Supplier Capacity Planning at IKEA

Capacity planning from an outside-in perspective

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This article is based on a Master's thesis project performed in the spring 2012. The project was initiated by IKEA of Sweden to be a part of a global roll-out of a new process concerning capacity planning.

Background

During a long time, IKEA has experienced problems with incorrect capacities registered in their systems. There is no standardized way of working with registration and updates of the capacity information today and therefore the information does not reflect the reality. Furthermore, the company does not have a clear picture of how the capacities are allocated. The overview of the capacities is insufficient since there is no standardized way of grouping articles and the capacities are registered in different units of measure, which make them hard to compare. If IKEA has enough capacity available but have allocated it wrongly, there is a possibility to utilize the capacities better and to improve the planning process. Therefore, One Supplier Capacity Process has been initiated.

Purpose

The main purpose with this Master's thesis was to act as a support team to the local trading team when implementing One Supplier Capacity Process in the Lighting Category in Trading Area Greater China. In addition, the tasks were also to evaluate the process and suggest improvements. The tasks were divided into four assignments and were performed for seven selected suppliers:

1. Map and analyze how IKEA is working with capacity planning today (As-Is)
2. Implement the common way of working with One Supplier Capacity Process (To-Be)
3. Evaluate and prove savings
4. Contribute to improve One Supplier Capacity Process

Methodology

The methodology for this thesis has some similarities with action research methodology since analysis and research has been conducted during the implementation and used as a basis for decisions. Interviews have been done with the personnel at IKEA to map the current way of working with capacity planning. The implementation of the process has been performed as embedded case studies in terms of supplier visits. This means that both quantitative and qualitative data have been used in the project.

One Supplier Capacity Process

IKEA has created One Supplier Capacity Process in order to secure that the capacity information is defined, registered and maintained in a standardized way. The goal is to make sure that IKEA can verify and have accurate information about the supplier capacity in the system and also to be able to work in a more proactive way together with the suppliers.

The process will be rolled-out globally and it is based on some definitions that will be introduced to everyone connected to capacity planning at IKEA, see Figure 1.

1. *Resource groups*: Production resource/resources with similar characteristics. The Resource groups are locally defined.
2. *Product groups*: Article/articles with similar characteristics and shares the same Resource group. The Product groups are defined on a global level.
3. *Dedicated Capacity*: The total local capacity need in the resource for the connected Product group/groups.
4. *Allocated Capacity*: Capacity that is allocated to a given Product group within a given Resource group.
5. *Available Expensive Capacity*: The difference between the Dedicated and the Allocated Capacity.

The Dedicated Capacity is allocated between the Product groups based on the average need for each Product group. The bottleneck resource in the system defines the maximum value of the capacity.

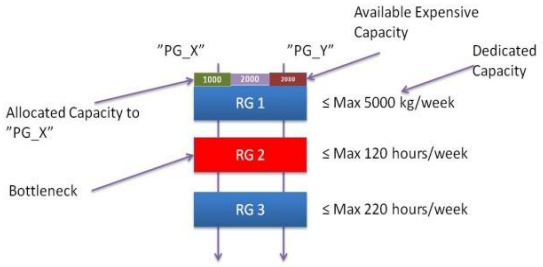

Figure 1: The definitions connected to One Supplier Capacity Process

The information will be registered in the Global Purchasing System according to the following format:

Product_group;Resource_group;Bottleneck_type
E.g. Basisk;Assembly;03

The format is based on the limitations of the system; it has only one field available with limited number of characters for registration of information. The bottleneck type is defined as the driver of the capacity and it is predefined. Examples of bottleneck types are components, raw material and labour.

The One Supplier Capacity Process has a predefined structure that was followed during the implementation, see Figure 2.

Figure 2: The working process for One Supplier Capacity Process

The current way of working – As-Is

It is important to understand how the organization is working today in order to implement the new way of working. When comparing the different views from IKEA of Sweden and the Trading Area it is clear that they perceive some things differently. The capacity planning, the collaboration with suppliers and the current grouping of the products will be further discussed, see Figure 3.

Figure 3: The current way of working with capacity information at IKEA

Capacity planning
The capacity information in the systems is used on a daily basis by both the Need planner and the Trading team. The goal is to have approximately 75% utilization of the resources in the Lighting category. In the current way of working, it is the suppliers that calculate the capacity values. Since there is overcapacity within the category, the suppliers do not see the importance in calculating the capacities based on bottlenecks and throughput times. Instead they use the need and add approximately 20% when calculating the capacity. This does not reflect the reality and is one reason to why the current numbers in the system are misleading. However, the Trading teams are well aware of how the suppliers are calculating their current capacities.

Close collaboration
Close collaboration with the suppliers has been observed and it can cause problems since friendlier relationships make it harder to be critical and unbiased against the suppliers. There are also much knowledge connected to the Trading team and that information is shared to a limited extent within the organization. Since the knowledge about the capacities is limited outside the Trading Area, the information in the system is not seen as reliable by for example the people working at IKEA of Sweden.

