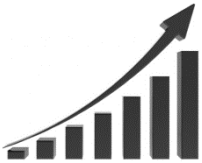
SELECTED EXCERPTS FROM THE BOOK "LEAN IN ACTION"

01.11. THE LION COMPANY HAS TWO TECHNICAL OBJECTIVES

According to a so-called Zoological interpretation of the Life Cycle Theory, the hawk-companies circle over the market at the stages of product intro and product growth. When the market is saturated, it is taken over by lion-companies. Then, when the product is at the end of its life cycle, there are the companies-jackals which glean the remains of the carcass of the market.



The lion-company has two intelligent technical tasks to resolve. The first of these is to create a construction which is suitable for regular production, which is designed in such a way as to use a small number of materials, components and assembly units. The second task of the lion-company is to create a technology consisting of a small number of optimised, checked, and stabilised processes and operations. In fact, the dominant advantage of the lion is its powerful technical resource, its designers, constructors, technologists, testers, and other technical personnel who are capable to create a project for regular production with optimised, stabilised, and high value added processes. The lion-company, unlike the hawk-company, focuses on organisational and technical solutions related to product construction and to production technologie. The hawk-company quickly develops and produces a new product and puts it on the market, without much thought for expenses and technical improvements. How does a lion-company achieve price twice, or twenty times, or two hundred times lower than a hawk-company? The lion-company achieves this much lower price because it has the technical resource to excel in design and technology. The lion-company creates intelligent product constructions suited to real production, and which are designed for implementation with a small number of materials and components, and a small number of processes and operations. In the case of lion-companies, it isn't the skis riding the skier but the skier riding the skis. The allusion to skiing (understand "production technologies") is very important because in many companies technology is not mastered and when the production results are good or not, it is not even known why it happened.

EXCERPT FROM CHAPTER 01. KEY IDEAS OF LEAN

02.14. BARRIERS TO COMPLIANCE WITH TECHNOLOGICAL COST LIMITS

There are reasons why technological cost limits are burdened with falsifications. One reason is overstocking on the pretext that a given material is in deficit or that delay is expected on the part of the supplier. Today we have the material, tomorrow we don't. Let's buy now, and let's buy as much as we can. Any reader of this book would have a wasteful manner of beer drinking if they knew there were 20 beers in the fridge. It would be different if there were only two beers. Another reason may be an unreported dependence on the length of a given series. In the case of short series (not always), the relative cost rates are higher. The things get totally distorted when rework operations are admissible. In the case of admissible rework, we cannot specify correct technological cost limits.

There is a risk contained within the term "Technologically admissible scrap rate". Let's assume admissible scrap to be 5% and real scrap to be 6%. We should say, "We have 6% scrap, one percentage point above the technologically admissible limit of 5%". This is a very long sentence, and this is why we refer to 1% scrap. But this is untrue, the scrap is 6%. If we have reduced scrap to 2%, we should say, "We have 2% scrap, three percentage points lower than the technologically admissible limit of 5%". This sentence is also boringly long. So we say we have no production scrap, which is also not true because we have 2% scrap. If we assume that we are working with a pre-affirmed limit (norm) for technologically admissible scrap, this means that we have accepted excessive costs in terms not only of materials and blanks but also of all other types of production resources. We see a paradox in industries which manufacture to order. An order is for 100 units. We start with 110 blanks because we have a 10% scrap limit. However, we're performing better and producing 105 finished products rather than 100. Order is for 100. What do we do with the extra five? They go into scrap because there's no customer for them. So if real scrap falls below the normal scrap, we make a loss. We have to discard a usable product. That's ridiculous, isn't it!

Another thing that may prevent us from conforming with the technological cost limits is reporting by day, shift, or by batch, not by executed orders. When reporting is based on working time or on executed series, we can always transfer resources from one period to another (or from one series to another), and, in this way, all the violations of technological cost limits remain unnoticed.

The greatest scourge are punitive models for reporting and paying of labour. It is natural for a people, if he is afraid of being punished, to conceal certain reserves in order to prevent default and thus avoid punishment. The Lean philosophy is not compatible with a punitive model for reporting and payment.

03.04. WE HAVE OUR OWN BULGARIAN MUDA

This is something beyond the bounds of Japanese and American imagination!

They have no idea about what kind of Muda we have and nurture in Bulgaria.

These specific Muda are mainly due to the inherited circumstances in Bulgaria and everything related to them.

We have unusable production and logistical areas and buildings, unnecessary materials, technological devices and tools, unfit machines and installations, etc.

We have a large variety abnormal volume of additional and auxiliary processes and operations due to a lack of control over the core production processes.

We have complicated and expensive to maintaincontrol systems, as well as correction processes and operations embedded in the technology itself because we do not know how to achieve the product quality from the first time.

We have inexplicably long preparation and finishing times because of weak or missing technological assurance. Next, we will see an example of a factory in which the auxiliary times are ten or more times longer than the main times.

