



Data is of course important in manufacturing, but I place the greatest emphasis on facts.

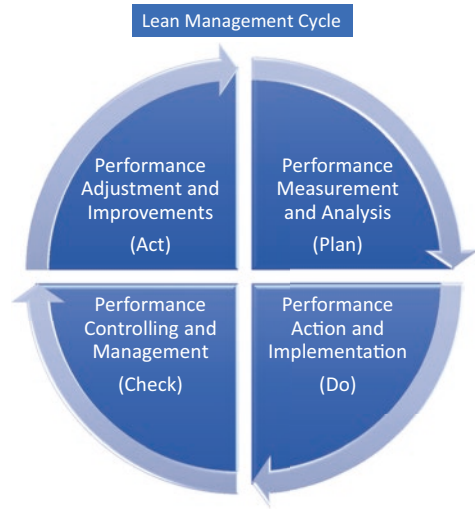
Taiichi Ohno (1912–1990)

12.1 The Lean Performance Management Cycle

Lean management must be an integral part of any enterprise and organization. Performance improvements and permanent adjustments are important factors for the successful implementation of lean structures. Performance management therefore integrates a cycle from performance measurement and analysis (Plan), the performance action and implementation (Do), the performance management controlling (Check), and the performance improvements and adjustments (Act) as illustrated in the lean performance management cycle in Fig. 12.1. The figure shows the lean performance management cycle as an iterative and continuous process for the control and improvement of processes, products, or services. The original P-D-C-A four-step framework is also known as Deming circle.

PM is a basic and efficient methodology. It portrays the administration of enterprises, processes, HR, divisions, and associations to ensure that objectives and destinations are being reached. The objectives and destinations are gotten from client's desires which are the bases of the key mission and vision in an endeavour. Performance measurement and the administration must be executed over the whole value chain and applies to all functions and department (Helmold et al. 2019). PM reaches from the upstream value chain over the operation to the downstream supply chain management. Performance management involves defining what effective performance looks like, as developing the tools and procedures necessary to measure performance. The overall goal of performance management is to ensure that the organization and all of its subsystems (processes, departments, teams, employees,

Fig. 12.1 Lean performance excellence.
(Source: Author)



etc.) are working together in an optimum fashion to achieve the results desired by the organization.

Performance management can be done externally (e.g. measurement by customers, by shareholders or analysts, measurement of supply base) and internally (management of organization). PM must include the entire value chain and all elements including USCM, operations, DSCM, and support functions like finance, logistics, human resources (HR), or information technology (IT). Purely financial PM is not successful, so that all stakeholders and functions have to integrate and collaborate in order to achieve the excellent performance. The key questions related to performance management are:

- What is performance management?
- Where do I measure performance?
- What do I measure?
- How can I measure performance?
- When do I measure performance?
- How can I improve the performance?

Enterprises must aim for PM excellence. Permanent measurement and improvements are crucial activities by top management. PM is a core activity and must be pursued by all departments. In addition, there are certain characteristics of PM that can be described as follows (Fig. 12.2):

1. PM has to be executed over the entire value chain from the upstream over the operation to the downstream supply chain management.
2. PM is a structural and systematic approach in enterprises and organization.
3. PM must be coordinated and implemented by top management.

