Instructors Guide



On the following pages is a sample module from our Instructor Guide. It provides the instructor with a copy of the material and a Lesson Plans box.

The key benefit for the trainer is the Lesson Plan box. It provides a standardized set of tools to assist the instructor for each lesson. The Lesson Plan box gives an estimated time to complete the lesson, any materials that are needed for the lesson, recommended activities, and additional points to assist in delivering the lessons such as Stories to Share and Delivery Tips.



Success is not checking a box. Success is having an impact. If you complete all tasks and nothing ever gets better, that's not success.

Christina Wodtke

Module Two: Introduction to Lean Six Sigma



The need for continuous process improvement has become a fundamental aspect of organizational success, as companies strive to increase efficiency and optimize their operations in a rapidly evolving marketplace. Organizations must continually strive to improve their processes in order to remain relevant, successful, and meet their customer needs. Lean Six Sigma is a comprehensive framework that combines two powerful approaches: Lean Manufacturing, which focuses on improving efficiency and eliminating waste, and Six Sigma, which focuses on improving quality and reducing defects. This data-driven methodology to problem-solving seeks to identify and eliminate

the root causes of errors, defects, and inefficiencies in a process. It can be applicable across a wide range of organizations and industries, from healthcare and manufacturing, to government and service sectors. Essentially, Lean Six Sigma is an excellent tool for organizations looking to stay competitive, achieve significant cost savings, and improve customer satisfaction.

What is Six Sigma?



Six Sigma has become increasingly popular in many industries and organizations around the world. Since it was first developed by Motorola in the 1980s, Six Sigma has become widely adopted by many of the world's leading corporations and Fortune 500 companies, including Ford, Amazon, and General Electric. Six Sigma uses statistical analysis and other tools to reduce defects and variability in a process to achieve a level of quality that will meet or exceed customer expectations. As more organizations recognize

the benefits of adopting a data-driven approach to process improvement, its popularity is likely to continue to grow.

Sigma refers to a statistical term representing the standard deviation of a process. The higher the sigma level, the less variation there is in the process. The goal of Six Sigma is to achieve a level of process performance in which the defect rate is less than 3.4 defects per million opportunities (DPMO). This is equivalent to a process capability of 6 sigma or higher.

The following is a breakdown of the Sigma levels:

- 1 Sigma = 690,000 defects/million = 31% accurate
- 2 Sigma = 308,537 defects/million = 69.1463% accurate
- 3 Sigma = 66,807 defects/million = 93.3193% accurate
- 4 Sigma = 6,210 defects/million = 99.3790% accurate
- 5 Sigma = 233 defects/million = 99.9767% accurate
- 6 Sigma = 3.4 defects/million = 99.999997% accurate

Estimated Time	7 minutes
Topic Objective	To explore the methodology of Six Sigma, and reflect on its development
	over the years.
Topic Summary	The goal of Six Sigma is to achieve a level of process performance in which
	the defect rate is less than 3.4 defects per million opportunities (DPMO).
Materials Required	Flipchart/board, markers
Planning Checklist	None
Recommended Activity	Have participants discuss how Six Sigma methodologies can be used to
	identify and prioritize improvement opportunities within an organization.
	Write these responses on the flipchart/board.
Stories to Share	Six Sigma training is typically organized into a hierarchical structure of belts,
	similar to martial arts. The different levels of Six Sigma belts include Yellow
	Belt, Green Belt, Black Belt, and Master Black Belt. The Yellow Belt level
	typically involves a basic understanding of Lean Six Sigma principles and
	techniques, while the Black Belt level involves extensive training in statistical
	analysis and problem-solving.
Delivery Tips	Encourage everyone to participate.
Review Questions	What is an example of a company that has adopted Six Sigma?

What is the goal of Six Sigma?

What is Lean?



Lean has revolutionized the way businesses operate. In essence, lean is about doing more with less, or rather maximizing value while minimizing resources. It is a methodology that was established based on the Toyota Production System, which was developed to improve efficiency and eliminate waste in their manufacturing processes. The goal of lean is to identify, as well as eradicate waste in business processes, such as unnecessary motion, waiting, and overproduction. In the context of Lean Six Sigma, waste refers to any

process or activity that consumes resources (such as money, time, or materials), but does not add any value to the product or service that is being produced. Through the elimination of wastes, lean aims to improve the overall process flow and enhance customer value.

Some examples of Lean Manufacturing in action include:

- Quicker response times
- Improving assembly line efficiency
- Reducing patient wait times
- Improving quality
- Reducing inventory
- Streamlining production

Estimated Time	10 minutes
Topic Objective	To define the methodology of Lean, and gain an understanding of how it can be used in action.
Topic Summary	The goal of lean is to identify, as well as eradicate waste in business processes, such as unnecessary motion, waiting, and overproduction.
Materials Required	Worksheet 1: Lean Principles in Practice
Planning Checklist	Provide enough worksheet printouts for all participants.
Recommended Activity	Have participants complete Worksheet 1: Lean Principles in Practice.

	Discuss worksheet responses.
Stories to Share	Share any personal, relevant stories.
Delivery Tips	Encourage everyone to participate.
Review Questions	What is an example of Lean Manufacturing in action?

The History



Lean Six Sigma has its roots in the integration of two methodologies, which were developed separately and combined in the 1990s, to create a comprehensive approach to process improvement. Lean Manufacturing, also known as the Toyota Production System (TPS) was developed in Japan in the 1950s. During this time, Japan had been struggling to rebuild its economy after World War II, and was facing many resource constraints. Toyota engineer, Taiichi Ohno, addressed this challenge by developing a production system that

was focused on reducing waste and maximizing efficiency. Ohno's approach was based on two important principles. The first principle was "Just-in-Time" (JIT), which involves producing and delivering products when they are needed with the right quantity, and at the correct time. The other key principle of Lean Manufacturing is the principle of Kaizen, which means continuous improvement. Kaizen involves a systematic approach to identifying and eliminating waste in the production process, from design to delivery.

