

# Networks and Firm's Scalability: How Network Factors Contribute in defining Born-Global Scalability Path

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## **ABSTRACT**

*This paper investigates the underlying factors that link firm's network and scalability. Specifically, it examines firms that expand geographically early in their life cycle also known as Born Global (BG) or International New Venture (INV). Several researches studied BG firms' scalability process following the Network approach. Extant management literature has not yet succeeded in defining the underlying factors that link BG firms' network to the scalability process. Scholars are seeking to define a conceptual framework that comprehensively describes how network factors interplay at organizational level to achieve scalability. This paper proposes a model that reconnects Network attributes to the firm's dynamic evolution process, that starts from the entrepreneurial stage of inception and shapes up in the organizational structure of a BG firm. The model highlights three different Network constructs emerge during the firm expansion: firstly, the entrepreneurial social network that drives the initial inception of the firm; secondly, the organizational connectedness of a BG firm, capable of generating learning paths to enhance operations governed by scale-free network distribution; and finally, the degree of accessibility to a physical global network that allows BG firms to unleash their potential at a global scale. The theoretical investigation is supported by evidence from BG case studies, and followed by a qualitative empirical application of the presented dynamic model on a pilot sample of three BG firms.*

**Keywords:** International Entrepreneurship, Network Science, Born-Global firms, Scalability, Organizational Connectedness, Network perspective, Scale-free Network distribution

## **INTRODUCTION**

*The counterfactual paradox of connectivity and scalability*

A recent debate on globalization put at center stage the statement "the world is flat". A metaphor used by the journalist Tom L. Friedman (2005) on how globalization forces are levelling the playing field in creating and spreading equal opportunities in terms of commerce. This viewpoint has been promptly rebounded by the scholar Pankaj Ghemawat. In opposition to Friedman's statement supporting global connectivity, Ghemawat (2009) argues that the degree of globalization is in a declining trend. Drawing on empirical data elaborated by DHL, a logistic courier, he demonstrates the measurable degree in the breadth and width of connectedness taking place among countries, companies and individuals (Appendix I). His findings underline how business agents encounter several practical frictions along with the globalization process. Furthermore, the findings emphasize how few are the cases where highly connected agents take advantage of the *wired* arena. (Ghemawat 2009 p. 3) "Despite talk of a new, wired world where information, ideas, money, and people can move around the planet faster than ever before, just a fraction of what we consider globalization actually exists. The levels of internationalization associated with cross-border migration, telephone calls, management research and education, private charitable giving, patenting, stock investment, and trade, as a fraction of gross domestic product (GDP), all

stand much closer to 10 percent than 100 percent.”

In line with this debate, and referring to both sides, cases of BG firms that benefit from high connectedness to reach scalability will be investigated. At the same time the research aims to highlight what factors intervene in defining the idiosyncratic paths of BG firms global scalability.

Assuming Friedman’s hypothesis that every agent is increasingly connected to the whole world, then the geographical presence (number of subsidiaries) becomes less relevant to reach a global scale distribution. Hence, also a start-up, independently from its location, can aim to scale globally. Conversely, Ghemawat posits his counterfactual critic to the *perfect connectivity* axiom, stating that actual business operations still find significant constraints via local restrictions and frictions. Therefore, becomes necessary to better understand, from one hand, the critical factors that allow a greater level of the firm’s connectedness, and from the other hand, the constraints that delay or limit the firm’s potential growth.

The first assumption of this research regards the foundational stage of a BG firm. That is usually characterized by the global vision of the founding entrepreneur and her capability to turn personal network (resources and knowhow) into an organizational asset.

In the second assumption, referring to Network Science theory, we assume that a firm can aim to become a BG venture if it acquires, since its early stage, access to operations governed by scale-free network (power law distributions). Network theory define scale-free property or *power law* (i.e. scaling law) as distributions where few nodes (elements) cluster at the top taking up to 95% of the frequency of all population (Barabasi 2016). Hence, if we consider network degree of distribution in terms of users’ preferences, scale-free attribute may appear very relevant. In fact, operations governed by a power law distribution allow firms to identify a restricted range of demand to be sold at global scale. Therefore, power law distributions potentially highlight operations where 80% of the sales point to few items offered. This attribute can be gained in various forms: building a scale-free network distribution anew, or accessing and expanding an existing one via internal processing of data and flow of information. To spot power law distributions a firm requires to establish an internal organization perspective twined with the ability to single out operations that may serve a scale-free network distribution from the demand side.

The third assumption relates to the key attribute of global physical Networks: scalability requires the firm to gain accessibility to an industry-relevant global network. In this case, the considered physical network is intended in terms of human resources, suppliers and distributional channels.

The fourth assumption concerns BG speed-of-growth describing the firm benefit after it acquires a central position within the industry. Firms that become hubs take advantage from the preferential attachment property of ‘high degree nodes’ (Barabasi 2016).

Overall, acknowledged certain characteristics that distinguish scalable networks from not scalable ones, we discuss organizational distinctive factors that lead to exponential international growth, in line with a comprehensive strategic view. In particular, although some network factors/ attributes/ characteristics create ground conditions for exponential expansion, others operate in opposite direction raising constraints that hamper network scalability. The research aims to draw a more sophisticated conclusion about the matter of new ventures entering the arena of international business strategy. The analysis rejects “the business world [as] flat” (Friedman 2005), and as “dis-connected” (Ghemawat 2009 p.4), while recognizes the role of key forces at play in presence of scale-free networks operations and small world entrepreneur’s clusters (Zaidi 2012). Rephrasing the concept in another terminology, scalable network conditions such as the *flat-world effect* applies to a very restricted arena of agents, while leaving the rest bounded to wide regional flows of trade (Lopez et al. 2009). BG enterprises can represent a special sample of the first group.

## LITERATURE REVIEW

Beginning in the early '90s, a large volume of works has formed a rich literature base upon which recent theoretical and empirical contributions are drawing on to explore the phenomenon of BG firms (Cavusgil, Knight 1996) and International New Ventures (INV) (Oviatt and McDougall 1994). Limiting the present analysis to works that embraced Network theoretical perspective to analyze the BG phenomenon, Table 1 tries to systematize the works that have determined a fertile ground of analysis in the extant literature. Two main strands have been dominating Network perspective from theoretical standpoint: the Resource Based-View (RBV), which considers the Network as a dynamic path of innovation, growth and knowledge; and the Network approach per sé, considering idiosyncratic network structures in relation to the Transaction-Cost Theory.

