Managing Global IT Delivery Networks: A Literature Review from the Supplier’s Perspective

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Abstract

Information technology (IT) is one of the major drivers of globalization. Thus, the delivery of IT services itself benefits from globalization due to the distribution of labor-intensive services and tasks to locations with lower labor costs, known as offshoring. From the client’s perspective, there is also a demand for globally standardized IT services being delivered around the globe, considering local differences such as language. The concept of the global delivery model (GDM) combines the benefits of on- and offshoring, such as flexibility and cost reduction, but it also increases the complexity of the coordination. A global delivery network (GDN) is the nexus of interconnected processes, skills, resources, systems and structures on a high maturity level to ensure the seamless and efficient delivery of services across multiple locations. The literature review aims to present definitions and provide an overview of the current body of knowledge of GDNs and to identify potential for further research.

1. Introduction

Information technology (IT) is one of the major drivers of globalization. The best-selling book “The World Is Flat” [23] described that globalization of the 21st century enabled a worldwide connection through computers, the internet and modern communication tools. Although IT has made globalization possible, other aspects such as the liberalization of markets, the growing importance of costs, and economies of scale, have led to the emergence of global customers and increasing competition for IT service providers [24].

Originally, IT providers began by distributing labor-intensive parts of their service delivery to locations with lower labor costs in order to reduce their total delivery costs. These locations are mainly located far from the headquarters and are commonly known as offshore locations [26]. The so-called offshoring phenomena, can be seen as part of the third industrial revolution, the "information age", and like other industrial revolutions “it will require vast and unsettling adjustments” [5]. A study from the Organisation for Economic Co-operation and Development (OECD) in 2008 revealed that revenues generated by offshore services doubled between 2005 and 2008 [54]. Today, offshoring is not only motivated by cost reasons; other factors like access to qualified staff or proximity to customers are relevant reasons to build up offshore resources [8]. From a customer’s perspective, there is also a demand for global IT services being delivered around the globe, considering local differences such as language [38]. According to Gartner’s IT Services Sourcing survey in 2010, the global delivery capabilities of an external IT service provider is the second most influential criteria in an organization’s evaluation and selection process [47].

The research study “Global Sourcing, Supply & Support for Practice” proposed three internationalization strategies for IT providers [65]: (1) Global Sourcing, (2) Global Support, and (3) Global Supply. These three strategies are motivated by different goals and lead in different ways to setup global delivery networks (GDNs). While Global Sourcing focuses on cost reduction through the establishment of foreign capacities (mainly by the creation of offshore capacities), the motivation of Global Support is to fulfill the customer’s demand for local support at their foreign subsidiaries. Global Supply addresses the market entry of IT service providers in emerging countries. Furthermore, several companies experienced outsourcing failures with pure offshoring models [77]. In some cases this led companies to shift outsourcing projects back to the home country or a country with more cultural proximity. Hence, service providers need to offer alternative delivery models than pure offshore delivery. Buxmann et al. [7] introduced the term “global delivery model” (GDM) as the second generation of offshoring. In comparison to offshoring, there is no concentration on one offshoring target country, as the GDM is allocated to several countries. The concept of the GDM combines
the benefits of on- and offshoring, such as flexibility and cost reduction, but it also increases the complexity of the coordination of the GDN [6]. GDNs occupy the right locations with an adequate skill set and balanced service activities to apply services cost-effectively and mitigate risks [52]. To better understand and define the phenomena of GDNs, as well as identify gaps in the research, the following research questions are addressed:

1. What are the relevant definitions in the field of GDNs?
2. What are the research foci for GDNs within the Information Systems (IS) literature?
3. What are potential areas for future research?

To answer these questions, a literature review was initiated. The following sections describe the research method used and the different phases of the literature review.

2. Research Methodology

Several articles outline the importance of a literature review as well as their wide acceptance [4, 12, 21, 73, 75]. “The reviewing of existing literature relating to a topic is an essential first step and foundation when undertaking a research project”[4]. A literature review aims to identify the sources and content related to a topic and to evaluate the relevance and rigor of the research [73]. Relevance is proven by ensuring that aspects of the research already known are not investigated twice [4]. Rigor is evaluated through the effective use of the existing body of knowledge [30].

