

Service Provision in Knowledge-Based Industries – A Global Study on the Tooling Industry

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ABSTRACT

In today's times, more than ever cost competition and high demands of globalized value-adding chains put strong pressure on small- and medium-sized toolmakers. As an exclusive differentiation in price is not an option, new means for achieving sustainable competitive positions have to be found. A promising approach for differentiation is to enhance the existing range of products by offering customer-specific services within so-called industrial product-service-systems. However, the lack of local presence inhibits the toolmakers' abilities to deliver these services to their global customers. To address these challenges the European R&D-project TIPSS has the objective to develop suitable methods, techniques and technologies, for toolmakers to improve their local and global performance thus enabling them to offer industrial product-service-systems on a global scale. The basis of the project is a large scale toolmaker and parts producer survey focusing on service provision. The survey identifies the global footprint of toolmakers regarding the provision of tool-related services. Key findings of the survey with respect to designing industrial product-service-systems are presented in this paper.

Keywords: Production Engineering, Product-Service-Systems, Tool & Die Making

1. Introduction

Today's turbulent economic environment confronts the global tooling industry with serious challenges. Cost competition and the high demands of globalized value chains put pressure on small- and medium-sized toolmakers. As a sole focus on price does not lead to a sustainable competitive advantage, toolmakers in high wage economies have to find new means for differentiating themselves from their competitors or else become easily replaceable for their customers [1–3]. One approach for differentiation is the forward integration into the customer's value chain [4,5]. By offering enhanced product related services via so-called industrial product-service-systems (IPS²) [6], certain aspects of the customer's value-adding chain can be provided by the toolmaker. IPS² are hybrid products consisting of the product itself combined with a comprehensive set of product-related services [7–9]. While generating additional cash-flows along the product's entire life-cycle, IPS² increase the dependence of the customer towards his toolmaker strengthening the competitive position of the latter.

In order to develop IPS² that truly deliver added value, the toolmaker is challenged to acquire a profound knowledge of his customer's needs. Based on this knowledge he can define a portfolio of relevant services and develop the appropriate technological solutions. In the following the concept of IPS² is elaborated and, based on an extensive survey, an overview of the capacities and competences of today's toolmakers pertaining to the offering of IPS² on a global level is given.

2. Industrial Product-Service-Systems

Linking innovative services to the core product and thereby creating industrial product-service-systems is maybe one of the most promising ways to create more customer value and to gain a true competitive advantage [10–12]. Especially the tooling industry has not yet benefited from this “new manufacturing” that enables producers to profit from higher service profit margins, growth opportunities in mature markets and longer lasting customer relationships.

In the TIPSS project, the concept of industrial prod-

uct-service-systems encompasses the integration of the toolmaker into the customer’s value chain. The toolmaker thus becomes an integral part of the customer’s production process, increasing the dependence of the customer towards his toolmaker. **Figure 1** illustrates the increasing integration of the toolmaker into the customer’s processes as the portfolio of offered services expands. Starting at the core product, the tool, each layer adds another service.

While moving outward in the diagram the degree of connection to the core product decreases, meaning that vertical integration into the customer’s processes increases.

The challenge for achieving the optimal added value for both sides is to adequately configure the industrial product-service-system with respect to the service portfolio as well as the technology to enable the service provision. Furthermore offering industrial product-service-systems and making money with them is an issue, which cannot just be carried out on the level of operations. As the success of a company is founded in its business model [13–15], the latter needs to be re-designed to align strategic and operational objectives. Thus offering industrial product-service-systems requires a new business model which addresses the customer’s needs by adding value to his processes generating sources of income along the tool’s entire life-cycle.