Starting from the RBV, early works on BG have focused the attention on the factors that drive superior international performance leveraging internal knowledge routines and organizational capabilities; in particular Network capacity has been explored in catalyzing and funneling skills and stimulating firm-specific flows of information (Knight & Cavusgil 2004). These contributions have nurtured a strand of academic efforts (Teece and Pisano 1994) encompassing the role of dynamic, path-dependent models that allow multiple use/combination/control of organization-resources. As pointed out by Barney (1991 p.114) "information processing system is deeply embedded in a firm's informal and formal management decision making process". Within this course of research, Coviello (2006) has shown evidence of the importance of Networks' structures in influencing rapid internationalization policies, pointing at factual observations of Network peculiarities (range, centrality and size of the network). Rialp et al. (2005) have shed light upon the role of intangible resources, technology, geographical interconnectedness and interconnectivity among agents, as firm-specific capabilities that undergirds international growth. Teece et al. (1994 p. 541) have emphasized these attributes referring to the firm's 'strategic posture' as concerning the "current endowment of technology and intellectual property, as well as its customer base and upstream relations with suppliers and strategic alliance". Focusing on the market dynamics, Knight (2015) recognizes that as the globalization of markets has been fostering a new type of competition (i.e. rise of Global Value Chains and technological developments), the BG phenomenon has to be reconnected to a mix of factors depending on internal organizational attributes of BG firms: "collection of capabilities at the strategy and organizational-culture level" (Knight et al 2004 p. 137). Yet, in this stream of contributions the 'Gradualist view', also known as *stages model of internationalization* (or *Uppsala model*; Vahlne and Johanson 1977), presents distinct approach regarding firm resource accessibility in foreign-market-entry-modes (Madsen and Servais 1997). Although this research began its contribution far from the Network view, a recent revision by Uppsala model authors (Vahlne and Johanson 2009) has acknowledged the increasing importance of Networks and proposed a network-shift in the rationale behind their construct. The later proposed model has explicitly recalled the importance of Network in the practices of building knowledge, trust and commitment in foreigner market. Labelled as 'relation-specific knowledge', this capability, acquired via network, has been engendering value chain dynamics of learning, exploration and exploitation unleashed via expanding activities.

A parallel strand of BG studies, acquiring a growing attention, is employing Network constructs as substantial conceptual framework per sé. In spite of the wide variety of the investigation focus they apparently present, they all draw on strategic models rooted in Transaction-Cost Theory (Williamson, 1981). Some works have elaborated upon inter-firm exchanges, examining the relationship among firms as structural configurations; Granovetter (1985) concept of *weak ties* has been enriched with complementary findings about the

presence of *strong ties links* in networks of alliances (Blomstermo, Sharma 2003; Capaldo 2007). Aiming to determine theoretical framework for BG firms, Blomstermo et al. (2003) have demonstrated how experiential knowledge accumulates over time constituting a path-dependent constraint where commitments and opportunities are encountered via inter-firms ties. It is in this sense that weak ties vs strong ties, can better position firms in acquiring a distinct new knowledge. Other scholars (Gulati et al. 2002), exploring the institutional side of the organisational structures of inter-firm Network (Madsen, Servais 1997; Powell 1990) have tested the importance of the numerous network factors active in forming firm-specific organizational network: e.g. centrality, partners-profile and ties-type (weak, cohesive, bridging, strong). Other authors (Blankenburg et al. 1999) have examined the undergoing interplay among the agents in BG network of relationships, shedding the light on the level of mutual commitment generated via interfirm ties.

Despite important advancement in the BG body of literature, the models and attention reserved to Network forms have not yet fully defined a model capable to explain the ‘Network formation process’ and the dynamic use of related resources. Particularly, less efforts have been dedicated to analyzing the scalability process in the light of network organizational factors. This field remain a relevant gap to fill and reconnect with the explanatory lines of BG’s pattern of growth.

Summing up, the present research seeks to participate in the extant literature on BG phenomenon, clarifying key theoretical aspects that lie in the Network perspective. Few works have explored and illustrated the *structure of the network* in relation to the internationalization process of expansion. This paper aims at investigating over BG firms vs Network following the evolutionary line that departs from the entrepreneur network capabilities and matures into organizational firm-specific key asset. Through a qualitative exploratory research, the article starts from the theoretical side of the BG field proposing later a model that clarifies the dynamic process of a BG firm in acquiring and deploying degrees of internal Connectivity and external control over the physical Network together with centrality and speed of growth.

**Table 1. Selected Studies on Network of Born Global firm**

Approach	Authors/Year	Study description	Findings on network relationship
Resource Based View	Knight Cavusgil 2004; Knight 2015	Innovation, organizational capabilities and the born global firm	Knowledge is used to refer to the capacity to apprehend and use relationships among informational factors to achieve intended ends.
	Rialp and Rialp 2005	Review of 38 firms that deal with international new ventures, global start-ups and born-global firms. Search for theory-building approaches that would provide the basis for developing conceptual models and constructs.	The paper highlights the role of intangible-resource base in the context of firm-specific international capability and the external environmental factors that firm face on ordinary routines (technology, geographic setting, home market value chain interconnectedness...)

	Coviello 2006	Review of RBV theory and a discussion of its relationship with networks and the INV firms	The study presents three propositions on network development. Range, centrality and size of the network increase while density decreases. Other propositions suggest that INV's reputation and economic ties dominate, while other propositions relate to network as path-dependent, unstable and idiosyncratic.
<b>RBV (Uppsala model)</b>	Vahlne and Johanson 1977; 2009	(1977) Uppsala Model of internationalization is seen in relation to the level of knowledge that the firm possess of cultural business environments. (2009) Authors consider growth as a multilateral network development process; the firm's environment is made up of networks, and this has implications for the firm learning processes	(2009) Two concept are analyzed: network position and firm-relationship commitment decisions. Relationship has been added to point out the commitment role of relationships or "networks of relationships". This variable implies that the focal firm decides either to increase or decrease the level of commitment to one or several relationships in its network.
<b>Network view</b>	Madsen and Servais 1997	Internationalization of Born Globals exploiting the attributes firms possess within Networks	Internationalization can occur in three ways: (1) through the establishment of relationships in country networks that are new to the firm, (2) through the development of relationships in those networks which are known to the firm, and (3) through connecting/integrating networks in different countries by using the existing relationships of the firm as bridges to other networks.
	Gulati, Dialdin, Wang 2002	Organizational Network structures	The paper describes egocentric organizational network ("focal ego" organization and "alter" firms ties) drawing attention on the Centrality, Type of Ties and Partner profile.
	Sharma and Blomstermo 2003	Inquiry conducted on BGs knowledge-flows before their first entry to international market context. Path depending growth.	Relationships supply knowledge, with related risks and business opportunities. Particularly "weak ties" are important in the beginning of internationalization.
	Blankenburg Holm et al. 1999	A structural model of business relationship in network context is formulated and tested on data from the European International Marketing and Purchasing (IMP) project	The matching of needs gradually transforms the exchange between parties into a relationship where the partners are mutually dependent and use each other's surrounding network to create value.