We have a sea of unnecessary rules, standards, documents, data and records, partly due to the mechanical implementation of ISO 9001 requirements but much greater than the inability or reluctance to create a simple but efficient management system. We have incompetent management staff and illiterate performers, an increasingly widespread phenomenon in large companies.

This can lead to a multiplier effect of illiteracy and powerlessness at the high levels of the management pyramid. We have pointless subordination and inefficient control, especially if foreign rationalist management models are overcooked.

The last three Muda exist all over the world to a greater extent than in Bulgaria. But we have them too. The fact that they exist anywhere doesn't excuse us.

The Muda listed in the previous paragraphs are essentially Muri of inadequate company management systems. You won't be able to overcome Muda in production if the management system itself has given rise to them. The entire arsenal of Lean Production tools can be powerless against such types of Muda.

Here the tools of Industrial Engineering and the Organisational Design of Company Management Systems will be much more useful but we need to know them well, and have the desire, will and insistence to implement them.

04.15. FIRST TIPS TO CREATING A VSM

Where do we start? We suspect that in a given product line there are large or chronic losses, and we will probably start from there. If some essential elements of the production are changed, then we should have to compile a new pictogram. That's the first bit of advice.

The second advice is important. It was emphasised in Chapter 02 relating to production description and measurement that when we collect data on operations and processes, we start from scratch, as if no one before us has described these operations and processes. We don't trust any previous data that's available at the company. Even if the data was correct at the time of collection, it may have become obsolete over time, or there may have been a strong subjective factor in generating this data, and it may have been deliberately distorted.

We have to pay particular attention to production capacities! We have seen a number of reasons for concealing the real capacities.

Attention to technological cost limits! There are reasons why on resources spending limits can't always be truste. Here, the principle is that we believe only that data and information which we have personally obtained, whether through observations and measurements or otherwise.

Here more pieces of advice. When several people work together, then we need to adopt a unified system of pictograms. We need to have someone, let's call him the editor-in-chief, to summarise and assemble the results.

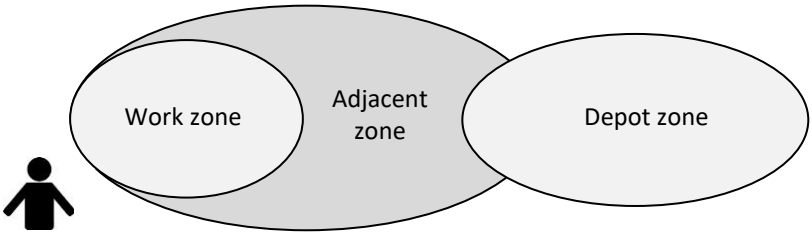
We collect data as the Japanese say, "Go to Gemba and get them, they are there". Gemba is "in the workshop". Bulgarians say, "See it with your eyes, touch it with your hand". Data is not collected from a desk by digging through computers and dusty folders. We have to go to the shop floor and stand next to the worker. We search and collect the data personally, "on-site".

We describe the processes starting from the shipment to the customer, back to the ordering of materials to supplier. The rule is not explicit but if the books recommend it, it may make sense. Anyway, this is the advice, and we accept it, but with the condition that this advise applies more to inverse tree processes, such as in the assembly industries.

In the case of linear types of processes (processing industries) and branching tree processes (manufacturing industries), I do not see any serious reason why the flow cannot be described in the opposite direction – from input to output.

05.01. TWO DEFINITIONS

I'll begin with two important working definitions. No definition of "workplace" is needed, everyone is aware of what "workplace" means. But any workplace, in the aspect of the 5S System, can be conditionally divided into three zones.



A work zone is the part of the workplace in which the worker does most of the work. He sees the things he needs and reaches them without moving, or almost without moving. In the work zone of the workplace are the things necessary for the work that is currently being done. The adjacent zone is located in close proximity to the work zone of the workplace. There is also a depot zone. What is the difference between a warehouse and a depot? When you get something from the warehouse, you don't return the remainder unless it isn't fit for future use. From the depot, you take something, use it, and return it. Of course, the most rarely used things are stored in the depot zone of the workplace.

What has been said here seems to be especially true of industrial workplaces, whether the worker is working sitting, standing, or in another body posture.

There are stationary workplaces, and there are mobile workplaces. A bus or tractor cab is the stationary workplace of the bus driver or tractor driver.

The operating table is the stationary workplace of the surgical team. The mobile workplace of the health and safety inspector is the facilities he's inspecting.

The mobile workplace of the security guard is the guarded objects and areas.

There are simple and complex workplaces. Simple workplaces are these of a cashier in a shop, an installer in a factory, or a receptionist in a hotel. A complex workplace is that of a waiter – with tables, a bar, and a counter, that he has to serve. A chef's complex workplace is the entire kitchen with all the stoves and trays in it, including all the food stores, refrigerators and freezers. A housewife's workplace is complex but also mobile depending on what kind of work she does – cooking, washing dishes, doing the laundry, dusting, or drying laundry...