Product grouping
The current grouping of the products is done by the suppliers and every supplier is defining them differently. This makes it hard to compare the capacities and it is especially difficult for products sharing matrix. A well performed grouping makes it possible to plan the production in a better way.

The implementation – To-Be

The implementation of One Supplier Capacity Process was evaluated based on observations and the frame of reference.

Participants
The Lighting team has been engaged in the new way of working. The degree of participation within the team has been dependent on the role of the team member. It has been natural for the Supply planners to take more responsibility since this will be a part of their daily work in the continuation.

Material and templates
Much of the material that has been created by the project team for the One Supplier Capacity Process has been used during the implementation. However, some materials were missing when the roll-out started in the Lighting Category in Trading Area Greater China. For example, templates for consumption tables and a tool for calculating capacities were missing. Therefore, additional material had to be created in order to continue the implementation. In a long-term perspective it would be better to create standardized templates in order to secure a common way of working and organizational learning. There have also been guidelines missing throughout the implementation, for example for when to do manual adjustments. It is important to determine some rules for this to secure that all Trading teams calculate their capacities and work in the same way.

Working process
The suggested working process has been followed during the implementation of the project in the Lighting Category and it has worked well. Some of the steps have been combined to get better efficiency in the work. The result of the steps follows.

1. Resource groups

The flows for the Lighting suppliers are quite similar to each other. In general it consists of components, assembly and packaging. Some suppliers have had more Resource groups identified than others since they had for example in-house production. There has also been some simplification done according to the suppliers' wishes and the Supply Planners knowledge.

2. Product groups

The grouping of the products has changed when implementing the new process. Now, there is a global definition of how to do the

grouping and the Supply planners are more involved in the grouping process. The number of groups has increased, see Figure 4. That may implicate some more daily work, but the groups will be more related to the production than before. That will make the capacity information more reliable. However, there is still a risk of interpreting the definition of the Product groups in different ways.

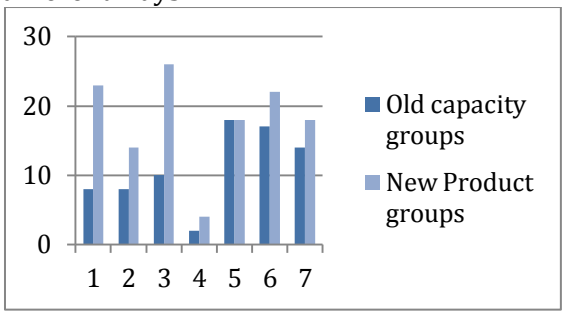

Figure 4: Comparison of the number of old capacity groups and the new Product groups at the seven visited suppliers

3. Bottleneck

One Supplier Capacity Process will reflect the capacity in terms of bottleneck value. It was found that the flows in the Lighting Category can be complex and there might therefore be other bottlenecks than the system bottleneck. In the Lighting business the most common bottlenecks are related to labour since it is located in Assembly and Packaging, see Table 1. Components were also identified as a bottleneck in some cases. However, the components are seldom a problem if the forecasts that are sent to the suppliers are accurate. Finally, there were also bottlenecks found in the machinery at the suppliers with in-house production. This is reasonable since machinery often is expensive and therefore it is important to optimize the utilization of those resources. It can also be difficult to adjust the capacity levels in machinery.

Table 1: The system bottleneck and most common bottleneck at each supplier

Supplier	System bottleneck	Most common bottleneck
Supplier 1	Components (Glass)	Components (Glass)
Supplier 2	Components (Steel)	Components (Steel)
Supplier 3	Paper shade Tooling	Assembly
Supplier 4	Pre-Assembly	Pre-Assembly
Supplier 5	Injection	Injection
Supplier 6	Package	Package
Supplier 7	Assembly 2	Assembly 1

4. Utilization

The utilization in the most common bottlenecks varied between 40% and 80% for the different suppliers. The utilization confirms that there is some overcapacity in the Lighting business today. For three of the suppliers, the utilization is below 70%.

Table 2: Utilization of the most common bottleneck with respect to need at each of the seven visited suppliers

Supplier	Most common bottleneck	Utilization in most common bottleneck
Supplier 1	Components (Glass)	73%
Supplier 2	Components (Steel)	69%
Supplier 3	Assembly	77%
Supplier 4	Pre-Assembly	74%
Supplier 5	Injection	73%
Supplier 6	Package	65%
Supplier 7	Assembly 1	41%

The total amount of registered capacity increased after the implementation of One Supplier Capacity Process. However, it is hard to find a trend between the suppliers. The capacity has increased at some suppliers and decreased at others, see Figure 5. This indicates and confirms that there has not been a common way of registering the capacities before.

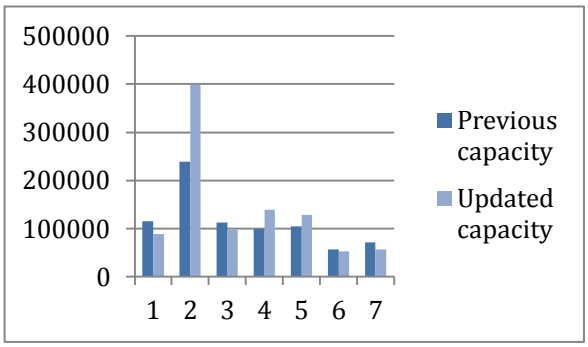

Figure 5: The old capacity values compared to the new at the seven visited suppliers.