## GLOBALIZATION DEBATE AND BORN GLOBAL FIRMS

International business environment has been marked by the acceleration of two trends that substantially reduced time-to-market abroad: globalization and technological advances.

Notwithstanding the fact that the market appears highly connected in certain industries (i.e. IT and on-line based industries) foreign-led growth may follow non-linear path and encounter market-specific constraints. If we recognize how both globalization and

information communication technologies advance, we acknowledge the substantial decrease in transaction-costs frictions in certain markets, and their industry-specific resistance. However Thomas Friedman's statement "the World is Flat", that depicts the growing globalization and business connectedness, has also to be reconciled with the countervailing facts opposing major forces at place in certain domains (see Appendix 1 - DHL Global Connectedness Index for 2014). As highlighted by Ghemawat "international transactions" are represented only by a marginal extent of the total trade flows: assessed about 10% of the total value of trades. Restricting the focus of the debate to BG firms, this exploratory research is directed to conceptualize firm-networks market potential and scalability.

The research dedicated effort aims to single out critical factors that connect firm-networks and firm-scalability in the pursuit of geographical growth (countries served by a company).

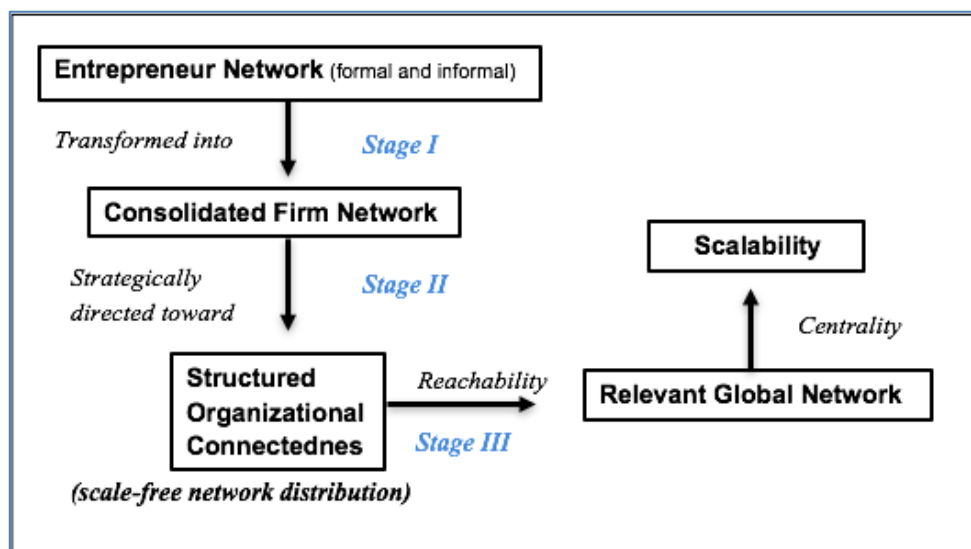
In the first place, the search of critical metrics is initially directed to measure network as an *asset* to be valorized via interfirm activities. We consider both types of social network, namely the relationships originated from the entrepreneur's background and experience and the one that is connected to the institutional role the organization plays in its industry. For example, presenting what has been labelled "international intrapreneurship" (Cavusgil, Knight 2015) - we also analyze ventures born within established companies, that routinely implement multi-country-markets product launch. In this line we will see that Nespresso, a venture of Nestle group, initially encountered difficulties to establish its activities due to the inventor's personal network limitations. However, once the venture branch has been incepted into the organization (Nestlè), and a new entrepreneurial spirit took place, Nestlè could begin to establish network links with the first-tier producers accessible within Nestlé suppliers of coffee-machine. These intertwining network layers (suppliers, entrepreneur resources) soon contributed to the launch of a venture with a global ambitious. While formal network involves established linkages across corporates and institutions, informal ties relies on cooperation and mutual accommodation among various types of agents present in the firm's value chain processes (e.g. Blankenburg 1999). Moreover, the research shed light upon organizational traits connected to the internal connectedness of operations in regard to user's demand and supply.

The research articulates a model which discusses key attributes playing a crucial role in the different stages of the expansion path. A similar approach has been adopted from Rialp et al. (2005) who discusses three dimensions concerning; the founder entrepreneur, the organisation and the strategic focus of the company. The model presented in Diagram 1 specifies four main stages (we assume) characteristics of BG firms international expansion process: a1) BG entrepreneurs start with a global vision and capabilities that are strongly connected to previously built personal network; a2) BG firm potential is dependent to the presence or emergence of a Scale-free distribution within the value chain operational loops (organizational connectedness); a3) Scalability exploitation of BG firms is dependent on the ability to reach a relevant global network; b1) Speed of scalability is proportional to the time needed to reach (industry) central positioning.

We assume that BG firms are an optimal case to study and test the link between network (connectedness structure, centrality, network/value chain relevance) and scalability (breadth, speed of growth), shedding light on two main elements: (1) the transformation of the entrepreneur's social network into a firm extended asset - as the entrepreneur at founding stage is a stakeholder and an agent, s/he employs her social capital asset in building the firms' network, and (2) the degree of firm scalability is relative to the adopted firm-specific value chain control - given internal structure mechanism (see diagram 1). Assuming the aforementioned propositions we develop a model where general conditions are specified in analogy to Knowledge Management dynamics (Hedlund 1994). Similarly to Hedlund's model, we consider a process of appropriation of the social and organizational capital built

around two dimensions: 1) typology of different agents (entrepreneur, team, organization, international entities) and 2) level of formal ties established. In order to explore the level of firm interaction within its Network, we consider three main components that take part in the global expansion process: i) (Communication channels) Sharing knowledge and network requires a medium (agent), a channel and a defined direction of the agents' flow of exchange; formal and informal linkages are established ii) (Network formation) Networks are originated individually and consolidated in shared formal structures; iii) (Technology) Scalability is based on technology connectedness and organization resources availability (complementary assets and capital).

**Diagram 1. From the Entrepreneur's Network to Firm Scalability**



Starting from the Entrepreneur Network (Stage I), in the following sections we will review some key concepts impacting the firm in its expansion process and organizational change. A punctual discussion of each stage will follow.

