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Glocalized Production: The Evolution of Global Production

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Abstract

In light of the challenges of the current globalized production model, four global Danish companies were interviewed with the purpose of exploring “glocalized production” as the new step and solution to the challenges of the “global village.” The research sought to gauge the interest on “glocalized production” by key managers of these companies, and test three hypotheses: that a definition could be established from “glocalization” aspects, that it will reduce supply chain complexity, and that it can affect organizational trust levels. The results are presented along with suggestions to pave the way for future research on this emerging topic.

Keywords: Glocalized Production, Decentralized Supply Chains, Global Supply Chain Challenges

Introduction

In the past 20 years, geopolitical events, technological developments and the deregulation of trade have made it possible to move manufacturing processes to emerging economies, discarding the old norms of “local for local” manufacturing in favour for the new “global village” (Christopher, Peck, & Towill, 2006). However, these “low cost” developing countries are catching up quickly as a result of the redistribution of economic activities (Hesse & Rodrigue, 2006). GDP in developing countries is growing and with it social benefits that cause the increase of salaries, and at the same time regulations are becoming stricter (Hadar & Bilberg, 2012).

On the other hand, the scarcity of resources, market instabilities, highest oil prices ever and volatility in commodities and raw materials are some of the reasons forcing manufacturers to re-examine their business models and global footprints (Hadar & Bilberg, 2012; Petersen, Bilberg, & Hadar, 2012). In light of these emerging issues, research has yet to find a clear understanding on how to respond to the challenges of globalization locally (Hesse & Rodrigue, 2006), and especially in direct relation to the supply chain and production.

Although the global production model becomes increasingly more popular, it has weaknesses such as more diverse supply chains in respect to expanding production

bases overseas, difficulty transferring tacit knowledge in overseas production sites, securing efficiency in inventory and quality control, and the growing risk of technology being leaked (Kang, 2010). The more dispersed a company's sites become, ever-present issues like where to allocate production to be the most responsive, how to maintain low production and transportation costs, and how to transfer related technology at low costs, become more complex (Jaehne, Li, Riedel, & Mueller, 2009).

Responsiveness, customization, and flexible capacity are some of the keys to satisfy both the increasing number of facilities and decrease the supply chain complexity, which can be accomplished if a distributed structure is implemented in the supply chain (Hadar & Bilberg, 2012). Although decentralized supply chains are more flexible and more likely to withstand turbulences, they are still global and suffer the aforementioned disadvantages of the global footprint, thus the next step would be completely "glocalizing" the production. Glocalization is a theoretical concept coined by Robertson (1994) combining the words "globalization" and "localization." Glocalization theory emphasizes the coexistence and interpenetration of the global and the local and it fuses relationships, balance, and harmony between cultural homogenization and heterogenization, standardization and adaptation, homogenization and tailoring, convergence and divergence, and universalism and particularism (Robertson, 1995) to achieve optimization of companies' business activities (Svensson, 2001). So, in this vein, separating the regions of the supply chain and creating alliances with local partners can be the way to solve these issues, and for this purpose suppliers and partners must also operate on a glocalized structure in order to fully complement the supply chain and make it responsive, flexible and less complex (Hadar & Bilberg, 2012).

Methodology

A multiple case study methodology was chosen for this research as this is apt for a business study (Yin, 2009) and helps to shed light on multiple perspectives (Blumberg et al., 2011), especially given the quality of newness from this research (Eisenhardt, 1989). The study was conducted with four global Danish firms of different industries with an interest on the topic. Semi-structured interviews were carried out to know the key informants' perspectives and the findings of existing literature (Blumberg et al. 2011), and find relevant patterns and themes (Schensul & LeCompte, 2013).

The importance of this study is based on the fact that companies with global footprints face costly challenges in regards to this, and that they have a need for a solution. The case studies had to be taken from global companies that were accessible to the authors, thus four global Danish companies were chosen. Table 1 shows the characteristics of these companies.

Table 1 — Companies characteristics. (Source: Amadeus Database)

Nomenclature	Product/service	Employees worldwide	Location			Global revenue
			Home	Production facilities	Continents	
Company A	Consumer goods	10.000	DK	5	2	< 5 billion €
Company B	High-tech components	20.000	DK	7	3	< 5 billion €
Company C	Automated solutions	1.000	DK	4	3	< 500 million €
Company D	Measurement instruments	400.000	DE	>100	All	> 50 billion €

It is important to note that no two companies belong to the same industry, reason why comparisons among them could not be done for the sake of validity. This was achieved by interviewing key managers from the same business area (supply chain and logistics). This and other characteristics can be seen on Table 2. The informants were all interviewed under the same template about their companies' supply chain footprint, the challenges in it, the supply chain strategy, keys to success, the supply chain culture and use of local resources.