3. Survey Findings

As a base for designing industrial product-service-systems respectively a business model encompassing them, a large scale survey addressing both toolmakers and their customers was conducted. The survey was carried out in two parts, starting with the customers and ending with the toolmakers themselves. In total 278 companies in relevant economies all over the world participated in the survey. The outcome of the survey was on the one hand an evaluation of tool-related services by both toolmakers

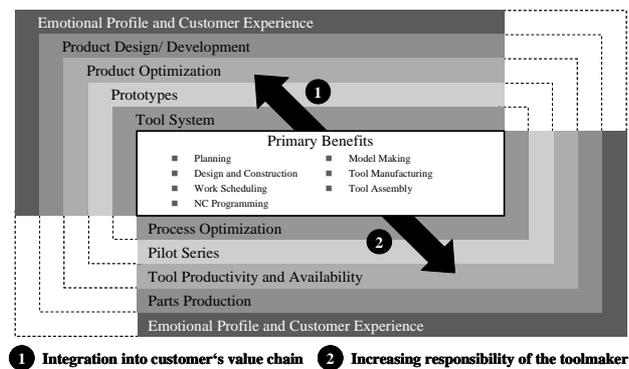


Figure 1. Extended product-services within the TIPSS Business Model

and parts producers as well as a global footprint of toolmakers regarding the provision of these services. The findings referring to the latter are illustrated in the following. The global footprint describes the current structure of the tooling industry regarding four aspects of services provision on a global level:

- 1) Global customers – Are toolmakers taking advantage of globalized markets?
- 2) Local on-site presence – How do toolmakers provide services on a global level?
- 3) Global partnerships – Do toolmakers cooperate to tackle challenges in teams?
- 4) Global sourcing – Are toolmakers taking advantage of globalized supply markets?

In the following the results of the survey reflecting each of the four dimensions are elaborated.

3.1 Global Customers

The first part of the global footprint investigates to which degree toolmakers currently take advantage of globalization by entering new markets to sell their tools. **Figure 2** depicts the structure of the toolmakers’ markets in each region.

It can be seen that North American and Western European toolmakers still have a very strong focus on their own region. The regions China/South East Asia, and to a



Figure 2. Regions to which toolmakers deliver tools

lesser extent Eastern Europe, have a higher percentage of export to other regions. This shows on the one side, that North America and Western Europe are currently still target markets when it comes to parts production. On the other side it also shows that toolmakers in China/South East Asia and Eastern Europe are using the globalization of markets more consequently for selling their tools.

The customer’s point of view is given in **Figure 3**. The illustration shows the ratio of global vs. local purchasing of companies within the different regions. Parts producing companies were asked to rank the top four countries from which they purchase tools. It can be seen that companies in Western Europe and China/South East Asia frequently purchase tools from toolmakers within their own region.

Figure 4 illustrates reasons why parts producing companies are hesitant to buy tools outside their own region:

Customers were asked to rank the importance of several disadvantages they perceive when buying tools from toolmakers in other regions of the world on a one-to-seven scale, seven being the most severe disadvantage.

The evaluation shows, that a lack of services was ranked just after quality issues and delivery time, clearly implicating the importance for a toolmaker to be able to

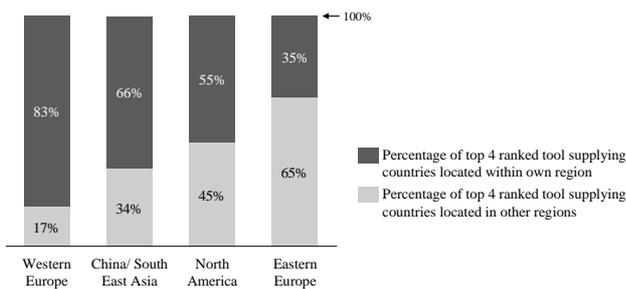


Figure 3. Local vs. global purchasing of tools

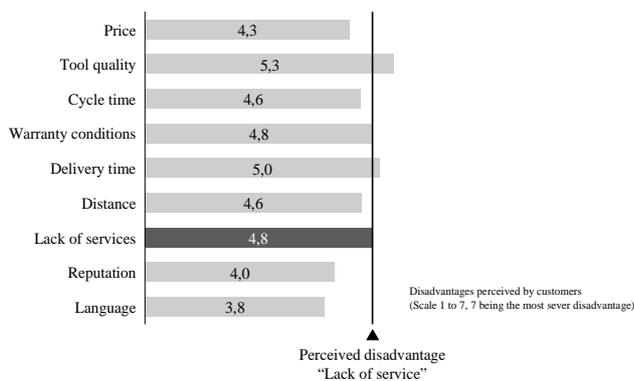


Figure 4. Disadvantages perceived by customers when purchasing tools on a global level

deliver services on a global level.