### **I. From the Entrepreneur Network to Firm Connectivity**

*How personal network can create value for a newborn business*

Dubini and Aldrich (1991) elaborated a definitional model of the entrepreneurial network by classifying two distinct forms of social ties: personal networks - centered on a focal individual, and extended networks - embedded in *environments* of social structure groups. "The term *networking* as a verb, describing entrepreneurial behavior, is usually referring to special kind of relations within personal networks [...] a network built on strong ties, relations entrepreneurs can count on. By contrast, weak ties are superficial or casual, and people typically have little emotional investment in them." (Dubini et al. 1991 p. 307). If we look at network activity as a process, at the beginning of the development of the business idea, the organizational structure does not exist yet, and therefore the entrepreneur only as a person can be considered as active agent, boosting all available resources. However, when the first exchange of goods and services takes place, the focus of attention shifts to the company itself. "To take a simple example, an entrepreneur's personal tie to a friend not involved in his business may, by chance, lead to contacts with persons that can turn into access to new resources for fulfilling firm's needs" (Dubini et al. 1988 p. 306). At early stages, and especially for small size enterprises, searching for resources via normal organizational channels might cost more time or funds than what the organization can afford. Hence, if the right connections are successfully implanted through the entrepreneur and transferred into the

firm's boundaries then the organization can start to draw on a wider space of web connections. Effective entrepreneurs leverage their network resources (contacts, knowledge and confidence) and are more than others able to planning and monitoring network activities and to undertake actions to enhance their network diversity. A key theoretical finding of Dubini et al. (1991) considers three active networks mingled in a whole totality: the entrepreneur, the organization and the environment, all bounded in a continuum of business exchanges. In the following sections we examine some definitional aspects, attributes and related metrics of Networks to be examined from the entrepreneur view. A step to recognize and transform the network into a distinct organizational asset.

#### *Entrepreneur's Small world*

“Reachability refers to the presence of a path between two persons or firms. Persons and firms can be ranked by how many intermediaries a given path requires before one person/firm is indirectly linked with another. Some units are completely isolated from others, as no path can be constructed to link them” (Dubini et al., 1991 p. 310). Therefore, some units belong to separate circles but can be reached by direct links. This attribute is strictly connected to *small world effect* that appears where the network is of a scale-free form. Small world clusters have been characterized by the fact that “most nodes are not neighbors of one another but the neighbors of any given node are likely to be neighbors of each other and most nodes can be reached from every other node by a small number steps.” (Watts et al. 1998 p.441). Considering together *small world effect* and the entrepreneur “extended network”, emerges that a personal asset can turn into an organizational distinct resource (Dubini et al. p. 309) developing a unique network that can defend the firm from competitors, abrupt changes and external shocks. It is worth to mention that reachability implies to consider both types of formal and informal channels. As shown by Barabasi (2016) mapping organizational networks in a mature firm can i) highlight lack of interactions between key units (Top Management Team -TMT) while in parallel ii) show the active role of internal nodes - hubs - at lower hierarchical levels. Considering this added element, reachability implies to explicitly consider effective nodes that have been activated in terms of business exchanges by formal and informal internal units. TMT becomes only one unit among the whole organization to observe and monitor network exchanges.

#### *Diversity - weak ties and strong ties*

Having enough diversity in one's strong ties, includes strongly linked people who have ties established among different parts of the social system. In organizational networks, weak ties concept illustrates how important information channels are bound to the degrees of diversity present at entrepreneurial level. In this respect, the entrepreneur's social network plays an important role in allowing to reach overseas markets and connect to external hubs of similar regional networks.

On the one hand, cultivating different and diverse personal network enhances the possibility of encountering “linchpins” (Misner 2008), defined as people, who, in some way, crossover between two or more clusters of groups, allowing them to link people together easily. Moreover, according to Buchanan (2002), if the number of “distant links” reaches a figure of 20% (of total links in the network) then the network effectively functions globally.

At organizational level a large and diverse chain of suppliers support the formation of extended network capabilities. Accordingly, with Dubini et al.'s model (1991) we conclude that in the foundation of a venture, entrepreneurs pass through stages of development of *personal* and *extended* networks, monitoring, managing and increasing diversity in order to reach the most effective organizational network. Therefore, it is often the entrepreneur activity that positions the newly venture in connection with relevant hubs of the industry at international scale. In the same line Burt's (2000) findings, have investigated as bigger



networks allow entrepreneurs to activate a more diverse and complete set of resources.

## **II. Building on internal data - Structured organizational connectedness**

To measure financial contingency in a business network, Janet Gao (2014) introduced a model capable to measure firm connectivity: firms are represented as “nodes” and the intensity of customer-supplier relationships is represented by the “edges” connecting the nodes. Through these edges, firms are connected to their major customers and suppliers while enhancing further connection to the respective networks. Gao’s model allows edges to present two directions of exchanges but with different weights. The weight of a direction indicates to what extent a firm is affected by its counterpart. Gao’s approach offers a simple way to quantify firm’s connectivity and vulnerability to its customers and suppliers, as higher weights indicate higher dependence. At the same time this structure leads us to draw further reasoning on the ground of connectedness through nodes: accordingly, to Network Theory (Barabasi 2016 p.41) networks are classified in double forms: “the ones that exchange only in one direction (directed) and the one that possess mutual directional exchange (undirected).” To this point, analyzing ‘operational network’ requires to select firm-specific value chain structures established among suppliers and consumers. These structures, elaborated by distinctive streams of internal data, become afterwards capable to raise the company superiority vs competitors and to give form to high-degree nodes. Therefore, applying Gao’s results to BG’s realm, the transferred value between two nodes, through connected edges, can be accounted by the metrics able to capture the flows of information inbound and outbound occurring at firm/customer level. In these line of investigation Blomstermo et al. (2003 p.749) have also illustrated the benefits of BG firms in reference to network ties capable of strengthen their “ability [...] of uncovering business opportunities” by the accumulation of learning loops elaborated in “a process of i) reactive and ii) co-evolutionary feedbacks”. Hence, BG firms characteristically present the ability to benefit from information-based systems taking advantage of the information flows directed and undirected. Particularly, as previously discussed, operational scale-free distribution can steam and evolve based on BG evolutionary line centered on operational feedbacks. Mass of internal data (via customers and suppliers) allows companies to seize growth path exploiting the rise of nodes with high-degree distributions in the value chain operations. These concepts are progressively deepened also in terms of practitioners via new tools: e.g. Organizational Network Analysis (McDowell et al. Deloitte 2016) which aim is to map peripheral, conduits and nodes of the organic exchange of information. Similarly other scholars (Kelly 2009, p. 498) have focused attention on the ability of the firms to recognize “the importance of flexible processes that can adapt [operations] to the innovation context and to experience and learning over time”.

