**Lean six gamma:**  is a method that relies on a collaborative team effort to improve performance by systematically removing waste[[1]](https://en.wikipedia.org/wiki/Lean_Six_Sigma" \l "cite_note-1) and reducing variation. It combines [lean manufacturing](https://en.wikipedia.org/wiki/Lean_manufacturing" \o "Lean manufacturing)/[lean enterprise](https://en.wikipedia.org/wiki/Lean_enterprise" \o "Lean enterprise) and [Six Sigma](https://en.wikipedia.org/wiki/Six_Sigma" \o "Six Sigma) to eliminate the eight kinds of waste (*[muda](https://en.wikipedia.org/wiki/Muda_(Japanese_term)" \o "Muda (Japanese term))*).

Lean entreprise: is a practice focused on value creation for the end customer with minimal waste and processes

Six Sigma strategies seek to improve [manufacturing](https://en.wikipedia.org/wiki/Manufacturing" \o "Manufacturing)quality by identifying and removing the causes of defects and minimizing [variability](https://en.wikipedia.org/wiki/Statistical_dispersion" \o "Statistical dispersion) in manufacturing and [business processes](https://en.wikipedia.org/wiki/Business_process" \o "Business process). This is done by using empirical and statistical [quality management](https://en.wikipedia.org/wiki/Quality_management" \o "Quality management) methods and by hiring people who serve as Six Sigma experts. Each Six Sigma project follows a defined methodology and has specific value targets, such as reducing pollution or increasing [customer satisfaction](https://en.wikipedia.org/wiki/Customer_satisfaction" \o "Customer satisfaction).

Lean Six Sigma is a synergized managerial concept of Lean and Six Sigma.[[5]](https://en.wikipedia.org/wiki/Lean_Six_Sigma" \l "cite_note-5) Lean traditionally focuses on eliminating the eight kinds of waste ("*[muda](https://en.wikipedia.org/wiki/Muda_(Japanese_term)" \o "Muda (Japanese term))")*, and Six Sigma focuses on improving process output quality by identifying and removing the causes of defects (errors) and minimizing variability in (manufacturing and business) processes.

Lean Six Sigma uses the [DMAIC](https://en.wikipedia.org/wiki/DMAIC" \o "DMAIC) phases similar to that of Six Sigma. The five phases used in Lean Six Sigma aim to identify the root cause of inefficiencies and work with any process, product, or service that has a large amount of data or measurable characteristics available

**DMAIC** (an acronym for **Define, Measure, Analyze, Improve and Control**)[[1]](https://en.wikipedia.org/wiki/DMAIC" \l "cite_note-:0-1) (pronounced də-MAY-ick) refers to a data-driven improvement cycle used for improving, optimizing and stabilizing business processes and designs. The DMAIC improvement cycle is the core tool used to drive [Six Sigma](https://en.wikipedia.org/wiki/Six_Sigma" \o "Six Sigma) projects. However, DMAIC is not exclusive to Six Sigma and can be used as the framework for other improvement applications.[[2]](https://en.wikipedia.org/wiki/DMAIC" \l "cite_note-2)

Steps: define**;** Measure; Analyze; Improve; Control

## **Waste**

Waste (*muda*) is defined by [Fujio Cho](https://en.wikipedia.org/wiki/Fujio_Cho" \o "Fujio Cho) as "anything other than the minimum amount of equipment, materials, parts, space, and workers time, which are absolutely essential to add value to the product".[[7]](https://en.wikipedia.org/wiki/Lean_Six_Sigma" \l "cite_note-FOOTNOTESummers2011135-7)

Different types of waste have been defined in the form of a [mnemonic](https://en.wikipedia.org/wiki/Mnemonic" \o "Mnemonic) of "downtime":

