

# STREAMLINING PRODUCTION AND LOGISTICS TO MARKET NEEDS

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Companies are found to have a history that has had a strong impact to their situation of today. As

- markets,
- technologies,
- customers,
- suppliers as well as
- competitors

are moving continuously and fast, it is helpful to evaluate the situation from time to time and identify needs for changes and for directions. Questions to be asked are: How do

- Structure of the Production
- Used Technology
- In-Site Production Depth
- Production Planning and Control
- Logistics
- Organization

meet today's customers' needs?

Recent Projects indicate that these very basic questions need to be asked regularly. Savings of more than 20% as well as a much better response to customer's needs and expectations could be found in the majority of the projects.

The procedure itself is as straightforward as the objective itself, the major aspects are investigated by applying procedures, checks as well as Kaizen-type approaches as follows (see figure 1):

- Identify/recognize customers' needs
- Evaluate structure, strengths and weaknesses of the existing production
- Evaluate structure, strengths and weaknesses of the existing Logistics
- Identify value adding and wasting jobs
- Check organization as well as management
- Evaluate quality needs

and derive action plans on the major misfits/deficits.

Only seldom this is done by routine, but in general an occurring major problem is the driver of such an action. Frequent problems that cause a company to look into these holistic questions are problems with the

- Quality
- Productivity/Competitiveness
- Ability to deliver

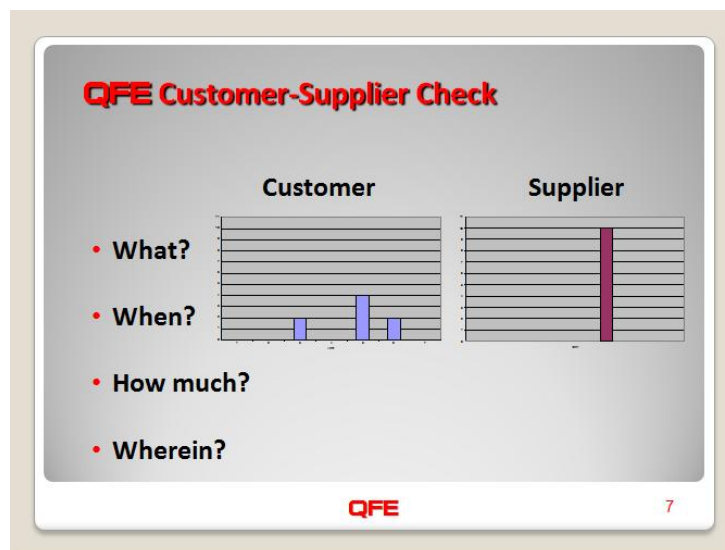
or just by the need to install another production site for the next product.



**Figure 1: QFE Streamlining Procedure**

Depending on the reason/problem that induced the project, the emphasis may vary, and not all aspects will be investigated in each project necessarily or in the same detail. Some samples are shown in the following sections.

A Customer/Supplier Check is analyzing the harmony of the customers' intake and the suppliers' output (figure 2).



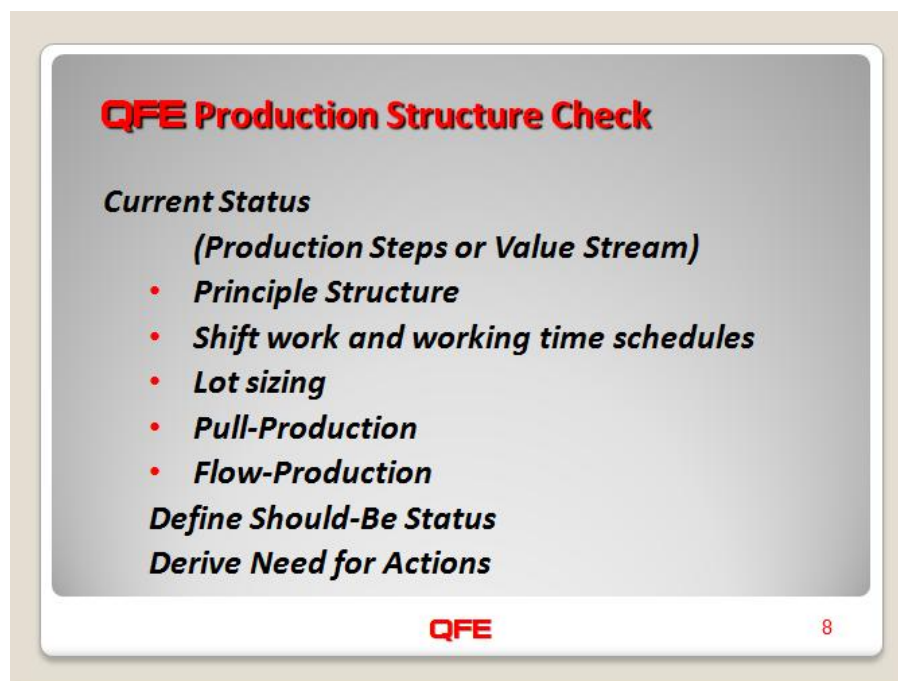
**Figure 2: Customer/Supplier Check**

In this early phase it is urgent to understand the scheme of the customers' production that is causing the demand and later to try to meet this scheme with the supplier's production. In the example of figure 2 this is done poorly. As a discrete demand is being satisfied by stocked parts that are being restocked by the supplier's production in a specific lot size from time to time.