3.2 Local on-Site Presence

To draw a picture of toolmakers’ on-site presence, parts producer were asked to estimate the percentage of maintenance work that was conducted by their toolmaker at their production site. **Figure 5** shows that a customer’s toolmaker only performs tool related services locally at the customer’s production site in rare cases.

This either means that tools are shipped back to the toolmaker for maintenance or that the customer performs maintenance with his own capacities. **Figure 6** proves that indeed a large part of the required maintenance work is performed by the customers themselves. Three quarters of the customers state that they conduct more than 50 percent of the maintenance with their own capacities.

3.3 Global Partnerships

The third perspective of the global footprint investigates partnerships and other relationships between toolmakers in terms of vertical or horizontal integration into each other’s processes. Toolmakers were asked whether or not they do have any partnerships regarding the provision of services.

Figure 7 shows that a large part of the toolmakers, especially in China/South East Asia, is currently not cooperating with other toolmakers for improving service provision (left). The right side of the figure shows the reasons why toolmakers choose not to cooperate. It sticks out that while North American and Western European toolmakers are worried about the protection of their know-how, Chinese/South East Asian toolmakers simply

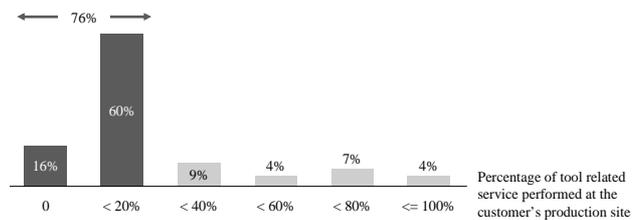


Figure 5. On-site service provision (customer response)

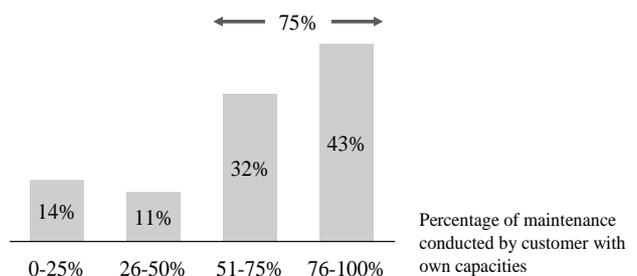


Figure 6. Maintenance service performed by customer

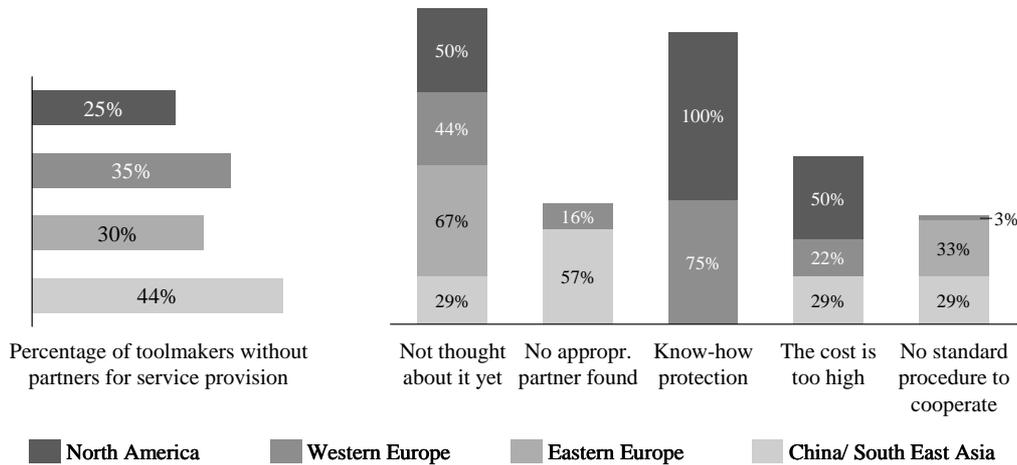


Figure 7. Percentage of toolmakers without service partners (left), reasons for not having service partners (right)

have trouble finding appropriate partners.