Table 2 — Interviewees characteristics.

Company	Date	Informant's occupation	Office location
A	5 March, 2013	Global planning and distribution	DK
B	4 March, 2013	Global Logistics and Supply Chain	DK
C	14 March, 2013	Corporate Logistics and Supply Chain	DK
D	17 April, 2013	Sales Order Entry and Outbound logistics	DK

Hypotheses

A series of hypotheses arose from the study of relevant literature during the early stages of the research.

1. Glocalized production can be defined from “glocalization” aspects and framed in terms of the companies goals, drivers and challenges

The main precedent for this research is the notorious need for a solution to address the challenges in global supply chains. However, although Hadar and Bilberg (2012) first propose the term to group the initiatives to address these challenges, there is no clear understanding of what glocalized production is. The supply chain footprint and its challenges, strategy, keys to success, culture and use of local resources, are aspects that the literature points out as deeply linked to “glocalization.” As “glocalization” is part of the glocalized production concept being developed in this study, these aspects of “glocalization” were considered for the data collection. From there, the authors of this research hypothesized that a concept of glocalized production could be established from the study of the goals, drivers and challenges a global company faces.

2. Glocalized production will reduce supply chain complexity

As previously elaborated, one of the main issues of the global supply chains is the footprint complexity. In a summary of today's global supply chain challenges, Petersen et al (2012) state that the more global a company is, the more complex the supply chain becomes due, for example, to the larger distances to coordinate shipments that increase lead times, transportation and logistics costs and inventory levels. Based on the work by Hadar and Bilberg (2012), it was hypothesized that glocalized production could reduce supply chain complexity.

3. Trust levels can be affected by the deeper involvement of local factories, offices, suppliers, etc.

This hypothesis was established based on the study of the relationship between organizational culture and trust. Organizational culture can be seen as "a system of shared values . . . and norms that define appropriate attitudes and behaviours for organizational members" (O'Reilly & Chatman, 1996, p. 160). In Pagell's study (2004), organizational culture has been analysed as an enabler or inhibitor in the integration of operations, purchasing and logistics in organizations (Pagell, 2004). Culture in an

organization as fostering groups to work toward a congruent goal (Wilkins & Ouchi, 1983). In this way, culture also aids in the building of trust (Jaehne et al., 2009). However a lack of convergence in cross-cultural environments impacts organizational performance (Cox, 1991; Nemetz & Christensen, 1996) and can result in a collapse of trust (Doney, Cannon, & Mullen, 1998), which would not aid in the trust-building and learning processes in a supply chain (Kidd, Richter, & Stumm, 2003). Thus it was hypothesized that trust could be an issue for glocalized production given the less homogeneous organizational culture product of the global village influences.

Case studies

Company A

Until recently this company was mostly European, however it has seen a rapid expansion that is changing the role of the base or home location. It now has production in five countries and two different continents, looking to expand production to a country in a third continent, and a supply chain with a worldwide footprint. The basic elements of the products tend to be produced in mostly the home location, whereas packaging and labelling for example are done locally. This is an example of a decentralized supply chain. Figure 1 shows this structure of production. Upstream, the production model favours globalization more than localization, whereas downstream the opposite occurs.

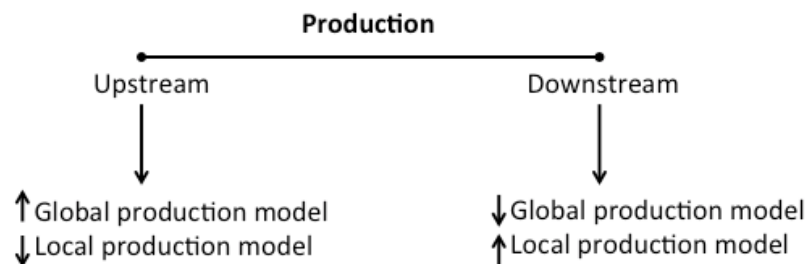


Figure 1 — Company A's production model.

Now that production is not limited only to Denmark, a challenge this company faces is that of keeping all products to the same standard. On the other hand, the documentation of the processes is subject to variations among the various locations. The expansion also means an increasing footprint complexity, and this makes it more difficult to make accurate market forecasts and drives transportation, logistics and inventory costs higher.