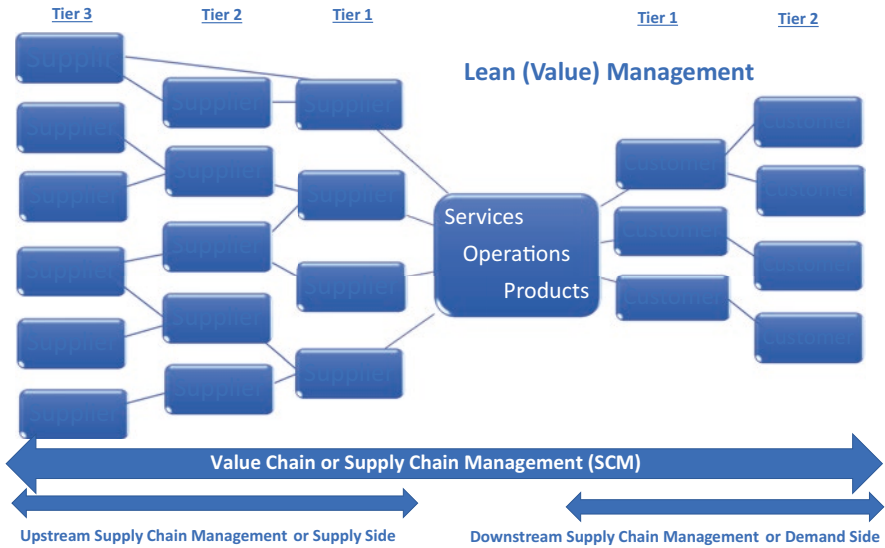


Fig. 12.2 Lean management across the value chain. (Source: Author)

4. PM deals with enterprises, processes, employees, departments, and organizations.
5. PM is using tools, mechanics, and procedures necessary to measure performance (BSC, Audits, or EFQM).
6. PM goals and objectives to perform efficiently and effectively.
7. PM goals are relevant to customer and stakeholder expectations.
8. PM goals and objectives are derived from customer’s (and stakeholder) expectations which are the bases of the strategic mission and vision.
9. PM uses qualitative and quantitative measurables and key performance indicators (KPI).
10. PM strives for excellence and permanent improvements.

12.2 Lean Performance Excellence

Performance excellence can be defined as achieving and maintaining outstanding and superior levels of performance that meet and exceed the expectations of the stakeholders (Helmold and Samara 2019). There are a huge number of stakeholders for any business or enterprise, and to be assessed as excellent, these enterprises have to be achieving an outstanding level of performance for all of their different stakeholders: employees, customers, shareholders, owners, and the wider community. To achieve sustained and superior levels of excellence, it is mandatory for enterprises and organizations to permanently assess the situation and to strive for improvement by initiating continuous improvement programmes like the Toyota production system or excellence models.

Excellence model allows the management of enterprises and organizations to understand the cause and effect relationships between what their organization does (actual performance), the enablers, and the results it achieves in comparison to set objectives (plan). The model comprises three integrated components. Fundamental excellence concepts underlie principles that form the foundation for achieving sustainable excellence in any organization. These principles can be described as:

- Adding value for customers
- Creating a sustainable future
- Harnessing creativity and innovation
- Managing with agility
- Developing organizational capability
- Leading with vision, inspiration, and integrity
- Succeeding through the talent of people
- Sustaining outstanding results

The goal of any excellence initiative and programme must therefore be to achieve world-class excellence as illustrated in Fig. 12.3. The system, developed by Dr. Marc Helmold, is similar to the German school grading system (1 = very good, 5 = failed). Companies usually start as so-called laggards (Level 5) (Helmold et al. 2019). A laggard can be defined as organization that falls behind similar companies in the same industry. The next level is a “standard” performance (Level 4). Standard means in this context that enterprises have an average performance level in a certain sector. The next level is “maturity” in performance including some best practices (Level 3). After the maturity organizations will achieve the “industry excellence” (Level 2) level. In this level, performance is outstanding within the industry. The last

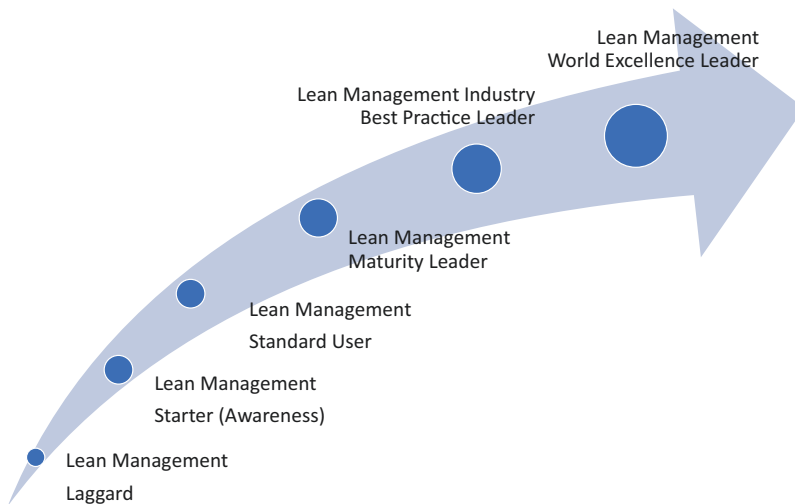


Fig. 12.3 Lean management excellence. (Source: Author’s own figure)

and highest level is the world class excellence level, in which organizations are benchmarks in terms of excellence on a global scale (Level 1) (Helmold et al. 2019).