06.07. DIFFERENT NUMBER OF TECHNOLOGICAL DEVICES IN LONG AND SHORT SERIES

Number of orders	Number of collets
20	50
50	20
100	10

For a short series, a smaller number of technological devices are used. We see a gadget called a Collet. The customer's order is for 1,000 units. We can cut this customer order into 20 production orders of 50, or 50 orders of 20, or 100 orders of 10. We can see how many collets there are in the three cases. In the first case – 50 collets, in the second – 20 collets, and in the third – only 10 collets.

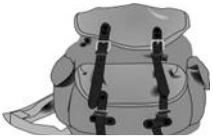
Number of lots	Length of lot (m)	Number of balises
1	5000	500
5	1000	100
10	500	50

We will consider a similar case with a large and small number of signal balises when repairing a 5,000 metres road section, broken down into shorter or longer repair lots.

The balises are located 10 metres apart, regardless of the length of the lot. If the repair is done at one time, the lot is as long as the road section, i.e., 5,000 metres, 500 signal balises are needed. If the repair is done in 5 lots of 1,000 metres, 100 signal balises are needed. If the repair is done in 10 lots of 500 metres, only 50 balises are needed.

Balises are not cheap. Let us suppose that there may be other considerations regarding the economic efficiency or another kind of appropriateness to make repairs at once all over the road section. If there's anyone who can squander money without taking it out of their own pocket, everything looks almost fine.

07.23. THE TOURIST BACKPACK TASK



	Five orders awarded for production, but it does not have the capacity to take them all				
	Order 1	Order 2	Order 3	Order 4	Order 5
Revenue per order	P1	P2	P3	P4	P5
Readjustment time	T1	T2	T3	T4	T5
Order efficiency vs. readjustment time	P1 / T1	P2 / T2	P3 / T3	P4 / T4	P5 / T5

Let's take a look at the interesting task for the tourist backpack. The volume of the backpack is limited to, say, 80 litres. The things we want to put in the backpack amount to 180 litres. We have to decide which things we can take and which things we have to leave behind. The things we want to take are indivisible things like a sweater or thermos. There's no such thing as a half-sweater or a half-thermos... Yet, our need for things is different, and this need can be valued.

A backpack is a backpack… We are talking about production orders and production capacities. Different orders: 1, 2, 3, 4, and 5. The revenue from an order is P, and the time for readjustment of the equipment for this order is T.

The P/T coefficient characterises order efficiency versus the readjustment time needed for it. We will try to fill the backpack (i.e., to put into production) only such orders where the P/T ratio is high.

Given this assumption, certain low- efficient orders are eliminated, despite the risk of losing their customers. Only the higher-efficient orders remain. Orders that go into production are completed to a high level of quality and on time, to the satisfaction of the customers.

The orders are indivisible – we can only complete entire orders, not parts of orders. Since the orders are indivisible, it is quite possible that part of our production capacity will remain idle.

We need to try to maximise our profits through a rational scheme of change and readjustment of the equipment. I am absolutely convinced that the planning departments of Bulgarian companies (and certainly not only them) do not have the software to solve this undoubtedly useful task of order prioritisation.

08.13.11. FIRST STEPS AND RISKS IN THE IMPLEMENTATION OF TPM

Pilot units and equipment are selected as are criteria for centred maintenance. It is assessed whether the maintenance unit is appropriately positioned in the organisational chart. Conditions are created for autonomous maintenance. The most important of these are the freedom of actions, the first level maintenance instructions, and the change in maintenance planning mechanism.

There are plenty of risks! Let's take a look at them one by one. The greatest risk lies in the unsuitable choice of pilot units and/or equipment. I will say here that I do not know what is suitable or unsuitable if there are no clear and unambiguous criteria as to what this choice is aimed at. Suitability of choice is the responsibility of company management.

In a lot of companies, the logic is to start where things are a cause for concern. For example, units with insufficient capacity, equipment in bottlenecks, the most expensive equipment and equipment with the slowest rate of return, as well as unique equipment. In other companies, the logic is to start where there is a high level of readiness – where there is previous experience or the necessary competence and/or where things are expected to happen without particularly high human resistance. The thought process in some companies is – let's focus our TPM on equipment in the initial stages of the production process, because if the equipment there is causing faults, in the next stages of the process there will be entire chains of faults. Naturally, the selection of units and/or equipment for pilot work on the implementation of the TPM can be done on the basis of other arguments.

In large companies especially, when the management hear and like the notion of TPM, they say: "We'll implement TPM, but not partially, we'll implement it completely. But if it's going to take more than three months to implement it, we may as well not bother at all". We'll hear that reasoning. In order to reduce the risk, we need to implement TPM in one unit or for one type of equipment. Once we learn how it works, we'll expand the application. But we'll be walking a well-trodden path with no pitfalls.