A key to success is the ability to keep the retailers' shelves full with the right products, which means the supply chain is flexible enough to adapt production to the needs of the retailers.

The company's culture places value on customer feedback and collaboration between the production and supply chain with the product designers. This way products are designed along with the planning of where to source them and how that would affect costs along the supply chain. It fosters the exchange of employees from one department to another in order to drive his or her department's agenda and increase awareness of the operations in other areas of the organization. Thus they use this to build on trust and it is a heavy basis for the company's culture.

The strategy of the company is to be close to the market and keep production costs low. Doing this in turn increases their capacity to be responsive and their ability to be flexible and adapt to the market demands.

The current production model only makes use of local resources partially. It is becoming insufficient under the rapid expansion, thus it is not sustainable even in the

next three to five years. For the informant, the only way to change this situation and to capitalize on the expansion is to implement the use of local resources upstream as well as downstream in all the markets and this is what he named as glocalized production. When probed on whether glocalized production will reduce the supply chain complexity, he explained that will not be the case as new and unknown complexities will arise that will also need to be managed. One that he foresees is that in order to better apply this upstream the company faces the need for new production technology that can simplify building new factories closer to the markets, but he stated that this regardless signifies a high investment for the company.

Company B

This used to be a Danish company with Danish and European focus that now has a global presence. It now has production in seven countries spanning three continents. In an example of the supply chain, a factory that is meant for production to the local market where it is, receives the majority of supplies from a far away area, and only a minority of its products are for the local market, which translates into a high supply chain footprint. This can be seen on Figure 2. However, these minority products are exclusively for the local market, which means the product portfolio of this company is high.

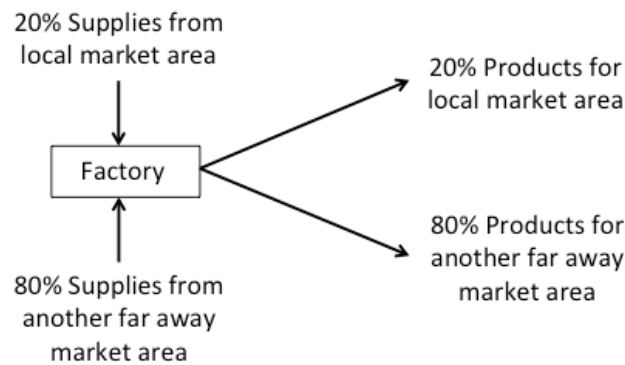


Figure 2 — Company B's production model.

This production model has a high complexity level. The vast product portfolio and high footprint make high inventory levels, driving those costs up as well as those of logistics and transportation. The reason why this is the case is because this company has been unable to find suppliers that fulfill its high quality standards in the locality of the factories. Another issue is that the tacit knowledge of factory workers when production was done exclusively in Denmark was not properly recorded and cannot be transferred to workers in the new facilities. The informer stressed on this point the need for better product and production documentation.

The keys to success are the products' high quality, reducing the lead-time and managing the company's three main KPIs: delivery service, balanced inventories and costs.

The company's culture fosters a positive in-house competition among the production sites. The company operates with teams, where some are more locally focused and some are more globally focused. The more locally focused teams work in close relations with the global team, and this way a high level trust is fostered among the different locations.

The strategy is to produce close to the customer to get a high delivery service and lower transportation and logistics costs and inventory levels. To truly accomplish this the informant recognized the need for a more glocalized production model, where

production and sourcing are done self-sustainably in all regions. Keys for this are to find the right local suppliers and have new production technologies that allow the company to “copy and paste” factories where it needs them.

Company C

It has production in four countries spanning three continents. Most of the suppliers are in two of the continents, which means they are responsible for supplying to all factories around the world. The home factory is the biggest and produces all range of products, whereas the other factories don't produce the entire range. If, in one of their respective areas, a product that is not produced there is needed, it will be sourced from the home factory. The objective of their production model is to produce in the factory of one area what is needed for that market and to produce on demand. The production model can be seen on Figure 3.