### *Density*

The density of a network refers to the extensiveness of ties among nodes. It is measured by comparing the total number of ties present at certain point in time with the potential number that would occur if complete connectedness had taken place. Applying these concepts to the demand side, firms can highly benefit serving niche segments (low density of the firm customer ties in the market arena) combining it with a presence at international level, supplying differentiated designs and highly distinctive products (e.g. firms that concentrate their value proposition on very specific needs and functions, becoming competitive toward larger companies that need to keep their scope of operations broader). Therefore, for these ventures the value proposition takes a form of a scale-free distribution only if the service/product is able to aggregate mass of global demand with niche attributes. Conversely, random distributions - where each node share the same distribution - can be compared to the case of large multiple offers concentrated in few regions. These latter traits hampers scalability due to the wide array of preferences to serve. Hence, BG firms are typically

involved in operations where offers are directed to “low-density” niche segments, deploying highly focused connected loops.

### **III. From Connectivity to Scalability: reaching a relevant global network**

Scalability has not been strictly defined in literature. One definition refers to the company's ability to grow without being hampered by its structure costs or available resources. In particular Nielsen and Lund (2017) shed light on the dimension of scalability that relates to the ability of the firm's business model to accelerate returns on additional investment. Emphasis is centered upon the rates of revenues growth in respect to the relative increase in costs. Other sources, closer to venture capital and tech ecosystem, have shifted the attention more to the potential rate of growth in terms of production, users or services per sé. For instance, according to venture capital financial terms, Steve Blank (2010) has defined “scalable”, a business aiming to achieve a billion dollars market capitalization, noting as the markets size, since the early days becomes a central variable around which articulate the business establishments and plan the geography of customers and channels to pursue. In other cases, financial index (revenues, profits) have been considered only a second stage of monetization whereas the mass of served users (and its annual rate of growth) have become the reference term of the business value (e.g. the service of WhatsApp mobile app with free calls and texts messages. Instagram had similar path at early stage with the introduction of revenue stream linked to ads only in later stages). In fact, it is common that BG firms measure their pace of scalability in terms of number of users served shifting the attention from the traditional metrics of sales on foreign countries (evaluations are strongly based on the type of mass users and demographics they are able to attract and serve - for instance the competition between Snapchat and Facebook on attracting younger segments of users - eMarketer 12<sup>ve</sup> of February 2018). This development determines a new critical shift toward the importance of intangible assets such as the network client base. Entrepreneur's capability of activating a valuable and relevant network (Harris et al., 2012) critically participate in the growth path of BG firm. An effective online networker can stay small and flexible but still compete with larger organizations on local niche demands. Moreover, to evaluate the organization growth, becomes essential to assess the degree to which nonphysical attributes of the product/service (such as brand, software capabilities, design, functionalities) can boost growth of particular users' segments. Moreover, recent contributions in literature (Hampf and Osterloh, 2014) have shown as the matter of internet start-ups' growth has been fostered also by incumbents developments. According to the debate on globalization previously discussed, the market evolution has connected Multinational enterprises to BG firms in a common role to address main emerging issues: (a) new technologies reducing the cost of communication; (b) new ways of interaction enabling different parties to adopt *innovative transaction systems* and *newly exchange mechanisms*; (c) speed of technological change requiring an acceleration process to up-to-date practices in Information Technologies (clock speed).

In particular BG firms offer incumbents software and technology improvements, such as *automation of processes* (i.e. Artificial Intelligence services), and technical *infrastructure additional functions* (e.g. the block-chain ledger technology for the fin-tech and other industry). In this sense Multinationals become also additional channels that provide BG firms with physical network infrastructure to unleash their service.

Eventually the reachability of a physical network still requires the fulfilment of the condition of relevance of the network. Although this attribute is relative to the firm that exploit its value creation process, network extension and reputation should be carefully considered. Ultimately, centrality positioning is reached by a slow process of reputation growth. Its internal process is governed by a complex set of self-reinforcing loops setting a connection between speed of growth and centrality.

### **A pilot sample to review the theoretical model behind Network and Scalability potential**

We will now review from qualitative standpoint few cases of a first pilot sample representing BG firms that could successfully achieve different levels in the global expansion. Our discussion will review interviews, case studies and company reports that consider three different types of BG firms: i) a new venture that could internationalize in 12 countries within 5 years from its inception (Deliveroo), ii) a venture within a multinational that acted as a proper BG entity (Nespresso) and iii) a “Born-again global firm” (Bell, McNaughton and Young 2001) that found global expansion later in its lifespan but early on once it reinvented its business model due to market radical technological shift (Netflix). This latter case can also shed light upon those companies that go without or with low levels of international activity until some exogenous factors impact the firm (e.g. the online streaming technology) opening a rapid path of international expansion. All three cases represent peculiar examples of the dynamic path followed by BG firms according to the network conceptual modelling presented in Figure 1. Nespresso on one hand offers an important angle to analyze what has been labelled *intrapreneurship* referring to internal start-up evolution taking place at multinational level. As reported from Berssenbrügge (Filou 2006) who covered the CEO role in Nespresso (from 2001 to 2007), he referred to “intrapreneurship as part of the appeal of the CEO position at Nespresso: it was international and had the advantages of working for a startup within a large group.” Overall the three cases offer also multiple lines of comparison crossing three different industries: respectively Video Entertainment (Netflix), Instant coffee (Nespresso), and Online food delivery (Deliveroo). Despite the diversity of the industries, all three companies experienced an exponential rise in the international presence when exploiting their online network operations. For example, in the case of Nespresso, after launching, in 1998 its e-commerce platform, it performed a sustained expansion of its clientele with more than 30% of annual growth. Nespresso passed from 180,000 subscribers in 1996 reaching 2.2 Million in 2006. Netflix went through similar pattern of growth after having introduced the online platform in 2007 and entering international market in 2010. From that year customer base rose toward an expansion path that sustained more than 80% of year-over-year annual growth, passing from about 13 Millions of users in 2010 to 118 Millions (of users) in 2018. Deliveroo a start-up just five years old, could leverage its online ordering platform extending its presence in 12 countries in four years. Sales growth picked with more than 600% increase in 2016. Nonetheless the aforementioned important figures have also to be put in context with rounds of investment that boosted firm expansion with more than 275 Million Dollars of investment reached only at the fifth round of investment in 2017.