Another risk for TPM is not receiving or having weak the white collars support. This is understandable, especially if we have too many white collars.

There may be resistance from the specialised technical personnel. They're afraid that their authority will be undermined. It will take away their role as a demigods who determines the destinies of the company's technical problems.

Unexpected production fires are also a risk, they divert attention from TPM.

09.03. PROTOTYPE "IN JAPANESE"

One well-researched production does not pose the risks of nasty surprises. Let's try to understand the central idea of the so-called "Prototype in Japanese".

When the Japanese make a prototype of a new product (or a sample series, or trial series), they deliberately do so in a problematic production environment in which production factors are pushed almost to the limits of non-conformity.

Materials with very broad tolerance fields are deliberately used. These are suitable materials, but they're on the verge of non-conformity. They deliberately use machines that are about to undergo capital repairs. These are still working machines, but almost to the point of non-conformity. They deliberately use recently recruited workers. The workers are trained but have not yet fully mastered their work and are therefore at risk of making mistakes.

Then, if despite using shoddy materials, worn machines and inexperienced workers, they obtain a suitable prototype of a new product, all the products of regular production will be better than the prototype.

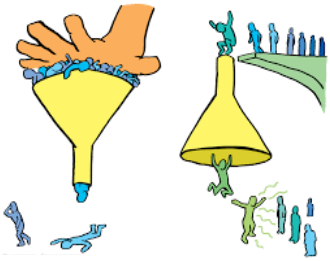
We do the opposite of the Japanese – we look for special materials, we use precision machines, we engage the most experienced technical and operative personnel. Then we are always unpleasantly surprised that in regular production we fail to obtain repeatability and reproducibility, compared to a "successful" prototype of the new product.

The Prototype in Japanese is the forerunner of the idea of variable technology (aka Quasi-Exhaustive Technology), based on been well researched favourable and unfavourable variations and/or combinations of all production factors. From delivery to delivery, the characteristics of the materials change. The physical condition and the technological setting of the equipment change. Workers have different knowledge and skills. Atmospheric conditions change and affect the work environment.

At a given moment, the production factors can combine in a different way, and for each combination, there is a technological variant that is appropriate for this combination. There could have been 30 or more variants of the technology. Today, the production factors are in combination № 16, and the applicable for today technology variant is № 16. So today we're going to use technology № 16.

Here's a summary. If we have studied the production process in advance, we can develop solutions to possible problems in advance.

10.09.07. TO FEEL THE DIFFERENCE EVEN MORE CLEARLY...

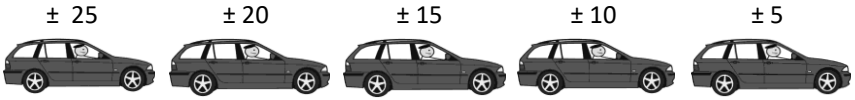


A cursory comparison of the two images gives a vivid explanation of the difference. In the right image, we see a Pull Flow. It may flow at a lower flow rate, but it flows evenly, without tension. On the left image, we see a Push Flow flogged with large quantity of unfinished products. Unfinished products slow down the flow rate and the flow does not flow smoothly.

The image shows something else. On the left we see a Push Flow. The hand with open palm symbolises the pushing mechanism that crushes the production orders. Beneath the funnel on the left, orders are carried out violently and suffer from it. To the right is the Pull Flow. The production orders willingly leap into the funnel and happily jump out of it.

Let me say it again, because it is extremely important – the Push Flow is a source of constant organisational and psychological stress.

WHEN WE DISRUPT OUR OWN STREAM



Here's a motorcade. Due to unforeseen circumstances encountered on the road, if the speed of the first car fluctuates by plus or minus 5 km/h, the second car, in order not to drop behind, varies its speed by plus or minus 10 km/h, then the following cars – by plus or minus 15, by plus or minus 20, by plus or minus 25.

The example reminds us that the greater the number of steps in the process, the more likely it is that the latter operations will become unstable as a result of destabilisation in their previous operations, and especially in the first steps.

The destabilisation effect is strongest and most damaging in sequential-type flow.

The lion-company designs a process with a small number of operations, not only because it is cheaper but also to make the process more stable in its entirety.

The fact that the process is more stable with a smaller number of operations does not necessarily mean that we need to reduce the number of operations. A comparable outcome can also be attained by combining related operations.

11.10. PREREQUISITES FOR IMPOSING JUST-IN-TIME SYSTEM

The Just-in-Time Production and Delivery System was born in the automotive industry. These days, it's expanding quickly into ever-new industries. How and why does JIT race like a white unicorn?