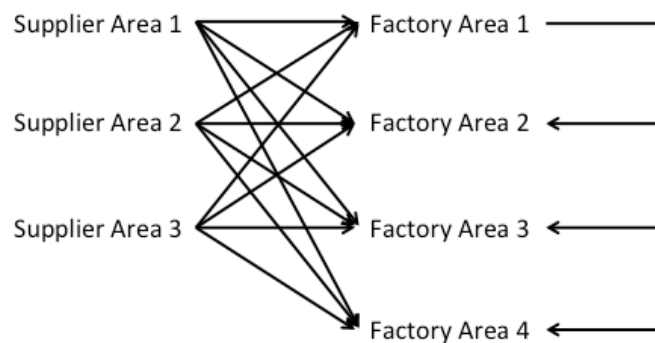


Figure 3 — Company C's production model.

Difficulty in finding the right suppliers of resources (materials, suppliers, etc.) made it so this model has a supplier in one area that supplies to several factories in different geographical locations, this way the lead-times upstream are high, and much higher still compared to the demand time. Thus, the challenge in this setting lies on managing the balance between supply and demand. This translates into higher costs in inventory, transportation and logistics, and a high footprint. On the other hand, the technology necessary of this company's products is very advanced, which also complicates its transfer to new factories. The documentation of the company is based on the Danish culture, and the informant noted that it poses a challenge to train employees in other locations based on this documentation.

The keys to success are being flexible by producing both standardized and customized products, and the capacity this company has for mobility. When a customer changes location, the company follows them.

Knowledge transfer is done horizontally and vertically within the company, and even though processes are standardized there is a culture where employees are encouraged to challenge the processes to improve them. Then they are standardized again and the process is repeated. This in-house flexibility fosters a high level of trust among employees in all locations.

The goal of the supply chain should be to keep it decentralized, i.e. so an area's factory produces only for that area. However, the informant states that because of key suppliers and the home factory being the only one able to produce all range of products, the company still has a lot of moving parts all over the globe, which results on high lead-times and transportation costs.

Company D

This company is an exceptional case. The main factory for this company's division is in another European country, but Denmark has an important factory and other main competencies. The division also has two factories in a second continent and one factory in a third. Suppliers are both Danish and worldwide. The products from all factories are brought over to Denmark and joined with those produced in Denmark. From then, half of the products are sold directly to the European market. The other half goes to a third European country that possesses the certifications to sell the products for the worldwide market. This is summarized in Figure 4.

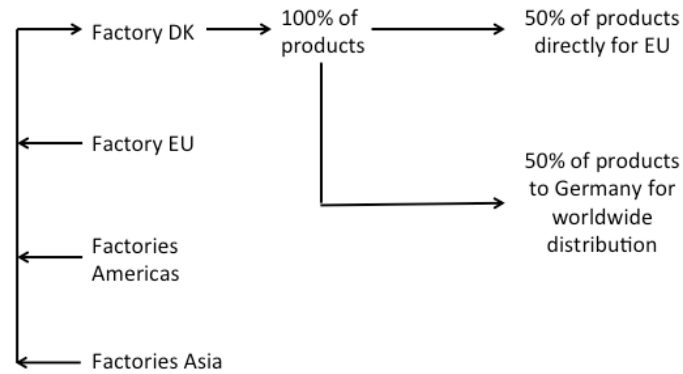


Figure 4 — Company D's production model.

The biggest challenge is that, since the Danish factory lacks the certification needed to directly distribute worldwide, the transportation and logistics costs are high, as well as the supply chain complexity. This also affects the delivery times and environmental impact.

The processes and practices are very standardized and the strategies are to be close to the customer and align the prices among factories in order to reduce in-house competition.

On the other hand, the keys to success are the high quality, made possible by the specialized technology and a strong streamlining.

There is not much contact among production facilities, although they all fall under the company's umbrella of a standardized culture, which results in high trust levels.

However processes can be adapted to local knowledge as long as they are measured under the company's KPIs. The supply chain depends on local factors (e.g. suppliers), and vendors and factory employees are local. The informant recognizes the importance of using local resources, however this location is dependent on others for operations.

Results

Hypothesis 1: Glocalized production can be defined from "glocalization" aspects and framed in terms of the companies goals, drivers and challenges

The data from the interviews was filtered according to the main points the informants stressed and grouped according to the categories goals, drivers and challenges. The goals are all the objectives the company wants in place for it to fulfil its corporate strategy, mission and vision. In order to achieve these goals, key activities and resources are in place in the companies as their drivers. And finally, it is important to consider the challenges that the companies face. Tables 3 to 6 show these main points according to these three categories for each company.

Table 3 — Goals, drivers and challenges of Company A.