In essence, the three cases illustrate how BG network analysis constitute an important field of study in reference to variety of firms at the stage of formation of the scalability potential.

#### **Case #1**

Deliveroo, a web and app-based food delivery service, generated an expansion powered by multiple regional acquisitions of local players resettling operations by superior logistics and online technology capabilities. Capital investment in technology could soon leverage returns by the exploitation of the scalability of a dense intertwined web of brick-and-mortar small shops in need of logistics service. Will Shu, the founder of Deliveroo in 2013, worked as analyst for private funds as investment banker and this initial stage gave him ground to build his personal network to raise at early stage a financial investment for Deliveroo. The platform is now active in twelve countries, 120 cities and account 35 thousands of partner restaurants. The start-up founders and investors had from the initial inception a recognition of an untapped global need. As reported from the an early stage investor H.Kanji (LBS 2017) “The company ...recognized that this demand was global and it expanded internationally quickly. All of this attracted the attention of great investors, which gave it the resources to

make the flywheel work even faster. The lesson for all start-ups is not to be afraid of scaling.” Applying diagram 1 model to Deliveroo shows as in this case the entrepreneurial network was transformed in an important financing lever giving strong boost to geographic expansion and technology superiority (in three years from 2014 to 2017 Deliveroo raised in six rounds of investments about \$859.6 US Millions). According to the second stage of the model, the use of relevant metrics by streams of internal data was also a founding pillars of Deliveroo expansion. As explained by the company’s VP engineer D. Webb (Pudwell 2017) “Data is used in three main ways, the first of which is to support team decisions[...] Experimentation helps us understand product changes we make[...] Graphs help our operations team understand and react to trends and agents all across the business are running queries on our dataset 24 hours a day[...] The second way Deliveroo uses data is to support algorithmic decisions, as machine learning models need to be constantly re-trained to ensure that they are running on the most up to date and relevant information[...] the third and final use of data is arguably the most vital to Deliveroo’s success: Using data to provide real-time operational monitoring[...] Our dispatch engine, [...] is constantly calculating and recalculating the best combination of riders to orders. It does this using predictions for rider travel time, food preparation time etc. and we calculate that using machine learning models which are trained on our historical data.” (Padwell, 2017) This approach is strongly supporting the model case where internal structural connectedness becomes a drivers of scalability. Third stage of the model, (reaching a relevant network and scalability potential) have been a challenge that Deliveroo had to face in regard to the fleet of drivers to be built in each locations. This distinct value chain node was solved by exploiting IT infrastructure capabilities. As quoted from founder Shu “We could actually build a delivery fleet without investing in a lot of customized equipment. It is really the smartphone and the tablet that allow this business to exist” (Arabian Business 2016). Relevant network was in this case built by IT means tapping into spared capacities of people available for the delivery task in each geography.

### **Case #2**

Netflix, an entertainment corporate providing streaming of media and online Video On-Demand (VOD), went through a strong expansion in the later years turning DVDs clientele into online new customers. From the entrepreneur standpoint (Diagram 1 Stage I) founder Hastings could strongly benefit from his personal network built during his first venture: a software company that was focused on broad debug operations. At the same time of the exit he could leverage the technical connections he had established conveying part of the formed social capital into a new business domain based on DVDs and online order. The venture had vision to apply a high-performance digital infrastructure which could leverage the emerging users’ “web culture”. This initial stage created an opportunity to employ enough experts to work on an algorithm that could target contents and mine internal data. Vision and operations gave rise to the organizational value chain thoroughly connected via metrics and data providing information on user experience feedbacks (Diagram I stage II). The online search enabled, from an organizational angle, the technology to provide a bottom line for large scale economies on distribution unleashed via online demand. Demand for movies is in fact a particular example of Power law where few titles cover a restricted range of movies and series that are the most demanded by a large number of people (an histogram following a Power law is a continuously decreasing curve implying that many people demand the same content while coexist a large number of independent viewers with very local demand - Anderson 2006). This latter element explains how, despite the world expansion, Netflix could offer its online service by marketing a limited number of high-selected titles. Exploiting the internal information provided by what users watch could master algorithms predicting whether new content will be successful (superior information on network of

viewers).“We are still a relatively small company employing 2.500 dedicated people. We have to make sure we are focusing our engineering and content acquisition following the data we get from consumers” (Corvin 2017). Titles are based on users’ target segmentation and purchasing data and also mediated by a personalized video-recommendation system based on ratings and reviews. This internal connectedness made able for the company to tap global needs while still satisfying highly differentiated regional demands via links with local distributors (weak ties). On the other hand global potential was not sufficient to allow a feasible path of growth on global level. For this latter stage it was still necessary the *Reachability of a Relevant network* to the industry at global scale. As emphasized from Whiteley (Corvin 2017) the central positioning in the industry setting in motion through superior performance laid the foundation for reaching a global network of local operators and distributors “We are in a lucky position that many companies want to work with us”. This status is typical of *scale-free network* where preferential attachment occurs given the number of ties established from the company with external agents. Global expansion has been possible through partnerships with global consumer electronics partners (Virgin, Com Hem, LG, Samsung and Apple - Corvin 2017). Scalability potential is therefore assured on the basis of a user’s need responding to a Power law distribution and the reachability of a relevant Network for distribution.

### **Case #3**

Nespresso, a coffee brewer, was founded on the idea of Eric Favre, an employee of Nestlé, who invented, patented and introduced the Nespresso system for instant coffee, initially without significant success. Nespresso SA company was founded only ten years as a separate entity from Nestlé. After the end of 1987 the company was struggling to meet the targets. A new entrepreneur was hired: “a different management style was needed” (IMD 2003). Jean-Paul Gaillard was selected as new CEO, with his track records of having launched in Europe the Marlboro Classic brand, a men’s clothing line for Philip Morris. This experience gave him a solid base of knowhow in framing a new distribution strategy for the company, accordingly to the one used in building a new brand community (Marlboro country high-end casual outfits). He radically shifted the initial B2B commercial strategy targeting instead household realm. Soon after his arrival, he launched the creation of a “Nespresso Club community” together with a whole new distribution model where the business was tightly dependent on Telephone and Online sales. Club was strongly rooted in cities more than countries with a presence in strongholds where coffee culture had already been diffused (Canning 2009). Furthermore there was a stark commitment to fulfill a growth from 150k SFr to 1 Billion SFr in ten years. These first developments are consistent with the Diagram 1 Stage 1 -where CEO Gaillard put in place personal resources drawing on methodologies, knowhow and network extensively used in his previous venture. Organizational connectedness - Stage 2 - was also reached through mechanisms that allowed to start monitoring customer choices. Club new members were tracked closely based on the assumption that long-term consumption habits were formed in the usage of the first months. Club established a preferential channels with customers benefit from 24-hours customer service, by mail, phone, fax, and email. Distinctively, Club user base established the organizational level of connectedness between company and users by internal data control (receiving orders online/telephone/email/fax built user-profile database and tracking-system for each purchase at personal level). Establishing this organization-customer contact allowed an efficient and prompt data control of users’ choices and feedbacks in each local market, also employed in new blend proposals. Club channels were also integrated with the physical distribution of the third-party vendors of Nespresso machine - that focused on particular cities with coffee culture. This latter layer created the potential for reaching the relevant

