

Extended Multi-Customer Supplier Parks in the Automotive Industry

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Abstract

One great challenge for OEMs is to manage the complex supply processes. In order to reduce this complexity, they could integrate large suppliers into so-called Automotive Supplier Parks. In the end, large suppliers would have many small one-to-one plants in Supplier Parks with low economies of scale and high costs. This paper illustrates the key problems of traditional Supplier Parks and presents a new solution: the concept of Extended Multi-Customer Supplier Parks (MCSP+). Requirements, logistic processes and structures will be explained. Furthermore, the paper will present an approach to integrate suppliers in an MCSP+ that are not located in a Supplier Park.

Keywords:

Logistics, Integration, Supplier Parks

1 INTRODUCTION

Central and Eastern Europe (CEE) play a leading part in the development of the automotive industry, being one of the fastest growing manufacturing regions where more than 3,000,000 vehicles will be produced by local plants in 2008 [1]. This setting up of new structures opens up the opportunity to build innovative supply structures that cannot be implemented in Western Europe any more on account of the existing and historically linked production structures [2]. As a rule, production plant structures which have already been implemented and have been proceeding with high sums of investment and long-term contracts can only be altered with great difficulties: the service life of manufacturing plants that cover several decades is nothing extraordinary.

Especially over the last few years the establishment of suppliers in the immediate proximity of the original equipment manufacturer (OEM) plant or directly within a Supplier Park have been implemented by the car manufacturers on account of structural measures. This action had to be taken in order to meet the challenges of the logistics because of the out-sourcing of modules and systems on the suppliers paired with a Just-in-Time (JIT)/Just-in-Sequence (JIS) delivery [3]. Particularly on account of the proximity to the OEM, an improvement of reaction time, of the production speed passing through duration, of the delivery performance as well as a reduction of stock of finished products will be achieved [4]. Scientific research, however, shows that Supplier Park and related structures are more effective in comparison with spatially divided structures of suppliers around an OEM assembly plant [3-4].

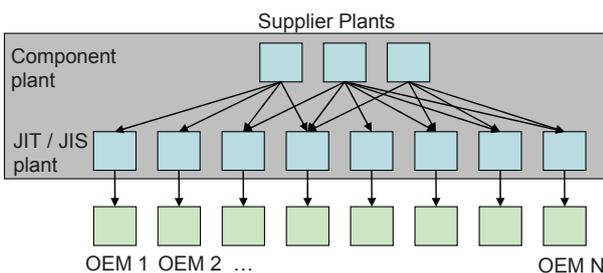


Figure 1: Production Structure of a Supplier.

Apart from the distinctive advantages, the building and operation of the JIT/JIS plants, tailored to customers' personal requirements, also causes a great number of challenges for the supplier. The greatest problems are the uncertainty related to the future delivery of quantities, because of the increasingly difficult process of prognostication, and the non-contractually guaranteed quantities, as well as the missing critical volume for the economically maximum operation of the JIT/JIS plants [5-7]. The plants are built with the least possible investment in order to minimise the risk factor and they mainly carry out sequential operations and low-key value production. Undesired complex production networks from several locations, consisting of component plants and numerous mini-plants are the subsequent result (Figure 1).

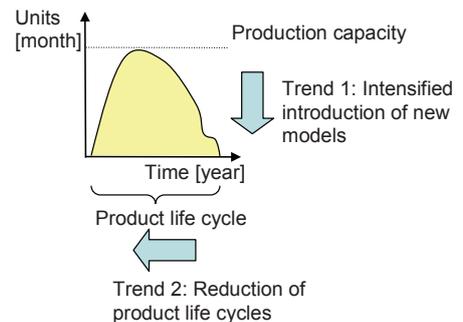


Figure 2 Trends concerning JIT/JIS plants.

The strategy to build JIT/JIS plants within an availability-driven production strategy, where the actual production capacity must be adjusted to the merely temporary demanded highest amount, in order to satisfy the high demands of the clients with respect of the guaranteed supply, is further worsened by the following trends (Figure 2) [8]:

Trend 1: The intensified introduction of new models continues to make the economic setting up of the JIT/JIS plants more difficult as on the one hand new niche models show small production volume and on the other hand, the sale of volume models thereby decreases in favour of the new models.

Trend 2: The incessant reduction of model life cycles within the car industry makes it increasingly difficult to amortize the completed investments by means of a model cycle.

Especially in the region CEE the spatially split production structure of the supplier causes a negative impact in terms of the logistics costs on the component plants in Western Europe as well as on the JIT/JIS plants in Eastern Europe. Apart from the suppliers' own production structures this also applies to the supply network which can to a great extent be found in the traditional markets of Western Europe [1].