Evaluation and savings

One Supplier Capacity Process has been evaluated and savings related to the new way of working has been identified.

Transparency

By implementing One Supplier Capacity Process the figures will be more transparent because it will be clear what the actual capacity is and how it is calculated. It will also be easier to be more critical to the numbers when having an understanding of how they are calculated.

Common way of working
The new process enables a common way of working with capacity planning on a global level at IKEA. The dependence of knowledge from specific persons will be reduced since every Trading Area is forced to work in the same way. The new way of working will also contribute to the education of the suppliers.

Global overview and more proactive work
By introducing the new Product groups and the new format for registering capacity information into the system, it will be easier to compare the information. This will make it possible to reallocate capacity between suppliers and to work more proactively with capacity planning.

Capacity utilization
When having updated figures in the system, it will also be easier to analyse the capacity utilization of the resources. There is a goal set by the category and there have been signs of overcapacity in the category for some time. When having complete and accurate numbers it will be possible to take action based on these and for example reallocate capacities if needed. By improving the utilization, IKEA can also reduce costs.

Critical to capacity
With the new way of registering the capacities in the system, it will also be possible to see the bottleneck type in the system. This makes it possible to understand what is required to increase the capacity at a supplier. Shortages can for example be solved by adding extra labour or doing investments and that can be important to know in a tactical planning perspective.

Increased knowledge at the suppliers
Through implementing One Supplier Capacity Process, it is required to educate the suppliers in some extent. Better knowledge at the suppliers can be beneficial for IKEA since it makes it possible for the suppliers to improve their performance. Some of the suppliers have expressed interest in implementing a working process for capacity planning at their suppliers and that can be beneficial for IKEA.

Suggested improvements

Improvement possibilities have been found when implementing One Supplier Capacity Process, examples will follow.

Explicit guidelines and templates
Since the goal of the process is to have a common way of working it will be important to create global, standardized templates and guidelines. This will force the work in the same direction and make the information as comparable as possible. More guidelines will also make it easier for the Trading teams to work with capacity planning. However, it is not possible to standardize everything since different categories have different characteristics in the production facilities.

Development of allocation tool
It is difficult to calculate optimal allocation values, especially when there are several Product groups sharing the same Resource groups. Neither of the two current possible solutions is optimal and to get more correct and comparable values in the system, the next step will be to develop the tool further. This will contribute to a common way of working since the figures will be calculated in the same way and it will also improve the accuracy of the figures that get registered in the system.

Extra capacity
In the continuation it will also be important to decide on how to handle the extra capacity that IKEA can get in a longer time horizon. This information can be valuable in the tactical capacity planning. The recommendation is to create some general guidelines for how to collect this data from the suppliers. It is also recommended to find a way to handle the additional information that cannot be registered in the system.

Definition of Available Expensive Capacity
Since it is decided by the category to allocate and register all Dedicated Capacity, there is no or very little Available Expensive Capacity in the Lighting category. However, there is at the same time overcapacity within the category. Therefore it might be misleading to say that there is almost no Available Expensive Capacity when there

actually is unutilized capacity in the resources. To highlight the problematic, it is therefore recommended to redefine the Available Expensive Capacity or add an extra definition.

Conclusion

Most of the literature concerned with capacity planning is from an inside-out perspective which means that the focus is to plan the own production and production resources. From IKEA's point of view this is not very useful since they do not have any production of their own and the goal is rather to plan the capacity that they have at their suppliers. In other words they are working with capacity planning from an outside-in perspective. However, ideas and concepts from the regular capacity planning can be used and applied when working with capacity planning from an outside-in perspective. One Supplier Capacity Process captures many of the important parts of capacity planning and is a good theoretical base to build the capacity planning upon. To be able to take full advantage of the benefits from the process, to implement the process fully and to establish a common way of working the recommendation to IKEA is to make sure that there are complete guidelines and materials as well as a complete tool for calculating capacities. Otherwise there will be a risk of having different ways of defining, registering and maintaining the capacity information. It will be important to consider how to handle the overcapacities in the category in the continuation. It can be discussed if it is necessary to have the extra capacity. It creates flexibility but at the same time it constitutes an extra cost for the company. For the planned expansion in Trading Area Greater China this can be a good opportunity. In that case it is important that IKEA is aware of and that they take advantage of the extra capacity.

One Supplier Capacity Process has introduced a new, common language and working procedure with capacity planning at IKEA. It will be a continuous work to implement the process and improving it, but there are at the same time many savings derived from the process. The concept and theory has also contributed to the field of research regarding capacity and capacity planning by adding an outside-in perspective. Studies of how planning from an outside-in perspective affects suppliers and the collaboration between companies and suppliers are suggested as an interesting area for further research.