network for Global scalability (Diagram 1 Stage III). First-tier machine producers were involved together with regional players: “As part of a new multi-partner trade approach offering broader distribution, new machine partnerships are forged in Switzerland, France, Benelux, USA” (company website).

**Table 2. Network Stages of Relevance and Scalability Potential**

<b>Business Case</b>	<b>Diagram I Stage I From Entrepreneur to Organizational network - Hyp a1)</b>	<b>Diagram I Stage II Organizational Connectedness - Hyp a2) Potential of power law distribution</b>	<b>Diagram I Stage III Reachability of a Relevant global network -Hyp a3)</b>	<b>Scalability potential - Hyp b1)</b>
<p><b>Deliveroo</b> a Delivery start-up founded in 2013 with presence in 12 countries after 4 years</p>	<p>- investors had from the initial inception a recognition of an untapped global need; - the entrepreneur’s use of personal network to raise at early stage financial investment</p>	<p>- structure a machine learning system processing and improving performance of the localization of rider and restaurant locations. Timely control over orders/delivery.  Organizational connectedness over drivers distribution. (potential power law over drivers vs city location: 80% of sales comes from 20% of locations)</p>	<p>- Establish a newly network of supply drivers with global presence via IT system. This newly established network allows to reach global scale.</p>	<p>Automation of processes (fleet hiring contracts, vendors rule of engagement)  Infrastructure level (ads, mass users contacts, marketing exploiting users` data on sales)</p>
<p><b>Netflix</b> faced a technology shift (from DVD delivery to an online streaming). In jan. 2007 Netflix starts streaming online videos. In 2016 launches services globally in 130 countries. In 2017 more than 50% of the subscribers are international.</p>	<p>- vision to apply a high-performance digital infrastructure to leverage the emerging users` “web culture”  - the entrepreneur use of personal network built during his first venture - a software - company that was focused on broad debug operations</p>	<p>- structured a data system algorithm able to learn the and improve the proportion between user’s demand and limit the number of titles offered  Organizational connectedness on users titles selections (potential power law over titles vs regions: 80% of the revenues come from 20% titles)</p>	<p>- online streaming become a source for global expansion through acquisition and distribution of videos and movies to broad public featuring top-tier series (e.g. House of Card 2013)  - Global Network of local movies producers</p>	<p>-automation of processes: partnering with tech mobile companies: LG, Samsung, Apple in integrating apps  -infrastructure level: local offering partnering with platform channels, global consumer electronics partners</p>

<p><b>Nespresso</b>          focused on instant coffee business targeting households. Established in 1986 as an independent company: Nespresso SA- Nestlé Group. Starts Nespresso Club. Passed from 2.700 members in 1990 to 250.000 in 1997 Present in 66 countries in 2018.</p>	<p>- a vision for a business of 1 Billion and tapping a global market: coffee household consumption          - expertise in building brand community influenced the ability to launch “Nespresso Club”</p>	<p>- orders (mail, operators, fax, website) are placed and processed by the system          Organizational connectedness over coffee blends/local preferences (potential power law over blends vs regions: 80% of revenues from 20% of blends)</p>	<p>- consumers are reached through Nespresso Club (sales partner turn purchaser into member)          -global relevant Network of third party machine producers with spread Point of Sales in major cities</p>	<p>-automation of processes (vendors of machines, licensing retailers, brewer coffee mix supply)          -infrastructure level: Nespresso Boutiques + Third parties retailing chains</p>
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Therefore, the organizational network could benefit from licensing machine production and retail to many big manufacturing players. Capsules were instead, maintained exclusively distributed via the Nespresso retail chain, favoring the strong-ties to the customers, and gathering data-base of their tastes and personal purchases. The link between machine distributors and Club member was designed in transforming each new purchaser of a Nespresso machines into a new Club member.

## CONCLUSIONS

In investigating the underlying factors that link BG firm’s network to scalability, this paper presented a dynamic model characteristic of BG firms in fast pace of global expansion. The analysis encompassed entrepreneurial and organizational distinctive factors related to Network properties. The approach adopted was elaborated drawing upon conceptual findings originated in Networks Science (small world effect, scale-free network, and centrality). Its scope resides in the attempt to demonstrate that the scalability of BG firms is related to a complex but systematic growth mechanism led by strategically relevant network properties. The paper has addressed a less investigated literature field examining the network factors that underlie the ability of BG and INV firms to become global at fast pace. An initial in-depth review of the extant literature has helped in building a framework to categorize main approaches that explain BG phenomenon. Two strands have been recognized in the literature in relation to the Network perspective: i) taking the *RBV* approach, Network forms are conceived as new resources to convey information and knowhow, via learning paths, to the firm; ii) considering the *Network-per-sé* approach, models elaborate upon idiosyncratic network attributes based on Transaction Cost theory. Despite both branches of research acknowledge important aspects of firm network, empirical observations have not yet been fully theoretically reconnected. We propose a novel framework that illustrates how network aspects are shaped by an evolutionary path of expansion of BG firm.

Three main aspects of BG firms have formed the model rationale shedding light on network factors related to i) entrepreneurial key assets, ii) organizational operational connectedness and iii) degree of scalability and potential.

The first section of this research has focused on the role of the entrepreneur in the organization’s network formation. Findings support the hypothesis that BG entrepreneurs are born with a vision to tap a global need and possess personal network/skills to address the core challenges.

By the model second stage, the research explored the concept of *organizational connectedness*: the firm growth potential was examined in respect to the degree of connections with suppliers and users. The aforementioned connections are established via characteristic dynamics in processing information stemming from operations with potentiality to turn into scale-free distribution. BG connectivity represent also a driver for the firm to boost performance and gain in short time superiority in the industry, and favoring the acquisition of a central positioning (hub).