Goals	Drivers	Challenges
Expansion	Decentralization	Standardization
Close to customer	Flexibility	Documentation
Low costs	Collaboration	Footprint complexity
Flexibility	Culture	High inventories
Responsiveness	Trust	Transportation and logistics costs
Local resources		
New production technology		

Table 4 — Goals, drivers and challenges of Company B.

Goals	Drivers	Challenges
Quality	Quality	Footprint complexity
Lead time	Trust	Product portfolio
Delivery service	Local resources	Inventories
Inventories		Transportation and logistics costs
Low costs		Suppliers
Close to customer		Tacit knowledge
New production technologies		Documentation

Table 5 — Goals, drivers and challenges of Company C.

Goals	Drivers	Challenges
Close to customer	Close to customers	Suppliers
Flexibility	Quality	Lead time
Standardization	Mobility	Supply vs. demand
Customization	Standardization	Inventories
	Knowledge transfer	Transportation and logistics costs
	Culture	Footprint complexity
	Trust	Technology transfer

Table 6 — Goals, drivers and challenges of Company D.

Goals	Drivers	Challenges
Close to customer	Competencies	Certifications
Aligned prices	Standardization	Footprint complexity
	Quality	Transportation and logistics costs
	Trust	Lead time
	Local resources	Environmental impact
		Dependency

A common denominator of these companies' goals is to be close to the customers in order to face the challenges of increasing footprint complexity and transportation and logistics costs. Flexibility and responsiveness in the supply chain are keys to accomplishing this and make their appearances as both goals and drivers. Local resources appears as goal in the first case and drivers in the second and fourth, whereas suppliers, which can be seen as a form of local resources, are a challenge in two cases. The informants of the first two companies pointed out the need for new production technologies that can make possible the "copy and paste" of factories where they are needed in the world that would make globalized production a reality. However,

developing, implementing and transferring this technology signifies a great investment in resources for these companies and they surmise only large, global companies have the financial backing for this.

Hypothesis 2: Glocalized production will reduce supply chain complexity

As anticipated, this aspect was clearly stated by the informants as the wall to climb over. Although they recognize that taking the step beyond decentralizing the supply chain and completely dividing the markets and giving autonomy to the respective factories would reduce the current supply chain footprint complexity, it would cause new unknown complexities that will need to be managed. Under this state of uncertainty, they dismissed the notion that glocalized production could reduce footprint complexity in absolute terms. In other words, the sum of complexities post application of glocalized production might be equal or more than in the globalized system.

Hypothesis 3: Trust levels can be affected by the deeper involvement of local factories, offices, suppliers, etc.

Linked to the company's cultures, the informants stated that trust is homogenous and is not an issue within their companies among offices and/or factories in different locations around the world, contradicting one of the main conclusions of the research by Kang (2010).

Conclusions

From these results, a concept of glocalized production was developed by the authors:

“Glocalized production is about global companies taking advantage of the local resources available in the different locations where they have a presence. It can be used as a driver to reach the company's goals, while addressing many of the current challenges in supply chain and production. It is an investment only large and stable companies can carry, and it go along with production technologies that allow for companies to apply this model and harness its full potential.”

Seeking to universalize the concept of glocalized production, further exploration on the topic can be done by comparing global companies in the same industry, and that way measure if glocalized production would have an impact on them based on the industry umbrella, or if its impacts would depend on the company in particular, its corporate strategy, governance, culture, competitive advantages, etc.

With regards to the trust hypothesis and its role in glocalized production, it would be of interest to study Danish global companies vs. other international (i.e. German, Chinese, etc.).

Another alternative would be the in-depth study of a global company making the transition to glocalized production in terms of employees from different departments, where the repercussions of glocalized production could be measured for all business units.

The fourth case differs from the other three in that this company is not the main production facility of this company's division, and it shows a strong dependence to the other locations. It would be of interest to study the relationship between such a subsidiary and the main location.

Studying the relationship between suppliers and the different locations of a company would also shed light on how glocalized production can be achieved between a company and its partners.

Finally, most interviewees pointed out that, although glocalized production seems to be the solution to the challenges of globalized production, the question truly is how to

implement it. On this point, the lack of competences and how to handle the capacity challenge at the different production sites needs to be kept in mind. The possible answer they offer is through new production technologies, perhaps like changeable, modular and reconfigurable manufacturing systems, or others that have yet to be developed. It would also remain to be studied how the new complexities of glocalized production can be managed. Thus it shows that this is a critical area that needs further study in the future.

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