12.3 Key Performance Indicators (KPI)

Key performance indicators (KPI) are a set of quantifiable measures that a company uses to gauge its performance over time. These metrics are used to determine a company's progress in achieving its strategic and operational goals and also to compare a company's finances and performance against other businesses within its industry. A key performance indicator (KPI) is a measure of your performance against key business objectives. High-level KPIs may focus on the overall performance of the enterprise, while low-level KPIs may focus on processes or employees in departments such as sales, marketing, or a call centre.

12.4 Objective Key Results (OKR)

The OKR system is a performance tool that sets, communicates, and monitors goals in an organization so that all employees work together in one direction. The development of OKRs is generally attributed to Andy Grove, the "Father of OKRs", who introduced the approach to Intel during his tenure there and documented this in his 1983 book *High Output Management*. Objectives and key results (OKR) is a popular leadership process for setting, communicating, and monitoring quarterly goals and results in organizations. The goal of OKRs is to connect company, team, and personal objectives in a hierarchical way to measurable results, making all employees work together in one unified direction, by using the SMART-objective methodology. OKRs consist of a list of three to five high-level objectives. Under each objective then usually three to five key measurable results are listed. Each key result has a progress indicator or score of 0 to 100 percent or 0 to 1.0 that shows its achievement. The advantages can be outlined as follows:

- Goal focused company alignment: align with your leadership team on top priorities and highest leverage activities each quarter
- Fit Objectives into company vision, mission, and values to motivate your company with purpose
- Visibility into company, department and individual progress, wins, and road blocked areas

KPIs are important for the plant floor because they are highly effective for exposing, quantifying, and visualizing muda (the lean term for waste); and they are also highly effective motivators. The essence of lean manufacturing and the central theme of the Toyota production system are to eliminate waste – to relentlessly eliminate all activities that do not add value for your customer. Effective KPIs quantify

waste; provide an early warning system for processes operating outside the norm; and offer important hints to where improvement efforts should be focused.

KPIs also function as very effective motivators. Motivation theory is a complex field with many diverse opinions. However, there is wide agreement that a central key to effective motivation is setting challenging but attainable goals (e.g. SMART goals, which are specific, measurable, achievable, realistic, and time-specific). SMART goals are ideal candidates for plant floor KPIs.

For example, a manufacturing plant with semi-automated processes introduced real-time visual KPIs as a means of motivating their operators. One of their engineers mistakenly set the expected run rate for a cell at 180 pieces per minute instead of the normal 140 pieces per minute. Hours later the engineer returned and was astonished to find the cell averaging 178 pieces per minute. Visual KPIs had motivated the operators to greatly exceed what the process engineers had thought was possible.

There is a connection between the two real-time KPI perspectives: the lean manufacturing perspective of eliminating waste and the corporate perspective of achieving strategic goals. They are connected through waste.

From a broad lean perspective, the seven major forms of waste in the manufacturing process include the TIMWOOD model. The model shows how objectives can be defined:

- Transport: distance, time
- Inventory: money, quantity
- Motion: time
- Waiting: time, number of operators waiting, place of waiting
- Overproduction: number of goods, money for overproduced goods, employees involved
- Overprocessing: employees involved
- Defects: number of defects, money (loss cost)

12.5 Case Study: Microsoft's Strategy and Objectives

Fiscal year 2019 was a record-breaking year for Microsoft. They achieved more than \$125 billion in revenues and \$43 billion in operating income and more than \$50 billion in operating cash flow (Microsoft 2019). The enterprise returned more than \$30 billion to its shareholders. The commercial cloud business is the largest in the world, surpassing \$38 billion in revenue for the year, with gross margin expanding to 63 percent. Consumers, students, teachers, and more than 2 billion first-line workers around the world are using Microsoft products. The mission statement to empower every person and every organization on the planet to achieve more is one of the key elements in the strategy of Microsoft. Microsoft IT platforms and tools enable small businesses to be more productive, multinationals to be more competitive, nonprofit organizations to be more effective, and governments to be more efficient. At present, Microsoft is a technology company, and every organization will

increasingly need to build its own proprietary technology solutions to compete and grow. The organization embraces this approach to adopt best-in-class software and services but also build their own digital capability. Computing is becoming embedded in the world, in every place and everything. This era of the intelligent cloud and intelligent edge is shaping the next phase of innovation, powering intelligent systems and experiences that previously would have been unimaginable, and transforming nearly everything around us. Across Microsoft's businesses, we are innovating to empower our customers and investing in large and growing markets to help them digitally transform.

