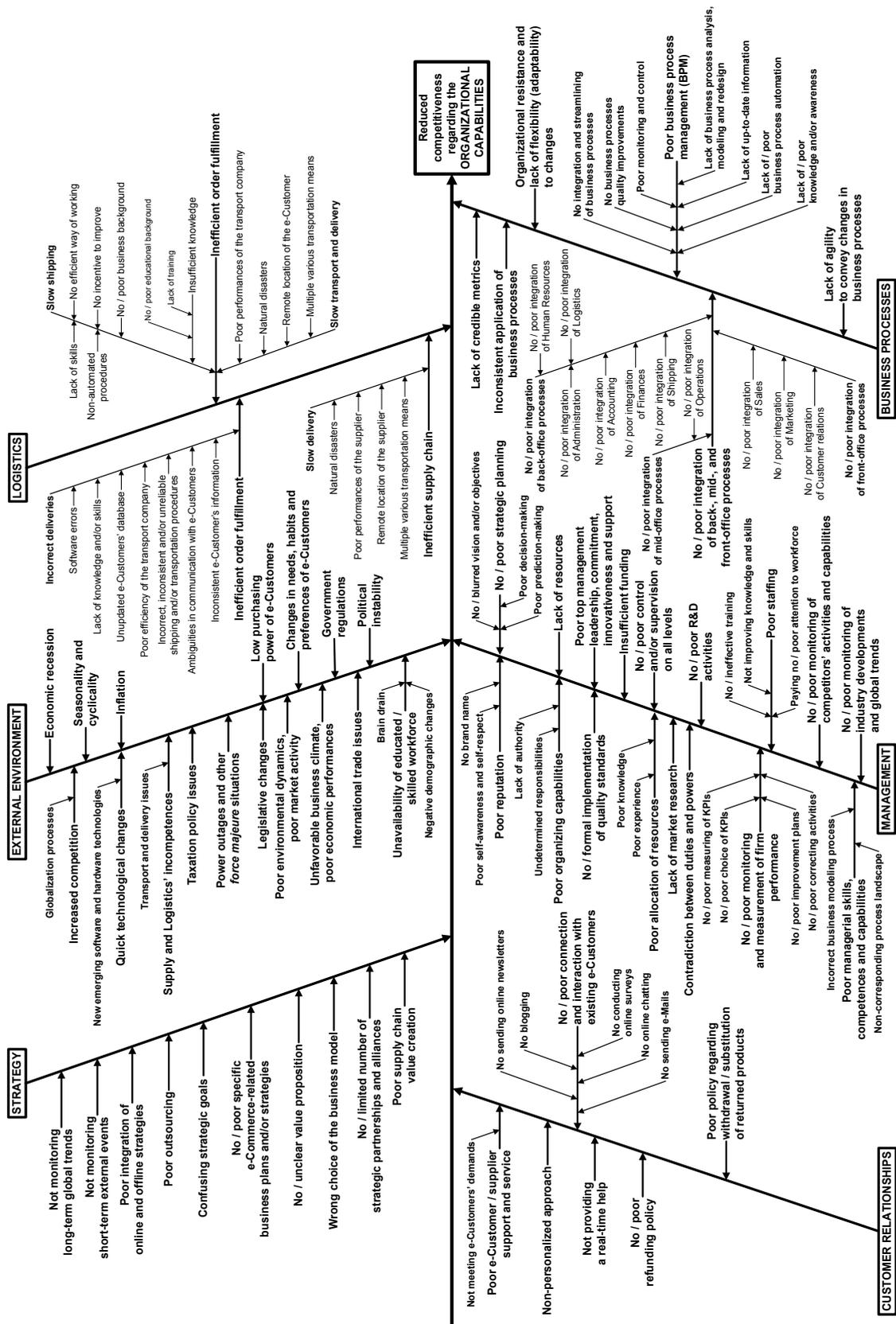


Figure 7. Cause-and-effect diagram depicting the factors that reduce competitiveness vis-à-vis organizational capabilities in e-Commerce (authors' representation)