One of the prerequisite for imposing Just-in-Time is the fragmentation and the diversification of the market, which leans increasingly towards the customised individualisation of the products. Globally, there is an irreversible tendency towards Make-to-Stock production, giving way to Make-to-Order and Make-to-Catalogue production. With Make-to-Order productions, some signs are noticeable that they approach in character to Make-to-Catalogue productions. Yes, in the case of the Make-to-Catalogue of certain products, the nomenclature is relatively small when compared to that of the Make-to-Order production of the same or similar products. How much smaller is this nomenclature? It is growing and growing…

A global phenomenon is the constant rising land prices. In the 1950s and 1960s, expensive land prices put a lot of pressure on the Japanese. They could not build single-story factories spread out in width, as is in some other countries in the world. Thus, two concepts emerged in Japan for saving production areas. One was for factories to be designed vertically. The work process is on the floor, intermediate storage and inter-operation transport are located under the floor or on the ceiling.

The important concept for us is Lean Production – with its ideas of irreconcilable struggle with the unfinished product, the stocks, and queues, and all the other types of Muda that uselessly occupy these spaces, which we are always short of.

There is also a premise that automobile transport prices tend to fall, not absolutely but relatively to the price of goods transported. Also, today's forwarding allow grouping and other forms of combining cargo or optimising routes.

A long time ago, we thought that rail transportation and the big lorries were more efficient, but they are not, especially if the delivery time costs money. More and more is being invested in inter-factory transport with low-tonnage trucks, cargo vans and pickups. In the near future, this trend is going to deepen.

12.06.03. BAD WAYS TO FORCE UNCLOGGING

Now let's look at a few not sensible but rather primitive ways of forcefully dealing with bottlenecks. If we rely on these ways, we may temporarily or partially resolve an ongoing and possibly local problem, but because we will not have attacked the deep root causes of the bottleneck, it will recur.

Getting caught up in throwing bonuses in the bottleneck for timely completion of an urgent order may lead (and it may and not lead) to its urgent completion. From that moment on, after you have the genie out of the bottle, any next order, whether urgent or not, will be deliberately delayed until bonuses are promised. People in the wide places after the bottleneck will also ask for a bonus, and as to provide their own arguments, they will skilfully conceal their real capacities. The thoughtless temporary introduction of additional operative personnel into clogged bottleneck is also a frequently and widely used solution. If they have the qualifications, yes... But if they do not have the necessary qualifications, the time in the bottleneck will be wasted, and it will become even more clogged. There is also the vicious practice of declaiming fervent speeches and holding desperate meetings about the urgency of any late order. There is a big risk that every order will become urgent if there are no speeches and meetings for it.

In some companies, the bottlenecks are managed under supervision or the direct involvement of a senior manager. And then, out of sight and out of mind, every place will become a bottleneck if it's out of the attention of this senior manager.

Other companies have the practice of having bottlenecks overseen by a hard-line manager who tightens the technological and organisational discipline. This can create conflicts between people in the bottleneck and people in other work places. A risk of increasing the internal and even external personnel turnover also grow. The panic decision is to replace the direct boss in the bottleneck on the fly. Such a decision may be all right once or twice. Once it becomes a regular practice, it brings about uncertainty and a lack of clarity in career growth. It can create a tainted atmosphere between the individual levels and units, inflame smouldering conflicts, and give rise to the turnover of middle and direct managers.

13.03.03. PRIORITY BY ORDER EXECUTION TIME

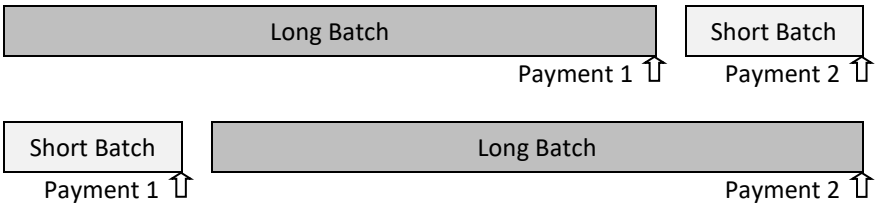
We first execute these orders that we will be able to complete in a shorter time. The orders that take more time are left to wait. This is almost the perfect priority from at least two points of view. On one hand, the total waiting time in the production order queue will be reduced. On the other hand, this priority will allow us to load our production capacities relatively evenly.

Let's imagine a dentist's office. There's a queue of patients who didn't book an appointment in advance, and there's no patient with an emergency. What's going to happen? The dentist comes out and starts asking, "What are you here for, what are you here for?". And no one patient is his friend. They're all equal. Who will the dentist invite to come in? The one he can serve most quickly.

Here we see an experienced production boss. He has a passion to aim and select slower for execution or non-urgent orders, and longer series. Such orders and series clog up and block the factory capacity, while at the same time, short series and urgent orders angrily knock on the door of traders and senior management.

This production boss runs to the high-rank bosses and insistently cries for more people, more machines, more materials, and more areas to put out fires.