Applications and Infrastructure In a world where every company is a digital company, developers will play an increasingly vital role in value creation and growth across every industry, and GitHub is their home. Since the acquisition of GitHub last fall, growth has accelerated. Today it's used by more than 40 million developers, including those who work at the majority of the Fortune 50. Microsoft is building Azure as the world's computer, addressing customers' real-world operational sovereignty and regulatory needs. Today, 95 percent of the Fortune 500 trust Azure for their mission-critical workloads.

Data and AI The variety, velocity, and volume of data is increasing – with 50 billion connected devices coming online by 2030, more than double the number today – and Azure is the only cloud with limitless data and analytics capabilities across our customers' entire data estate. We brought hyperscale capabilities to our relational database services for the first time this year, and we offer the most comprehensive cloud analytics – from Azure Data Factory to Azure SQL Data Warehouse to Power BI. The quintessential characteristic for every application going forward will be AI, and we believe it cannot be the exclusive province of a few companies or countries. That's why we are democratizing AI infrastructure, tools, and services with Azure Cognitive Services, so any developer can embed the ability to see, hear, respond, translate, reason, and more into their applications. Azure Cognitive Services is the most comprehensive portfolio of AI tools available, and this year, we added new speech-to-text, search, vision, and decision capabilities, as well as updates to Azure Machine Learning to streamline the building, training, and deployment of machine learning models.

Business Applications Dynamics 365 uniquely enables any organization to create digital feedback loops that take data from one system and use it to optimize the outcomes of another, enabling any business to become AI-first. This year, we introduced Dynamics 365 AI, a new class of AI application built for an era where systems of record and engagement are converted into intelligence. And the Open Data Initiative we launched with Adobe and SAP last fall takes this even further, delivering on our vision to enable data to be exchanged and enriched across systems to provide unparalleled business insight.

Microsoft is enabling our customers to digitize not only their business processes but to bridge the physical and digital worlds with our investments in mixed-reality cloud. The new HoloLens 2 is the most advanced, intelligent edge device available, offering two times the field of view and three times the comfort as the previous version. And, together with Dynamics 365 and new Azure mixed-reality services, it enables organizations to digitize physical spaces and interactions and empower their first-line employees with the right information at the right time, in the context of their work.

LinkedIn now has more than 645 million members and is the most comprehensive solution for every organization to manage and engage their most important resource – their talent. Our Talent portfolio – from Talent Solutions and Talent Insights, to employee engagement with Glint and LinkedIn Learning – enables every organization to attract, retain, and develop the best talent in an increasingly competitive jobs market.

Modern Workplace Microsoft 365 empowers everyone – enterprises, small businesses, and first-line workers – with an integrated, secure experience that transcends any one device. We are helping every business build out their system of communication and collaboration to drive their productivity as well as their business transformation. We are infusing AI across Microsoft 365 to enable new automation, prediction, translation, and insights capabilities. Meetings are more inclusive in Microsoft Teams, presentations more accessible in PowerPoint, videos more searchable in Stream, and emails more relevant in Outlook. And with Workplace Analytics and Microsoft Search, we distil knowledge and insights from data to help people work smarter, not longer. Office 365 Commercial has 180 million users. Our EMS install base exceeded 100 million. And the Outlook apps on iOS and Android also surpassed more than 100 million users for the first time.

Gaming In gaming, Microsoft is pursuing our expansive opportunity to transform how games are distributed, played, and viewed. Our new breakthrough game streaming technology, Project xCloud, will enter public trials this fall. It will put gamers at the centre of their gaming experience, enabling them to play games in high-fidelity wherever and whenever they want, on any device.