* **D**efects: A defect is a product that is declared unfit for use, which requires the product to be either scrapped or reworked, costing the company time and money. Examples include a product that is scratched during the production process and incorrect assembly of a product due to unclear instructions.
* **O**ver-production: Over-production refers products made in excess or before it is needed. Examples include creating unnecessary reports and overproduction of a product before a customer has requested it.
* **W**aiting: Waiting involves delays in process steps and is split into two different categories: waiting for material and equipment and idle equipment. Examples include waiting for authorization from a superior, waiting for an email response, waiting for material delivery, and slow or faulty equipment.
* **N**on-Used Talent: Non-Used Talent refers to the waste of human potential and skill. The main cause is when management is segregated from employees; when this occurs, employees are not given the opportunity to provide feedback and recommendations to managers in order to improve the process flow and production suffers. Examples include poorly trained employees, lack of incentives for employees, and placing employees in jobs or positions that do not use all of their knowledge or skill.
* **T**ransportation: Transportation is the unnecessary or excessive movement of materials, products, people, equipment, and tools. Transportation adds no value to the product and can lead to product damage and defects. Examples include moving products between different functional areas and sending overstocked inventory back to an outlet warehouse.
* **I**nventory: Inventory refers to an excess in products and materials that are unprocessed. It is a problem because the product may become obsolete before the customer requires it, storing the inventory costs the company time and money, and the possibility of damage and defects increases over time. Examples include excess finished goods, finished goods that cannot be sold, and broken machines on the manufacturing floor.
* **M**otion: Motion is unnecessary movement by people.[[8]](https://en.wikipedia.org/wiki/Lean_Six_Sigma" \l "cite_note-8) Excessive motion wastes time and increases the chance of injury. Examples include walking to get tools, reaching for materials, and walking to different parts of the manufacturing floor to complete different tasks.
* **E**xtra-processing: Extra-processing is doing more work than is required or necessary to complete a task. Examples include double-entering data, unnecessary steps in production, unnecessary product customization, and using higher precision equipment than necessary.[[9]](https://en.wikipedia.org/wiki/Lean_Six_Sigma" \l "cite_note-9)

<https://en.wikipedia.org/wiki/Lean_Six_Sigma>

<https://en.wikipedia.org/wiki/DMAIC>

**Lean six sigma in finance:**

The international financial environment is more interconnected than ever, with [the effects of unstable or inconsistent monetary policies](https://blogs.imf.org/2019/04/10/weak-spots-in-global-financial-system-could-amplify-shocks/" \t "_blank) being felt far beyond a single organization. In today’s globalized economy, policy and operational problems in one country’s financial organizations can have severe economic consequences across the world.

As these ripple effects become more and more noticeable, the ability to critically analyze and improve processes across an organization is an increasingly valuable career skill. While management techniques like [Lean Six Sigma (LSS)](https://www.purdue.edu/leansixsigmaonline/) have roots in manufacturing, there are numerous applications for LSS in finance and accounting that can help to correct operational inefficiencies and minimize risk across an organization.

### Error Reduction

Lean Six Sigma allows for more focused and efficient operations in departments that are not entirely focused on manufacturing. [One particular case study](https://www.aabri.com/manuscripts/10630.pdf" \t "_blank) that focused on billing reconciliation found that billing errors resulted in customer accounts being charged less than the amount due approximately 60% of the time. After implementing LSS, however, the organization nearly eliminated this issue completely.

### Problem Identification

One of the strengths of LSS is that it uses quantitative methods to identify key points of impact (KPI). Once efficiency issues within these KPIs have been identified, LSS can be used to discreetly and specifically tackle those problems.

An essential tool in LSS for identifying KPIs and any associated issues [is the process map](https://www.purdue.edu/leansixsigmaonline/blog/six-sigma-process-map/). By defining the boundaries and needs of the current process, professionals can identify issues with existing procedures and use these findings to improve them or remove processes that aren’t generating value.