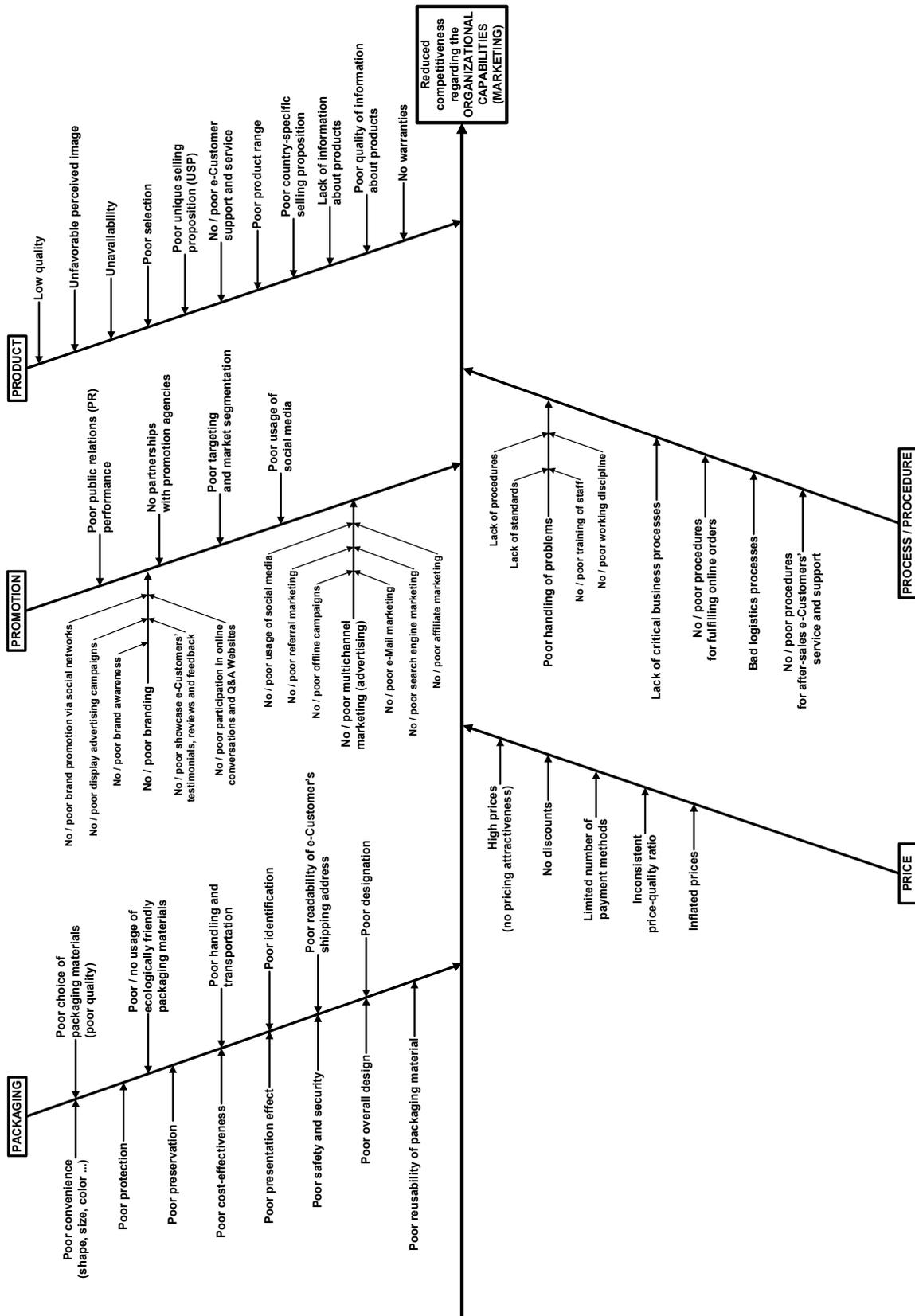


Figure 8. Cause-and-effect diagram depicting the marketing-related factors that reduce competitiveness vis-à-vis organizational capabilities in e-Commerce (authors' representation)

Conclusion

Electronic commerce has greatly redefined business and customer relationships, business processes, and has even restructured the whole trading industry by providing new distribution channels, novel delivery and payment methods, as well as a new communication medium. Though, as the e-Commerce paradigm becomes a mainstream, claims have often been made that the mere online presence does not represent a decisive competitive advantage. This finding has triggered a myriad of research endeavors striving to identify and classify factors affecting the competitiveness of e-Commerce firms.

In this paper, we put the focus on the causality of factors reducing firm-level competitiveness in e-Commerce. The analysis underpins six major e-Commerce areas, including (1) Hardware architecture, (2) Software, (3) Telecommunications, (4) Website design, (5) Human resources, and (6) Organizational capabilities.

The resulting Ishikawa diagrams were constructed during multiple brainstorming sessions that have helped not only to identify potential causes of a problem (i.e. reduced competitiveness in different e-Commerce areas) but also have helped to 'see' relationships among them. The brainstorming technique frequently gets a bad reputation among practitioners since some people have had bad experiences applying it too loose, and consequently they did not yield a result in any useful information or ideas. Despite this, we found it a very useful tool, but only if it is carried out in a rather well-defined and structured way since only then it can reveal significant potential causes that would not be immediately obvious.

Throughout the analysis, more than 620 potential root causes, organized into three hierarchical levels, have been identified as possible factors that can significantly reduce the competitiveness of e-Commerce firms. Out of these, more than 250 belong to the first level, more than 260 belong to the second level, and more than 100 belong to the third level. This finding confirms the extraordinary complexity of the concept of competitiveness, not only regarding e-Commerce firms but in general, too. In this context, it is worthy to mention that using Ishikawa diagrams proves to be particularly helpful in the following cases: (1) When analyzing and finding the root cause of a complicated problem, (2) When there

are many possible causes for a problem, (3) When the traditional way approaching the problem (trial and error, trying all possible causes, and so on) is very time consuming, and (4) When the problem is very complicated and the root cause cannot be identified easily.

Despite the fact that during the analysis numerous causes have been identified, the list is far from being concluded. A deeper analysis can easily reveal the existence of factors hidden beyond the second hierarchical level within Ishikawa diagrams. Hence, what we have proposed here can be considered as being just the tip of the iceberg.

The proposed framework of cause-and-effect diagrams provides a solid base of evidence that might support academics conducting case studies, practitioners, and managers to convey comparative overviews and further research on this and similar topics.

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