Vom Brocke et al. [73] highlight the importance of rigor in documenting the review process. Therefore, they recommend a review framework consisting of five steps where knowledge continuously grows during the review. The five steps are the (1) definition of review scope, (2) conceptualization of the topic, (3) literature search, (4) literature analysis and synthesis, and (5) research agenda [73]. These five steps will structure the following sections of this article. Within this section steps (1) – (3) are described, while steps (4) and (5) are presented in chapters 3 and 4.

2.1 Definition of Review Scope

The aim of defining the review scope is not to provide immediate answers to the questions of the literature review. It is, in fact, a necessary first step to clarify in any literature review to form implications for the later research process. In order to define the review scope, vom Brocke et al. [73] recommended the use of the taxonomy for literature reviews presented by Cooper [12]. This taxonomy consists of six constitutive characteristics, as shown in Figure 1. Each characteristic contains categories, some of which are mutually exclusive (4 and 6), whereas others can be combined (1, 2, 3 and 5) [73]. For this literature review, the categories are defined in shades of grey.

The focus of the review is to identify research outcomes and central issues being historical and conceptual. The point of view is neutral. Furthermore, the aim of the literature review is to provide specialized and general scholars as well as practitioners the status quo on the topic of global IT delivery networks. Although the aim is to be as exhaustive as possible, the journal search focused on IS literature. Hence, coverage of the review is representative.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus</td>
<td>Research Outcomes, Research methods, Theories, Applications</td>
</tr>
<tr>
<td>Goal</td>
<td>Integration, Criticism, Central Issues</td>
</tr>
<tr>
<td>Organization</td>
<td>Historical, Conceptual, Methodological</td>
</tr>
<tr>
<td>Perspective</td>
<td>Neutral Representation, Expousal of Position</td>
</tr>
<tr>
<td>Audience</td>
<td>Specialized Scholar, General Scholar, Practitioners, General Public</td>
</tr>
<tr>
<td>Coverage</td>
<td>Exhaustive, Exhaustive &amp; Selective, Representative, Central Pivotal</td>
</tr>
</tbody>
</table>

Figure 1. Literature review of taxonomy according to Cooper [12]

2.2 Conceptualization of the Topic

Conceptualization of the topic is conducted with the target to draw “a broad conception of what is known as the topic and potential areas where knowledge may be needed” [69]. Furthermore, Baker [4] suggested conducting a search for relevant key issues of a subject in sources such as seminal textbooks, encyclopedias, or handbooks. However, as the field of global IT delivery networks is relatively new, little information is available from these sources. The following definitions of the term GDN are two examples of definitions found by conducting an initial keyword-based database search:

“Global delivery is the ability of an organization's service provider (internal or external) to source skills from several global locations. This disparate set of resources must come together seamlessly, with high process maturity, and must operate in a secure and scalable global infrastructure supported by significant investments to mitigate or manage risk [34].”

“These global locations may be geographically dispersed to include an appropriate mix of on-site,
onshore, nearshore, and offshore resources. Thus, rather than focusing on the choice of three location options — offshore, onshore, or nearshore — comprehensive GDMs of offshoring allow companies to tap into the skills, expertise, and infrastructure of locations beyond one single locale [2].”

One of the most discussed IS topics in this context within recent years has been services offshoring [37]. The definitions above also show that offshoring plays an important role within the conceptualization of the term GDN. Buxmann et al. even describe global delivery the second generation of offshoring [7]. Hence, it is important to understand the term offshoring in order to review the literature. Furthermore, offshoring includes many challenges that a GDN faces, and the differentiation between the offshoring and global delivery phenomena do not seem to be clear in the literature. Offshoring in a narrower sense can be defined as the following: “Offshoring can be defined as the relocation of business processes (including production, distribution, and business services, as well as core activities like research and development) to lower-cost locations outside national borders. This term assumes the perspective of the country of origin” [19].