PRIORITY OF SHORT SERIES WITH FAST PAYMENTS



Prioritisation of customer and production orders according to the length of the series, respectively, according to the completion time there is another seductive advantage. First, we place into production the shortest series. And then we place the long series last. This allows us to receive a large part of the payments earlier.

14.05. NO LOSSES FROM SURPLUSES AND INSUFFISANCES

The losses, especially which are related to surpluses and deficiencies, are directly related to the delivery size (or, which is the same, to the delivery period length).

The less often and in larger quantities we order, the more likely we are to accumulate surpluses. And if we fall into a deficit situation, it will last a long and painful time if the next delivery is late. In the case of big deliveries, we have big surpluses and big deficits.

Conversely, in the case of small deliveries, even if we accumulate an excess, we will quickly get rid of it. If we are running a stock deficit and the next delivery is literally due within days, there are no risks for business. There is a fairy tale – we will borrow from the neighbour and plug the hole again...

Surpluses and deficits punish us and show that we are sinners who lack faith in good powers. We need a Guardian Angel.

The Guardian Angel in this case is the gentle supplier who has mastered the manner of delivering often in small series. It goes without saying the spirit of long-term partnership has enveloped us. And if a surplus arises, then the Guardian Angel will deliver less next time. He might even be willing to buy back any excess.

If we find in a situation of deficit because the supplier is used to supply frequent small quantities, he will make urgent supplies in the necessary quantities to plug the holes. The supplier will save us from both surpluses and deficits.

This is the Guardian Angel – the supplier, who has acquired as second nature the manner of delivering frequently and in small quantities to their customers.

14.05.01. BALANCE OF FORCES

A fundamental principle of Industrial Logistics states: Work with equal to you! It doesn't feel comfortable being a small customer of a very large supplier. And it's not at all comfortable being a big customer of a very large number of small suppliers. In the latter case, there is a solution, and it is in the integral suppliers. The supplier and producer must be of the same calibre. Let us respect the principle of working with suppliers of equal calibre. Most of our purchasing problems are due to the fact that we are not equal in power with our suppliers.

15.03.06.05. QUICK RESPONSE QUALITY CONTROL (QRQC)

QRQC (acronym of Quick Response Quality Control) is a variety of Daily Management, or at least the logic is similar – a fast and standardised response to anomalies.

The QRQC method is a creation of the French company Valeo, one of the main suppliers to the automotive sector. QRQC is based on two central ideas.

The first idea is that if a problem arises, we stop the process and don't release it until the problem is solved. The second idea is to implement a standardised set of corrective measures to address quickly possible to direct causes of the problem.

If you look in more detail, the QRQC method is based of four successive steps.

Step 1 rests on the principles of Jidoka and Autonomation and contains three parallel actions – detecting the problem (Action 1), stopping the process (Action 2), and describing everything known about the problem (Action 3).

Step 2 consists of two parallel sub-steps. One is to be warned about the problem and all production units that may be affected by the possible consequences or possible spread of the problem. The problem is detected in machine X and is due to unsuitable material Y. This material can be sent to other machines, let's warn people there. Here we can recall the practice of Jidoka Yokoten from Chapter 08 for TPM; see page 247. The second sub-step of step 2 is to report the problem to all units and persons who are competent or may be competent with regard to possible causes of the problem. This means waiting for their help.

Step 3 – Quickly finding and removing at least the direct causes. This is done at the place where the problem comes to light, as soon as it has arisen, and together with the owners of the process. Why with the process owners? First, because they have a considered opinion about the problem. And secondly, because they would be expected to support the decision, even if it was given by other people.

Step 4 – Check that the problem has been solved effectively and permanently. Finally, information is submitted to the stakeholders and units that the problem has been solved, along with details of the solution. So, if the same problem comes up somewhere else, we have a ready-made answer on how to detect and solve it.

16.02. PRE-HISTORY OF KAIZEN TEAMS

In the early 1950s, Dr Joseph Juran and Dr Edward Deming gave TQM courses to owners and senior managers of some larger Japanese companies. This was followed by large-scale training programmes in which owners and senior managers cascaded what they learned from Deming and Juran to their teams. Then they cascaded it down to the middle levels and then to the lower levels. In the majority of cases, the training programmes were organised by the Japanese Union of Scientists and Engineers, chaired by Prof. Kaoru Ishikawa.

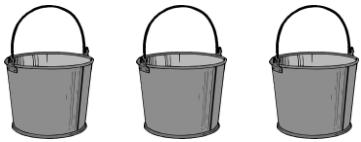
By the end of the 1950s, almost all Japanese managers of all levels had been trained in the principles and tools of TQM. At the end of the 1950s and in the 1960s, the timid idea emerged that operative personnel should also be involved in the continual improvement activities. That's how Quality Circles were born.