This is a key element of LSS and is referred to as the “DMAIC” or Define, Measure, Analyze, Improve, Control methodology. Pairing DMAIC with these LSS strategies offers a powerful way to objectively analyze and improve operations within an organization.

### Continuous Improvement

Lean Six Sigma is designed to be a [continuous improvement system](https://www.purdue.edu/leansixsigmaonline/blog/dmaic-vs-dmadv/), so training in LSS continues to be useful well past its initial introduction. By implementing the DMADV (Define, Measure, Analyze, Design, Verify) process, organizations are able to apply it to the creation of new workflows and processes in addition to improving existing ones.

While the initial application of the methodology often focuses directly on specific product and process improvements, companies such as [Capital One have found that applying lean six sigma in banking](https://onlinelibrary.wiley.com/doi/abs/10.1002/joe.20173" \t "_blank) yields results that go far beyond their day-to-day work.

Studies that have looked at the long-term effects of applying Lean Six Sigma in large companies have found improvements across many areas of business. For example, throughout Capital One’s restructuring, [one study identified](https://www.emerald.com/insight/content/doi/10.1108/IJLSS-08-2015-0029/full/html?fullSc=1&journalCode=ijlss" \t "_blank) the following LSS-driven benefits:

* Reduction in the rate of keying-in errors
* Increase in customer satisfaction
* Greater employee buy-in for LSS tools such as DMAIC

<https://www.purdue.edu/leansixsigmaonline/blog/benefits-of-six-sigma-in-finance-accounting/>

**lean six sigma on banking industry:**

In the banking industry, which aims to serve customers, management level and service level are one of the criteria for measuring the core competitiveness of banks. An important indicator of management and service levels is to ensure customer satisfaction with the bank used. Six Sigma management is customer-centric, based on data and facts, adopting improvement measures for the process, focusing on preventive control, emphasizing borderless cooperation, continuous improvement, and the pursuit of quality and efficiency management mechanisms.

Six Sigma management is a new process of a process change that reduces customer operating costs and cycles while improving customer satisfaction [[10](https://jqualityinnovation.springeropen.com/articles/10.1186/s40887-019-0028-6#ref-CR10)]. Six Sigma is a management model that enhances the profitability of an organization by improving the quality of its operations. Six Sigma is an effective management strategy for companies to gain competitiveness and sustainable development in a new economic environment [[10](https://jqualityinnovation.springeropen.com/articles/10.1186/s40887-019-0028-6#ref-CR10), [11](https://jqualityinnovation.springeropen.com/articles/10.1186/s40887-019-0028-6#ref-CR11)].

Relevant scholars have studied customer satisfaction, but these studies involve not many banks, and the use of Six Sigma for research is even rarer [[12](https://jqualityinnovation.springeropen.com/articles/10.1186/s40887-019-0028-6#ref-CR12),[13](https://jqualityinnovation.springeropen.com/articles/10.1186/s40887-019-0028-6#ref-CR13),[14](https://jqualityinnovation.springeropen.com/articles/10.1186/s40887-019-0028-6#ref-CR14),[15](https://jqualityinnovation.springeropen.com/articles/10.1186/s40887-019-0028-6#ref-CR15),[16](https://jqualityinnovation.springeropen.com/articles/10.1186/s40887-019-0028-6#ref-CR16)]. Based on the field survey, we designed the Six Sigma process for commercial bank customer satisfaction, and applied the method to retail bank customer management, enriched the customer satisfaction theory, and had a specific theoretical value for the development of customer satisfaction theory.

Six Sigma is a management model that continuously improves and breaks through and pursues excellence. It creates a “customer satisfaction” Six Sigma quality culture through Six Sigma management, continually improves process design, reduces process defects, achieves excellent customer satisfaction, and achieves higher customer requirements.

[**https://jqualityinnovation.springeropen.com/articles/10.1186/s40887-019-0028-6**](https://jqualityinnovation.springeropen.com/articles/10.1186/s40887-019-0028-6)