In a broader sense, offshoring seems to be used as a synonym for global delivery [62]. Thus, the literature search within the top IS journals was extended to all relevant offshoring literature. On the other hand, offshore outsourcing literature from the demand perspective was excluded, as several literature reviews have already been conducted in this field [15, 16, 40-42, 51]. Nonetheless, the perspective was not only limited to external service providers. Internal service providers and IT departments facing global delivery were also included. While the organizational and management structure is intended when referring to the GDN, the GDM describes the delivery approach. As this differentiation is not always clear in the literature, both terms are used as synonyms within the search.

### 2.3 Literature Search

In order to access a vast amount of available knowledge, we started the literature search process with a keyword search within databases. Additionally, we included further articles advised by senior scholars and experienced practitioners. In a further step we broadened the content but narrowed the source of the search, with a depth analysis within the top-ranked IS journals. These top peer-reviewed journal articles can be considered validated knowledge and are likely to have the highest impact on their research field [58].

For the database searches we used the following keywords: (1) “Global Delivery Network”, (2) “Global Delivery Model”, (3) “Global Delivery”, (4) “Information Technology” (5) “Information Technologies” (6) “Information Systems”, (7) “Offshoring”, (8) “Offshore”, (9) “Literature”, (10) “Review”, (11) “Synthesis”, (12) “State-of-the-Art”. While the keywords (1) and (2) were searched as one keyword, the other keywords were combined as follows: (3) AND ((4) OR (5) OR (6)); (7) OR (8) AND ((9) AND ((10) OR (11) OR (12))). Keywords (1) and (2) were searched in full text and the other searches were conducted in title, abstract, subject and keywords. These restrictions allowed us to concentrate on the most relevant articles as we were searching in a multitude of research domains. We excluded the acronyms “IT” and “IS”, as many search engines interpret “IT” as “it” and “IS” as “is”.

The database search contained two database hosts: EBSCOhost and ProQuest. We restricted the search to scholarly articles. Within EBSCOhost we excluded some databases which are far-off topic, like medical databases, but we did not exclude for example sociological databases even though there is no direct link to the topic. The database search was conducted in the time period between November 2011 and March 2012 with 18 different configurations. From the database research we extracted 31 results to be further evaluated by filtering the articles pertaining to the research questions and cleansing from duplicates. For the journal search we chose five journals from the AIS senior scholars’ basket of six which consists of all major journals in the IS field. Furthermore, we added three A-and B- ranked IS journals according to the journal ranking “VHB JOURQUAL 2” in order to obtain all relevant articles. This leaves us with the following eight topic relevant journals: Information Systems Research (ISR), Management Information Systems Quarterly (MISQ), Journal of Management Information Systems (JMIS), Information Systems Journal (ISJ), Journal of the Association for Information Systems (JAIS); Journal of Strategic Information Systems (JSIS); Journal of Information Technology (JIT) and Wirtschaftsinformatik (WI).

As we were aiming to broaden the search spectrum at this stage of the search, we performed an in-depth-analysis of each journal between 2000 and 2011 by title and abstract reading to select all relevant articles pertaining to the research questions and the defined review scope. Without counting the duplicates, we found 28 additional articles to be reviewed.

Webster and Watson [75] also point out that even a rigorous keyword analysis is no guarantee that all
important articles have been included. Therefore they propose asking senior scholars to advise on further literature. Thus, eight articles were added to the basket of literature. For completeness, we would like to remark that there were two further articles not available during the time of research. In total we analyzed 67 articles.