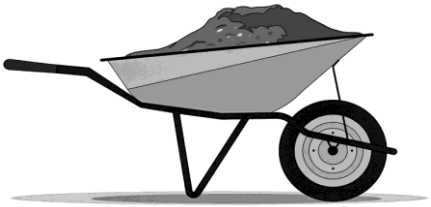
The Americans quickly realised that if it was being done in Japan, why not do it too. In the 1970s, the idea of quality circles moved to America, then to Western Europe, and from there, in the 1980s it rapidly came to Bulgarian enterprises. Many Bulgarian enterprises embraced this initiative with the almost unwavering faith that Bulgarian quality would soon approach and exceed the world level.

The dear reader holds in his hand a book written by a proud mentor of a quality circle who won first place in a national competition in 1987. It was a quality circle of maids in a big hotel in Albena (a famous Black Sea Resort). In this quality circle are involved ladies with at least one university degree. For clarification, in those years (the 1980s), in Bulgaria, the maids of the Black Sea resorts had higher salaries and incomes than these who exercised their professions as university graduates. This quality circle analysed where the ill-mannered guests discarded their cigarette butts and optimised the locations of the ashtrays in the hotel lobbies and corridors. For this noble purpose, the quality circle used the Concentration Charts and Spaghetti Diagrammes.

In the 1980s, although there were quite a few active quality circles, an error was made in the US and Europe, as well as in Bulgaria. This mistake was that the managers relied on the workers to lead the process of improvement. The managers said: Let them do the work; we'll just stand by and applaud them... Quality circles in the United States, in Europe, in Bulgaria, and all over the world failed and disappeared due to the ridiculous mistake of thinking that the quality improvement activities could be fully entrusted to the operative personnel without previously all senior and middle managers and technical professionals to have contributed to the quality assurance with whatever depended on them.

17.02.05. THE SPECIALISED TECHNOLOGICAL DEVICES SPEED UP FLOW AND BALANCE RESOURCE LOADING





I was building a gazebo in the backyard of the villa. I ordered a lorry with gravel for its base. I also hired three workers to carry and spread the gravel. The lorry came and poured 8 tonnes of gravel. The distance from the pile of gravel to the gazebo site was 20 metres. The work flowed in the following way. Worker X fills a wheelbarrow with shovel. Worker Y pushes the wheelbarrow to the gazebo. Worker Z spreads gravel with a garden rake. Worker Y returns the wheelbarrow at the gravel pile. The cycle repeats. While worker Y pushes the wheelbarrow to the gazebo site and back, worker X waits. By the time worker Y returns the wheelbarrow, by the time worker X fills it, and by the time worker Y waits for the gravel, and then pushes the wheelbarrow to the gazebo site, during the same time, worker Z has already spread the gravel and is wondering what to do… At first glance, all the work looks good organised. No, it doesn't. Worker Z, with his garden rake, sometimes works, sometimes waits. Worker Y waits while worker X fills the wheelbarrow. Worker X is idle while worker Y pushes the wheelbarrow around the yard. The workers moved half a pile of gravel in 4 hours, got tired, and sat down to lunch and rest. Everyone had pain in certain muscle groups. I felt sorry for them and offered them a new and more effective organisation. I changed the organisation for two things. One is that I gave them three buckets, each for 25 kg of gravel. Secondly, I convinced them to give up divided labour. Worker X fills the buckets with gravel and pours them into the wheelbarrow. Worker Y puches the wheelbarrow. Worker Z spreads the gravel. Every three cycles workers switch jobs. They carried and spread the second half of the pile of gravel in two hours, without anyone getting overworked or bored. The additional specialised technological equipment (the three buckets for intermediate gravel reloading) accelerated the flow and equalised working load.

18.21.03. PROS AND CONS OF THE PILOT COMPANIES WITHIN A GROUP OF COMPANIES

Advantages	Disadvantages
They are selected according their ability to easily and quickly achieve significant and visible results	This may delay or hinder the transfer of good practices and thus cause discouragement
They have the incentives to run faster along the Lean tracks	Keeping distance from other companies to protect their pilot role
They accumulate valuable know-how with regard to the specifics of deployment	It's not properly documented. They're not willing to share it with the other companies

In quite a few company groups, one of the companies is designated as a pilot company, and this pilot company leads the pack in terms of some types of innovations and improvements, which then cascade to other companies in the group. Let us look at the advantages and disadvantages of pilot companies. A pilot company is selected according to criteria of high technological, technical, educational, and organisational level. This high level indicates that this company achieves significant and visible results easily and quickly. If there are drastic differences in the levels of the pilot company compared to the other companies in the group, the transfer of pilot innovations and improvements may be delayed or impeded. This will lead to discouragement. The management of the pilot company incentives to keep the company running fast along the Lean tracks. The management of the pilot company has an interest in keeping it increasingly distant from the other companies in order to protect its company's pilot role. Pilot company accumulates large experience and know-how on implementation problems and relevant solutions. The more knowledge is accumulated, the more the risk grows that the pilot company will be selfish and forget about its mission. This may give rise to the temptation not to properly document the know-how or, which is almost the same, not to share the know-how willingly to other companies. Let's also ask ourselves how useful oral remote consultations are, whether by phone or video link. This violates the Gemba principle (see Chapter 15, p. 487). The peculiar issue is that the consultants won't stop telling us that we ought to go to Gemba more frequently. Even if you know and understand Lean, you cannot be a useful consultant if you have not immersed yourself in the realities of production, if you have not seen and heard things with your eyes and ears, if you are not in front of people face to face and if you do not have a quick and justified answer to the practical questions that most often arise after each other.