3.4 Global Sourcing

The last perspective of the global footprint focuses on the ability of the toolmaker to use globalized markets for sourcing. Figure 8 lists for each region, which part of the value chain is externalized to the global markets. It can be seen that standard tool parts are the largest part of global sourcing. It seems that while Eastern European and Chinese/South East Asian Toolmakers have a stronger focus on selling their tools in other regions than their Northern American and Western European counterparts, they also go further when it comes to opening up their value chain to suppliers from other regions. Furthermore the graphic shows that while standard tool parts are commonly sourced globally, services are still mostly procured locally.

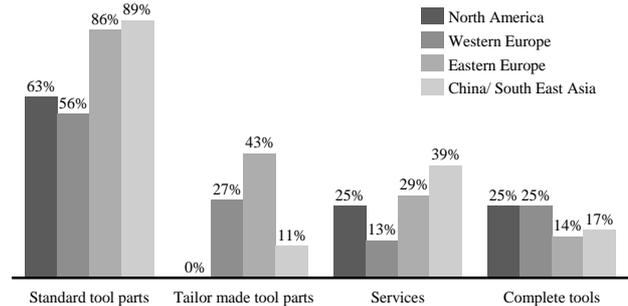


Figure 8. Parts purchased by toolmakers in foreign countries by region

Toolmakers were asked to list advantages and disadvantages they perceive when sourcing globally (Figure 9). While North American, Western and Eastern European toolmakers mostly see an advantage in price, Chinese/South East Asian toolmakers source globally because of quality, reliability, reputation, warranty conditions and, surprisingly, delivery time.

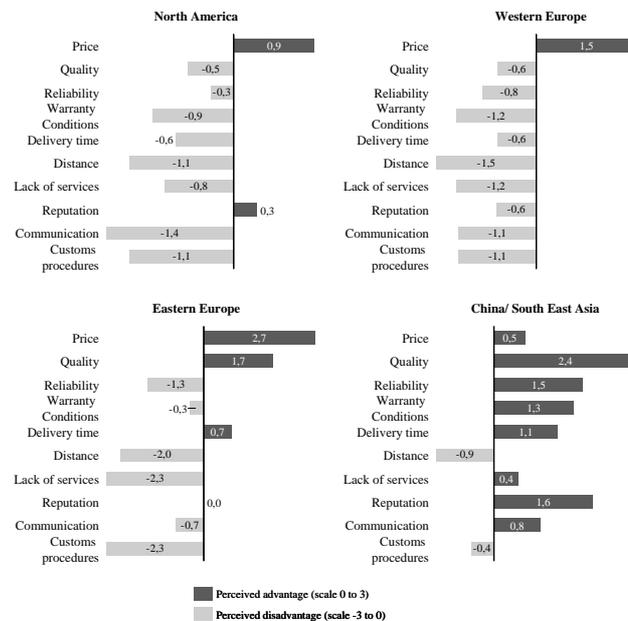


Figure 9. Advantages and disadvantages of global sourcing perceived by toolmakers

services are currently still on a very low level in all regions of the world. In general the results show, that cooperation among toolmakers is still not common and their ability to deliver tool related services on a global level is not sufficient for the current demand for such services.

The results show that in order to be able to offer IPS², toolmakers have to adapt new business models, which focus on four major topics:

- 1) Service provision
- 2) Cooperation with partners
- 3) Customer integration
- 4) Strategies for identifying relevant customer needs

Currently each of these four topics is being addressed insufficiently by toolmakers on the whole. Especially smaller toolmakers that do not have the capacities to offer adequate services on a global level will have to adjust their business models accordingly. Only through close cooperation with other toolmakers as well as their customers will they be able to strengthen their position in the vast competition of the globalized markets.

The development of an appropriate business model for toolmakers is currently being addressed within the FP7 project TIPSS. Further information on the project as well as the complete evaluation of the TIPSS toolmaking survey can be found on the project's website (www.tipss-fp7.eu).

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