Microsoft Game Stack brings together our tools and services to empower game developers – from independent creators to the biggest game studios – to build, operate, and scale cloud-first games across mobile, PC, and console. Our growing Xbox Live community is key to our approach, and for the first time we are enabling developers to reach these highly engaged gamers on iOS and Android. Finally, we increased our first-party game studios to 15 this year to deliver differentiated content for our fast-growing subscription services like Xbox Game Pass, which is now available on both console and PC.

CSR Beyond these three pillars, we are working to foster a sustainable future where everyone has access to the benefits and opportunities created by technology.

As a reflection of the importance we place on advancing environmental and social progress, Microsoft's board of directors has a Regulatory and Public Policy Committee that works together with me, my leadership team, and others across Microsoft to oversee our commitments to environmental sustainability and corporate social responsibility. No single company is going to solve macro challenges like climate change alone, but as a global technology company, we are well-positioned to enable and accelerate digital transformations that lead to a low-carbon future. That is why we are stepping up our commitment. Over the past year, we expanded our work through our operations, investments, partnerships, and advocacy across initiatives spanning both environmental and social responsibility.

We continue to operate carbon neutral across our worldwide operations, driven by an internal carbon tax, as we have every year since 2012. And we've taken new steps over the past year to align our carbon-reduction efforts with the latest climate science by setting a goal to reduce our operational emissions by 75 percent by 2030, which puts us on a path to exceed the ambitions of the Paris Accord two decades ahead of schedule. This year, we raised our carbon fee to \$15 per metric ton, a near doubling of the previous fee, to put sustainability at the core of every part of our business. We're also extending our carbon reduction targets beyond our own operations. We will cut carbon emissions by 30 percent across our global supply chain by 2030. And in October, we extended our carbon-neutrality commitment to our products and devices with a pilot to make 825,000 Xbox consoles carbon neutral.

We are committed to ensuring our datacentres are among the most sustainable in the world. By the end of this year, we will achieve our target of powering our datacentres with 60 percent renewable energy and will aim to reach 70 percent renewable energy within the next 4 years. In fact, when I was in Sweden this spring, we announced our plans to build some of the most advanced and sustainable datacentres to date, powered from 100 percent renewable energy and with zero-waste operations.

And, we are also working with our customers and partners to help them use technology to reduce their own environmental footprints and create their own solutions for a more sustainable planet. Our AI for Earth program, as an example, has expanded access to massive environmental data sets that can help others generate valuable insights about the health of our planet, including the conditions of our air, water, land, and the well-being of our wildlife. And it supports organizations that are applying AI to environmental challenges, by helping them harness the full power of cloud computing.

We are working with organizations around the world to enable young people – including those who identify as female and under-represented minorities – with the digital skills required for the future. For example, we are the largest funder of [Code.org](#), which teaches coding skills and reaches students in almost every country.

We know that there is a broadband gap, and that's why, in the USA, our Airband program is using a mixed-technology approach, including TV whitespaces, to connect 3 million people living in unserved rural areas to broadband by 2022. And

we're working in more than 20 countries, harnessing this same technology to bring broadband to rural communities elsewhere.

We also know that access to affordable housing is a significant barrier for many, and this year, we launched a major initiative to expand housing options for people who work in the Puget Sound region where we are headquartered. We believe that everyone should be able to choose to live in the community where they work, not just our employees and business partners, but all those who serve the broader community, from teachers and small-business owners to first responders and medical practitioners. It's why we are putting \$500 million to work in loans and grants to accelerate the construction of more affordable housing in the region.

Finally, more broadly, we've expanded our support for the nonprofit sector. We work closely with nonprofit organizations to help them accelerate their organizational transformation with technology, and, in fiscal 2019, Microsoft donated or provided discounted software and services worth more than \$1.5 billion via Microsoft Philanthropies. Our employees generously donated an additional \$170 million (including company match) through our employee giving program to support nonprofits in local communities around the world.

References

- Helmold, M., & Samara, W. (2019). *Progress in Performance Management Industry Insights and Case Studies on Principles, Application Tools, and Practice*. Heidelberg: Springer.
- Helmold, M., Dathe, T., & Hummel, F. (2019). *Erfolgreiche Verhandlungen – Best-in-Class Empfehlungen für den Verhandlungsdurchbruch*. Wiesbaden: Springer.
- Microsoft (2019). www.microsoft.com.