19.04.02.03. HOW NOT TO MOTIVATE?

Whether we are capable or not of motivating, it is more important to know which motivating means lead to demotivation. There are mechanically imported motivational models in Bulgaria which are not only inapplicable in our environment but are contraindicated. Models of motivation, inconsistent with national characteristics, are doomed to failure or, at least, will not lead to results.

Poster boards with fotos of best workers for the current week (or for the past month or year), corners of labour glory, and more nonsense. This was invented in America in the 1930s, then transferred to the USSR, and in the 1950s, it was copied in our country Bulgaria. Then in the 1990s, we rejected it, and now we're returning it mainly under the pressure of some foreign employers.

Another perversion is the public praise of good workers who essentially means public rebuke of all others who, so should be implied, are not good workers…

The Strong Signal Principle states that in order for incentives or penalties to be effective, they size must be commensurate with the size of the base salary. Small bonuses are not motivating. They only arouse envy and controversy. Small penalties also are not motivating. They only breed hatred or incite to revenge.

There is no any useful motivational effect in egalitarian, late or pointless incentives and awards or in bonuses proportional to a traineeship or salary.

In 1981, well-made silver jubilee medals were minted for the celebrations of the 1300th anniversary of the founding of the state of Bulgaria. These medals were distributed to plants and organisations according to the size of the work force and were designated to decorate the breasts of the best people. The number of medals was determined by the formula "one medal per ten persons". At the time, I was working at a science institute. By chance, a mistake was made, and our institute was awarded not 30 but 300 medals, so there was a medal for each person. I was working in a room with two colleagues. The courier arrived at the door without knocking. She had a frowning expression, as befitted at such type of administrator. She had a shoe box full of medals in one hand and a check list and a pen in the other. "Sign here!" she commanded, threw three medals – one medal per desk – with the mastered volley of skilful basketeer and then went around the other rooms to toss the other medals to the other prizers.

When we don't know what types of motivation are acceptable to people, it's best not to try to motivate them. Bulgarians have a proverb about absurdities with the opposite of expected results: Instead of combing eyebrows, you pierce eyes.

EXCERPT FROM CHAPTER 19. INCLUSION AND MOTIVATION TO PARTICIPATE IN IMPROVEMENTS

20.07.04. LEAN PRODUCTION AND SIX SIGMA

For centuries, armies used smoke screens as a tactical means of misleading their opponent and concealing their forces, positions and directions. A smokescreen is also a means of exhausting your opponent, because by firing into the smoke, they are wasting ammunition. You wear him out by getting him to make unnecessary manoeuvres.

Companies likewise in their fierce competitive battles, also use smokescreens. Rank Xerox in the 1970s used Benchmarking smokescreen against their rivals. The smokescreen consisted of Rank Xerox making a competitive comparison of the product benchmarks of the world's three best companies, in the aims of specifying areas where they could catch up. It was a smoke screen. In fact, Rank Xerox was far ahead of competitors with their radical technical innovations to reduce toner consumption and bring the service network closer to the point of sales. The smokescreen of Motorola in the '80s and then of General Electric in the'90s is the Six Sigma approach, which requires knowledge of stochastic modelling and Design of experiments, which most companies do not have.

Lean is an approach to accelerating and levelling the flow – combating losses due to topological, technological or organisational reasons.

Six Sigma is a methodology for improving the quality of the product by stabilizing and optimizing the parameters and modes of the processes. This is done by applying statistical methodologies by project teams. The project team defines the task itself and then solves the task itself. They report the results to management and receive applause.

I'm not going to elaborate. There are reasons, mainly related to the specification for automotive suppliers IATF 16949:2016, which is why the market of Six Sigma has collapsed. This is because the Sigma methods are mostly statistical process control (SPC) methods, and according to IATF 16949 SPC is a mandatory quality assurance tool.

Then Lean Six Sigma came into the market. In recent years, if something is linked to the Lean mantra, it becomes more marketable. If I decided to sell Lean cucumbers, they're more marketable than other cucumbers.

Sales potential is further strengthened by suggestions that taking a Lean Six Sigma certified course will benefit your personal career. I have my doubts about the curriculum of these courses. Some time ago, a self-confident black belt Lean Six Sigma consultant applied to work with us. I asked him about the difference between Poisson distribution and Boltzmann distribution, and the black belt curiously exclaimed, "What's all this about distribution?".