3. Literature Analysis and Synthesis

Before starting the analysis and synthesis, it is important to show the evolution path towards GDNs as a comparative new delivery approach. According to Erber and Sayed-Ahmed [19], the outsourcing concept was first applied by Ross Perot and his foundation of Electronic Data Systems (EDS) in 1962. Perot pointed out that while other companies are familiar with designing, manufacturing and selling furniture, his company is familiar with managing information technology. Due to the globalization and technology improvements, companies’ internal IT organizations and IT service providers have started to offshore their IT service delivery. One of the first mega-deals was an outsourcing contract of $3.2 billion between Xerox and EDS in 1994. This deal can be seen as the initiation of IT offshoring, even though other offshoring activities previously occurred. Initially, the offshore locations act as an extended workbench for the local delivery units. Due to the industrialization of IT services and their infrastructure, these delivery models were not applicable to leverage the potential of, for example, standardization and automation [55]. Around 2007, the GDM arose as a new delivery approach. Global delivery contains optimized delivery structures and the ability to deliver seamless services involving the skills and resources from different global locations. Therefore, the geographic dispersion of locations is not the only focus of the approach, but rather the comprehensive delivery with the right skills, expertise and infrastructure beyond one single location [2]. The joint impact of industrialization and globalization has shifted global IT delivery from focusing on low-cost locations to “global delivery networks supporting globally delivered industrialized solutions and services”. Therefore, IT service providers (internal and external) should invest in strong methodologies, tools and processes across several locales in order to benefit from local knowledge, language, culture, time and risk mitigation [70].

Table 1 summarizes the results of the literature analysis and synthesis. We developed concept matrices [75], comprising two different types of characteristics: (1) demographic characteristics and (2) content-related characteristics. The characteristics “time span”, “research method”, “applied services”, “delivery perspective” and “network type” are exclusive.

Looking at the demographic characteristics, the time span analysis shows that the research on GDNs is comparatively new. Only one article was written before 2000, and the majority of articles were written after 2005 (N=53). Considering 2007 as the rise of GDN, it is demonstrative that 39 articles were written after 2007. The fact that American companies started with IT service offshoring [31] seems to be reflected in the regional origin of the authors, while companies from Europe, mainly represented in the region of Europe, the Middle East and Africa (EMEA), followed. It is interesting that within the region of Asia Pacific (APAC), from a total of 15 articles, ten are written by Indian researchers and experienced practitioners. That might reflect the fact that India is the leading offshore destination [9]. Case study research was the predominant method within the relevant literature (N=33). This indicates that the research is “in its nascent phase” [37] and, thus, mainly quantitative and/ or exploratory.

In their definition of GDNs, Karamouzis et al. [34] differentiate offshoring by stating that GDNs focus on skills, processes, tools, methodologies, overall structure and strategies for seamless delivery. Hence, this definition was used to structure the research foci. By summarizing and adding some aspects as a result of the literature analysis, the research foci shown in Table 1 were applied. In the following, we give an overview of topics within the research foci as well as examples.

The characteristics of the research focus “strategy” can have different facets; from internalization strategies to the success factors of GDNs. Gupta and Govindarajan [29] evaluated how to convert a global presence into a competitive advantage. Stiehler and Fricke [65] identified different internationalization strategies of IT service providers based on ten case studies. Another aspect covers strategies of different service provider types, and how they differ in the establishment of their GDN [39, 67].

Research focusing on “organization and management” mainly deals with the establishing principles of offshore centers [10], the impact of the choice of delivery approaches on organizational structures [14, 25, 43] and the success factors that determine the implementation of GDNs. For example, Oecking and Westerhoff [55] describe how
### Table 1. Concept matrix with demographic and content-related characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Categories (Number of articles)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographic Characteristics</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Region</strong></td>
<td>Americas (43)</td>
</tr>
<tr>
<td><strong>Research method</strong></td>
<td>Case study (33)</td>
</tr>
<tr>
<td><strong>Content-related Characteristics</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Research focus</strong></td>
<td>Strategy (9)</td>
</tr>
<tr>
<td><strong>Organization level</strong></td>
<td>Firm level (27)*</td>
</tr>
<tr>
<td><strong>Applied services</strong></td>
<td>Infra. services &amp; AM (1)</td>
</tr>
<tr>
<td><strong>Delivery perspective</strong></td>
<td>Vendor-client-relationship (20)</td>
</tr>
<tr>
<td><strong>Network type</strong></td>
<td>Internal (47)*</td>
</tr>
</tbody>
</table>

1 Characteristics not mutually exclusive.

Siemens IT Solutions and Services implemented their GDN. Mastakar and Bowonder [48] defined the Infosys’ GDN as “a framework for distributed project and multi-location engagement teams using appropriate technology platforms that can easily scaled”. Thus, the GDN is part of the organizational process.