Questions to be asked are:

- Is the recognized customers' demand the true demand of the market/assembly or just the result of improper logistical, production planning or purchasing solution?
- Is the lot size of the supplier the result of hard facts or just of wrong assumptions/settings?
- Can EPEI (Each Part Every Interval) be achieved?
- Can SMED (Single Minute Exchange of Dice) be achieved?
- Is the technology appropriate?
- Can Kanban-type control solution be used?
- Can the warehouse, delivery control, receipt procedure, repacking, be avoided?
- Can milk-run-type solutions be applied?
- Is the vehicle fully loaded?

In a Production Check the features of the existing structures are being identified and gaps to meet customers' needs are being identified (Figure 3).



**Figure 3: Check Suitability of the Structure of the Production**

Of special interest is the principle itself. If the customer is operating a mixed-model assembly line then any solution by the supplier allowing the same mix will be preferable to structures that e.g. allow only production in batches. The outcome of such an indicated mismatch can easily be seen in a value stream map and is one of several typical causes of high "excess" stocks.

This is supported by several of QFE's checklists. Table 1 shows an excerpt of the questionnaire for the working places. Included are hints for promising actions, in case improvement is needed.

**Table 1: Questionnaire for the working place (excerpt)**

Item	Y	N	Comment	Measures
Standardized containers	<input type="radio"/>	<input type="radio"/>		Standardisation
Colour coded containers	<input type="radio"/>	<input type="radio"/>		5S
Clearly arranged tools	<input type="radio"/>	<input type="radio"/>		5S
Container for kanban cards	<input type="radio"/>	<input type="radio"/>		Kanban
High availability of and universality of devices	<input type="radio"/>	<input type="radio"/>		Technology
Harmonized rhythm	<input type="radio"/>	<input type="radio"/>		One Piece Flow
Colour codings on tools	<input type="radio"/>	<input type="radio"/>		5S
Devices that ..				
... avoid to start to process a damaged part	<input type="radio"/>	<input type="radio"/>		Poka Yoke
... avoid to allow to insert a wrong part	<input type="radio"/>	<input type="radio"/>		Poka Yoke

The logistics ability and performance is investigated in another dedicated test. Of special interest is the range of coverage as this is directly causing the frequency of the resupplying on one side versus drawbacks in the optimization of the working place as well as higher inventories on the other side. The procedure includes to

- Show Material Flows
- List Vehicles and Containers/Boxes
- Show Flows (and Back Flows of the Containers)
- Show Reach of the Containers/Boxes (and/or resupplying frequency)
- Show Schedule of Supplying and Shipping

Efficiency of the use of the workforce, machinery as well as material is investigated in the key issue: the Productivity Check. This step is identifying the most urgent hints to act and furnishing the best possible insight to evaluate, guide and streamline the activities (Table 2).

**Table 2: Classification of Value and Resources Wasting Activities**

	Value Creating	Obvious Waste	Hided Waste
Manpower	Assemble Operate	Wait Rework	Set Up, Quality Control, Deletable Tasks
Machine	Cutting, Coating, etc.	Idle Rework	Set Up, Maintenance Wrong Technology Unsuitable Process
Material	One Piece Flow	Scrap Stock	Transport

In a first step value adding tasks are being identified. This is done with respect to manpower, machinery as well as material. These are then investigated in order to increase productivity by minimizing the utilizations of resources (Table 3).

**Table 3: Efficiency approaches with respect to the associated categories of activities**

	<b>Value Creating</b>	<b>Obvious Waste</b>	<b>Hidden Waste</b>
<b>Manpower</b>	<b>Optimize</b>	<b>Eliminate</b>	<b>Eliminate or reduce</b>
<b>Machine</b>	<b>Optimize</b>	<b>Eliminate</b>	<b>Eliminate or reduce</b>
<b>Material</b>	<b>Optimize</b>	<b>Eliminate</b>	<b>Eliminate or reduce</b>

In a second step obvious waste (with respect to all resources) is identified and measures are looked for to eliminate them. As this category is characterized by waiting time or idleness, this is indeed obvious and can easily be recognized. Then measures are being sought to eliminate these kinds of waste. A dedication to the idea of value analysis and value engineering is very helpful for this step.

In a third step (planned) tasks that do not add value are being identified, again with respect to man, equipment and material. This is probably the most challenging part of the analyses, as action can be observed, but engineering knowledge and insight is needed to recognize the limited or even missing value of the use of the resources. Those jobs are sought to be eliminated or at least minimized. Spaghetti diagrams as well as material flows drawn into the layouts are very helpful for this part.

In the QFE Quality Check the companies' abilities to meet customers' expectations in terms of quality are investigated. This involves

- Quality Management
- Statistical Process Control
- Audits
- Qualification of the Workforce
- Testing Equipment

and is of course supported by a set of questionnaires.

In a final check the role and the efficiency of management and organization are being investigated. Participation, employees' development as well as group structures seem to be a European add-on to the ideas of lean management. In countries and production sites with a highly skilled and educated workforce this makes sense.

- Fast Recognition of the Problem and Clearance of the Fault
- Clear Tasks and Roles
- Safety and Environmental Consciousness
- Visual Management
- 5S
- Standardized Methods und Processes
- Stable Processes/Products und Preventive Quality Management

Major outcomes are the evaluation in how far

- Production Structure
- Production Logistics
- Value Adding Performance
- Quality Performance
- Organization und Leadership

are meeting the demands. Gaps are being identified, priorities set and the most urgent action items are being listed. The outcome is documented in

- immediate
- intermediate and
- long term
- action plans.

Experiences indicate the need for challenging the basic settings. Huge savings could be identified in cases where the basic settings of the company did not fit to the demands of the market. The result is even better if the product itself can be optimized by applying Value Analysis/Value Engineering approaches.