The third stage has concerned the scalability concept and dealt with the capabilities employed by BG firms to reach a strategically relevant network widespread at global level. As discussed, although this element (i.e. strategically relevant global network) is crucial for establishing a physical global presence, ties and frequency of exchange vary from case to case, impacting the speed of growth. Sometimes the network must be established anew (i.e. the pool of drivers connected by IT platform of Deliveroo) or partnering with third-part multinational distributional channels. Speed of scalability has resulted a factor less defined by the present qualitative analysis, remaining dependent on both centrality and relevance of the network. More in-depth analysis seems necessary for this factor to better define and establish transmission links.

The paper has also provided an application of the model to the analysis of three BG firms: Deliveroo, Netflix and Nespresso. This first pilot sample has showed as the BG concept is widely used also in Multinational environments (e.g. Nespresso) where high growth is requested since the early days similarly to companies that set new starting course due to environmental changes. All three companies have presented adherence to stage 1 model, beginning their paths through entrepreneurs that already possessed a personal network that was turned into an organizational asset (Hyp a1 confirmed). Seizing global needs have emphasized the presence of BG firm operations governed by online organizational connectedness. As a whole all three firms seem to focusing their offers into specific niches that reconnect to regional markets. Their organizational network of online operations could set in motion an important supremacy on the flow of information about users behaviors. BG potential could be exploited through the search of power law distribution characteristic of key value chain nodes (Hyp a2 confirmed). Third, the three BG firms also fulfil the requirement of reachability of a relevant global network physically deployed at regional level: e.g. the drivers for Deliveroo, the third-party machine producers for Nespresso, the local movie distributors for Netflix (Hyp a3 verified). This latter stage results critical to create the nexus of BG firms in connecting firm-specific capabilities and Network resources. Speed of Scalability could not show a definitive relation in regard to the sample of firms analyzed. (Hyp b1 not confirmed).

### **LIMITATION OF THE RESEARCH AND FURTHER RESEARCH NEEDED**

The main contribution the research aims is to offer a systematic analysis of factors related to networks in reference to the entrepreneurial and organizational set of resources that the firm can activate in a process of expansion. The results of its application, although in a pilot exploratory stage, already provide some indications systematizing multiple theoretical concepts relevant to distinguish between entrepreneurial and organizational levels. The promising trajectory crossing this rich field of literature leads us to expect that more empirical analysis will reinforce or reject the relevance of the conceptual constructs depicted by the model. The second hypotheses regarding the operational connectedness has been limited to the collection of qualitative data that could prove the existence of loop-processes in operations *capable to gain* power law distributions. Inversely, it *has not been confirmed the existence of a power law distribution* in regard to a specific firm as data was not available. Collection of firm specific data may also enhance and refine the research



theoretical structure. In particular, the extension of the present research to larger samples, with an in-depth exploration of quantitative empirical data, will enable better understanding of the roles of Networks across the different value chain stages. To these purposes the model need to be enriched with quantitative metrics: i) extensive research could delve into startups' entrepreneur network measuring the capacity of establishing international channels on suppliers, distributors, investors and innovation networks; ii) the engineering of a new index capable to capture the network value generated as a whole from the organization (vs investment). This index should operationalize the economic return set in motion from investment in processing data information coming from external exchanges. Similarly, to broader measures such as ROCE - Return on the Capital Employed, RON (Return On Network) could point to measure the capital expenditure dedicated to R&D in technological investment on data processing. This measure could extend the list of intangible assets (Haskel, Westlake 2017) that high-tech new ventures and incumbents are pursuing.

GCI employs data that measure globalization through four main unit of analysis: Trade, Capital, People, Information. Two main categories are adopted to rank the level of global connectedness: "Depth of globalization" and "Breadth of globalization". The framework stresses also the importance of flow of information over the four categories observed while measuring the distance (cultural, administrative, geographic, and economic) present in international interactions. The index is released on annual basis and chaired by Ghemawat who published in 2017 "The Laws of Globalization and Business Applications" Cambridge U. Press.

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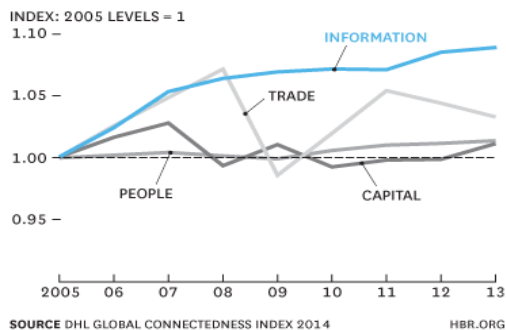
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## APPENDIX I - Global Connectedness Index - DHL (2014)

### GLOBALIZING AT DIFFERENT SPEEDS

Information flows keep growing, but trade, people, and even capital find it harder to cross borders.



Fox J. (2014), The World is still not flat, November 2014 - Harvard Business Review [hbr.org/2014/11/the-world-is-still-not-flat](http://hbr.org/2014/11/the-world-is-still-not-flat)

## APPENDIX II - Terminology

**Hub:** it is a concept in Network Science that refers to a node with a number of links that greatly exceeds the average. Emergence of hubs is a consequence of a scale-free property of networks. Barabási, Albert-László. Network Science: Graph Theory. (2016 p. 27)

**Scale-free Network:** Scale-free network is opposed to random-network where most nodes have comparable number of links. Scale-free networks (Barabási–Albert model) are different from random networks (Erdős–Rényi model) in two aspects: growth and preferential attachment. (Barabasi 2003 p.52)

**Dis-connectivity:** Ghemawat (2009 p.4)) argues that there are few agents that are globally connected (less than 10 percent) “The levels of internationalization associated with cross-border migration, telephone calls, management research and education, private charitable giving, patenting, stock investment, and trade, as a fraction of gross domestic product (GDP), all stand much closer to 10 percent than 100 percent.”

**Small world and clustering** (Zaidi 2012 p.2) Small world networks have two structural properties: small world effect and clustering. “The small world effect is the concept where any two nodes in a network are connected to each other through a small path... The concept of clustering is the idea where two nodes having a common neighbor have a high tendency to be connected to each other.”

**Long tail:** Anderson (2006) “In particular start-ups can concentrate their value proposition on very specific need and function becoming competitive toward larger companies that need to keep their scope of operations broader.”

**Retention rate:** it is used to count customers and track customer activity irrespective of the number of transactions made by each customer.

**Power law:** also called the “Scaling law” can be used to describe a phenomenon where a small number of items is clustered at the top of a distribution (or at the bottom), taking up 95% of the resources.