Looking at the research concentrating on processes, most of the research focuses on distributed work and teams. Some of the research examines the disaggregation of services occupation [50]. Further research evaluates aspects of the teamwork itself, such as the knowledge transfer process [57] or the phenomenon of the “24-Hour Knowledge Factory”, a global working model on a sequential base, from different perspectives [8, 28]. However, other studies have explored the software development process [63, 79] and the usage of methodology of agile software development within the context of global delivery [60, 71]. Dibbern et al. [17] discussed types of additional costs that may arise in distributed projects, whereas others examined quality aspects in globally distributed processes [1, 6, 59], as well as the impact of distributed processes on performance [11].

“The IT labor market is rapidly becoming a truly global market” [22]. Therefore, challenges of different global staffing systems are analyzed [61]. Like the research on processes, the research on people and skills focuses mainly on the distribution of teams. Research in this area analyses various facets of skill development such as global talent programs [66], or capabilities development [31]. Sarkar and Sarker [62] explored the agility in distributed development teams by examining three dimensions of agility. Levina and Vaast [45] discovered that achieving effective collaboration mainly depends on middle managers overcoming boundaries. Kayworth and Leidner [35] also explored the leadership effectiveness in global virtual teams, while Levina and Xin [44] compared IT workers across countries. In the field of knowledge transfer, research ranges from the evaluation of the role of
transactive memory within globally distributed teams [57], and conflicts in knowledge transfer due to misunderstandings [72] to models of client-vendor knowledge transfer [76].

Cultural barriers are seen as the key challenge within the offshoring literature [3]. Cultural aspects of global delivery are also mainly discussed against the background of globally distributed teams. Cultural research evaluates cultural conflicts in distributed teams [20, 33, 74], psychological aspects like anxiety and psychological security [36], and the creation of socialization [56]. To overcome cultural and cognitive distance in offshoring, Mahnke et al. [46] introduced the role of offshore middlemen. Other articles deal with the influence of temporal and spatial boundaries [13, 53]. As the body of knowledge has developed significantly over the last years, researchers have started to explore special aspects of this topic in-depth.

The geographical perspective mainly discusses the role of India in various aspects and in comparison with other countries, as well as from the perspective of the countries relocating services to India, as India is the most important offshore location for IT service delivery [9, 18, 64]. Further research develops frameworks for country attractiveness [32, 38]. Using the term “geographic” in a more open sense, aspects other than merely location and country were investigated. Tigre et al. [68] indicate the phenomenon of “knowledge cities”: “as in several regions, the software industry is organized in clusters.”

Even though technology is one of the major drivers for global delivery and is mentioned in most of the articles, only two articles evaluated the use of technology within globally distributed networks [28, 78].

Most of the research focuses on the team and individual level of the organization (N=37), as most of the articles focus on topics within distributed teams. As IT offshoring started with software development [9], it is not surprising that application development and software development (AD & SD) is generally the most discussed service after IT services, not specifying the service exactly, but rather dealing with the overall outsourcing phenomenon. Only one article was found that focused on infrastructure services and application management (Infra. Services & AM), and five on business process outsourcing (BPO), even though these services are generally included in IT services in general. Furthermore, the perspective of external providers (N=22) and aspects of the client-vendor-relationship (N=20) are discussed the most, as the optimization of the GDN becomes more important. The more customers are in scope. The internal network type, meaning within the boundaries of one company, is the most discussed network type, as most of the articles focus on the delivery within one company. External networks are mainly discussed according to vendor-client relationships.

The goals to be achieved by GDNs in addition to cost reduction, the optimization of GDN and parts of the network targets delivery efficiency, quality increase, transfer of knowledge, skill optimization, customer satisfaction as well as optimization of vendor-client relationships are discussed.

Looking at the body of knowledge as a whole in order to aggregate the results, we were able to identify three different levels of GDNs: (1) the strategic level discussing motivation and internationalization strategies (e.g. [29], [65]), (2) the organizational level addressing decision making support for organizational structures or delivery center principles (e.g. [55], [10]), and (3) the process level dealing with aspects such as the improvement of working together across spatial, temporal and cultural boundaries or staffing topics (e.g. [3], [53], [31]). Even though there were no articles introducing a comprehensive view along all levels, the literature review as a collective body of knowledge enables researchers and practitioners to understand the GDN as a whole.