Following aspects can be derived from that: If it is successful to build up a concept in CEE

- which breaks up the complex productions structures of the suppliers consisting of component plants and JIT/JIS plants,
- which clusters more asset production in the CEE and
- which takes advantages of spatially concentrated structures such as Suppliers Parks,

a considerably improved situation can be achieved in contrast to the present structures.

The Extended Multi-Customer Supplier Park (MCSP+), which is more closely described in the paper, is a starting point for a likely solution. The MCSP+ concept is based on the fundamental idea that spatially concentrated structures produce a higher productivity than spread-out compartmentalised structures.

2 EXISTING SUPPLY STRUCTURES

In practice intelligent supply structures have been successful in the European car industry. Apart from the loose establishment in the proximity of an OEM plant without a particular structure, (e.g. in an industrial area), the concepts Supplier Parks and Logistics Centres have been established since the beginning of the 90's [3].

A Supplier Park is a cluster of more than two suppliers located adjacent or close to a final assembly plant. The well-defined area includes buildings as well as infrastructure and is purpose-built in order to serve the assembly plant and the suppliers. An operator provides and maintains the whole Supplier Park. Objectives of parks are cost reductions and service improvements of the procurement logistics as well as protecting business relationships [9-10].

In contrast to the Supplier Park where suppliers themselves carry out low-key asset production activities for their parts, this will be undertaken by a logistics service provider (LSP) with a central infrastructure in a Logistics Centre close to the plant. The delivery of the parts to the assembly line of the OEMs is managed by a LSP catering for both supplier structures.

Numerous logistic success criteria from already established structures can be derived and adapted to the MCSP+ concept despite the different adjustment of OEM-channelled Supplier Parks and Logistics Centres which are in contrast to a spatial concentration of component plants that are in greater distance from the multi-customer-orientated MCSP+ idea: Clustering of inbound product flows in the parks (e.g. VW plant in Emden), clustering of park-internal logistical services, such as storage and sequential operations (e.g. GM in Ruesselsheim), central IT-systems for managing the logistics (e.g. VW in Hannover), clustering of the outbound product-flows.

The very readiness only to outsource logistic activities to an external LSP enables the exploitation of inter-related potentials. On account of experiences gathered from

numerous Tier 1 suppliers, with Supplier Parks and Logistics Centres that are both in the proximity of plants, these concepts can be transferred to the MCSP+ idea.

3 MULTI CUSTOMER SUPPLIER PARKS

3.1 The Basic Idea

The basic idea of the MCSP+ is the supply of several OEMs from a region (e.g. within a radius of 400 km) of an intelligent supplier structure where several suppliers with component production are established. The intelligence of the MCSP+ is the increased productivity of the spatially concentrated structure in comparison with the spread-out compartmentalised structures with individual supplier locations, as well as the supply of more OEMs from this structure.

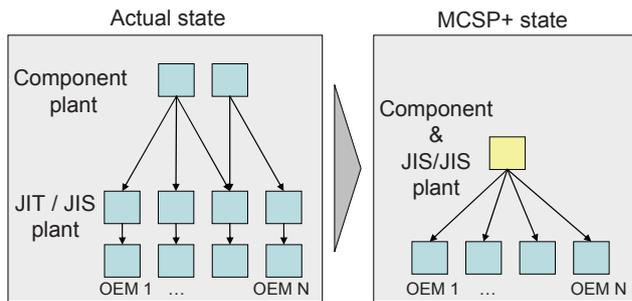


Figure 3: The integration of components and JIT/JIS Plants.

Three effects result from the concept:

- Due to the MCSP+ the construction of JIT/JIS plants is not required any more, the supply of the OEMs is centrally managed through a component JIT/JIS plant within the park (Figure 3).
- Synergy effects can be achieved through the centralisation of production cycles in one plant: improvement of productivity through increased output; flexibility of capacity through more customers; cluster effects through higher product volume (Figure 4).
- Due to the combined establishment of suppliers in a spatially concentrated structure and the transfer of logistic activities to the park synergy effects in the logistics can be opened up by means of increased amounts and clustering's (see Chapter 2).

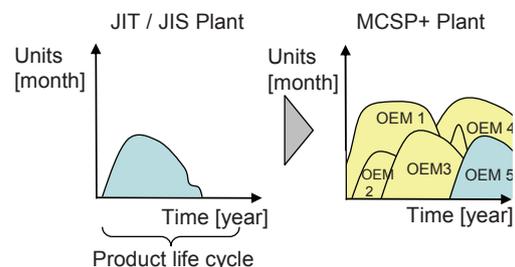


Figure 4: Capacity Equalization and Economies of Scale.

The construction of a MCSP+ entails considerable changes with regard to the plants structures of the suppliers. On account of the non-existence of a great number of new plants within a MCSP+, the realisable concept is mainly present only in regions of growth. Like in CEE where new OEM plants and subsequent suppliers' structures are built on account of Local Sourcing

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