4. Research Agenda

Most of the analyzed research focuses on processes, people and skills, as well as culture, which are mainly driven by the challenges occurring due to distributed work. The geographical aspect is also an established field. Furthermore, the research concentrates on the team and individual level. Hence, on the process level more detailed and specialized research is demanded. Examples are aspects as the concrete development of performance indices for virtual teams [11].

Of the research focusing on the firm level (N=27), ten articles discuss geographical topics. The rest of the research discussing strategic, organizational and management aspects, is mainly limited to challenges, success factors and implementation strategies. However, having a GDN is no longer a competitive advantage. The next level is to have an optimized GDN [46]. Thus, on the strategic as well as on the organizational level we identified a gap in fundamental concepts for configuration and governance structures of GDNs. “As the offshoring industry matures from a single-location offshoring service to a global service delivery model involving multiple locations, challenges to smooth
collaborative relationships become more exacerbated and complex” [45]. Mazzawi et al. [49] described that the success factors of global delivery lie in operational excellence, including sensible governance. Oeccking and Westerhoff [55] also illustrate the importance of clear governance for a GDN to manage the complexity. Looking at the overall IS literature, research focusing on the service provider perspective is relatively scarce [27], and even in the reviewed articles considering the external provider perspective cope with pure software development. But the entire GDN of end-to-end service providers is rather more complex. Furthermore, a comprehensive view connecting the strategic, organizational and process levels is missing in today’s body of knowledge.

For our research agenda we identified a need for research assigned to the categories flagged by “*” in Table 1, focusing on governance within the research focus “organization and management”. Our further research aims to identify IT service providers’ applied governance mechanism for GDNs in order to determine the relevant decision makers and decision domains. Knowing the applied decision process within today’s GDNs, common governance frameworks from IS, International Management as well as organizational and network theories can be adopted to develop a governance framework to the specifics of GDNs from a service provider perspective. Therefore, case study research will be carried out on the one hand, and further literature reviews within related research areas on the other, in order to transfer existing frameworks to the specifics of GDNs.

5. Conclusion

This paper aims to identify relevant definitions for global IT delivery networks from the supplier perspective and provide an overview of the body of knowledge in research on GDNs. Based on the literature analysis and synthesis, the goal is to uncover research gaps in order to derive a research agenda.

Even though some definitions in the literature differentiate GDNs from offshore models [2, 34], there is no clear overall understanding to distinguish the borders between the two phenomena. Summarizing the discovered definitions, a GDN is the nexus of interconnected processes, skills, resources, systems and structures on a high maturity level to ensure the seamless and efficient delivery of services across multiple locations. Offshoring in the narrower sense can be seen as the shifting of service delivery or tasks to locations with lower labor costs, and as a point-to-point relationship to the service determining the delivery unit. Nevertheless, various aspects of offshoring, even in the narrower sense, also have an impact on the factors of GDNs. Therefore, offshoring was included from the supplier perspective to the literature review in order to provide an overview of the research within the field of global delivery. Offshoring arises due to technological improvements and globalization. The phenomena of the GDN developed as a new delivery approach, transitioning from a focus on labor arbitrage due to geographic dispersion and offshore as an extended workbench to the composition of the right skills, expertise and infrastructure from a multi-location perspective [2]. In order to categorize the research within GDNs, seven research foci were identified: strategy, organization and management, processes, people and skills, culture, geographic and technology. Most of the research concentrates on the processes, people and skills, culture and geography. Distributed work and teams is the most discussed topic within all research foci, as the disaggregation of services comprises several challenges at all levels of global delivery. This is due to the fact that IT service delivery is mainly driven by human occupation and interaction. The research on strategy, organization and management primarily discusses internationalization strategies, challenges, success factors and implementation strategies. Several authors [43, 45, 55] underline the need for clear organization and governance structures to cope with the complex system of a GDN.

6. References