Six Sigma was later developed at Motorola in the 1980s by engineers Bill Smith and Mikel Harry. Smith and Harry had recognized the need for a new approach to improving quality and reducing defects in the company's products and services. In the 1990s, General Electric was the first company to adopt Six Sigma as a core business strategy, under the leadership of CEO Jack Welch. As a result of the success with General Electric's implementation of Six Sigma, it had become popularized and led to widespread adoption across various industries.

While many of the early proponents of Six Sigma were from technology and manufacturing industries, it later spread to pharmaceuticals, the military, financial institutes, and various other sectors. The idea of combining Lean and Six Sigma into a single framework, known as Lean Six Sigma, emerged in the 1990s. Many organizations, such as Allied Signal (now Honeywell) recognized the potential benefits of integrating the two methodologies.

Estimated Time	7 minutes

Topic Objective	To reflect on the history of Lean Six Sigma and how it has grown over the years.
Topic Summary	Lean Six Sigma has its roots in the integration of two methodologies, which were developed separately and combined in the 1990s, to create a comprehensive approach to process improvement.
Materials Required	Flipchart/board, markers
Planning Checklist	None
Recommended Activity	Have participants discuss what the future of Lean Six Sigma looks like. Are there any emerging trends or new developments that are likely to impact the methodology in the coming years? Write these responses on the flipchart/board.
Stories to Share	Share any personal, relevant stories.
Delivery Tips	Encourage everyone to participate.
Review Questions	When was Lean Manufacturing developed? When was Six Sigma developed?

Elements of Lean Six Sigma



Businesses across the globe are using Lean Six Sigma to optimize their operations, minimize waste, and achieve sustainable growth. The success of Lean Six Sigma is dependent on three key elements, mindset and culture, tools and techniques, and process and methodology. The first key element, mindset and culture, is the focus of creating a culture of continuous improvement and achieving operational performance goals. This means that all employees are encouraged to identify and eliminate waste, while being empowered to make changes in order to improve the overall process. It may require a shift in one's

mindset to ensure that it is one of collaboration and problem-solving. The second element, tools and techniques, refers to the collection of methods and tools that are used to both identify and eliminate waste, reduce variation, as well as improve overall quality. Some of these tools include value stream mapping, root cause analysis, and process mapping. The third element of Lean Six Sigma, process and methodology, involves the use of a structured approach to identify the root cause and solution to the project's hindrance.

Each of these elements correspond with one another to improve an organization's operations efficiency. By incorporating all three key elements, Lean Six Sigma will help drive an organization towards significant improvements in quality and customer satisfaction.

Estimated Time	10 minutes
Topic Objective	To identify the three key elements that bring success to Lean Six Sigma.
Topic Summary	The success of Lean Six Sigma is dependent on three key elements, mindset and culture, tools and techniques, and process and methodology.
Materials Required	Worksheet 2: The Lean-o-Meter
Planning Checklist	Provide enough worksheet printouts for all participants.
Recommended Activity	Have participants complete Worksheet 2: The Lean-o-Meter. Allow time to discuss worksheet responses.
Stories to Share	Share any personal, relevant stories.
Delivery Tips	This activity is personal- participants may not wish to share their experiences.
Review Questions	What are the three elements of Lean Six Sigma?

Who Needs Lean Six Sigma?



Lean Six Sigma will help to drive powerful results for all types of businesses-regardless of the industry or size. While it is particularly well-suited for organizations that have complex processes or high levels of variability, the skills and knowledge gained through learning Lean Six Sigma are beneficial for any organization that seeks to improve its operational efficiency, increase customer satisfaction, or reduce waste. Some common examples of industries that use Lean Six Sigma include manufacturing, finance, healthcare, as well as service

industries such as transportation and hospitality. This methodology can be applied to any process, from development and product design, to customer service and support.

More specifically, examples of those who can benefit from learning Lean Six Sigma include:

- Business professionals (executives, managers, and analysts)
- Quality control professionals
- Healthcare professionals
- IT professionals
- Project managers
- Engineers

Estimated Time	7 minutes
Topic Objective	To determine the key industries, business functions, and job roles that can benefit from Lean Six Sigma.
Topic Summary	Lean Six Sigma will help to drive powerful results for all types of businesses- regardless of the industry or size.
Materials Required	Flipchart/board, markers
Planning Checklist	None
Recommended Activity	Have participants discuss some common challenges that businesses in different industries face, and how Lean Six Sigma can be adapted to fit the unique needs and processes of different industries. Write these responses on the flipchart/board.
Stories to Share	The healthcare industry is one of the fastest-growing adopters of Lean Six Sigma, with many hospitals and healthcare organizations reporting significant improvements in patient safety, quality of care, and financial performance. (Healthcare Financial Management Association)
Delivery Tips	Encourage everyone to participate.
Review Questions	What are some examples of industries that use Lean Six Sigma?

Practical Illustration



At a printing company, Jean was facing a significant challenge. She noticed a high rate of errors in the product process with the final products, causing delays in production. In turn, this was leading to customer complaints and increased costs for the company. Jean knew that if the company did not address these issues, it could potentially lead to a loss of business and a negative reputation of their industry. She decided to take initiative by studying the production process to identify the root cause. After realization that she

could not fix these problems alone, Jean knew she needed a more comprehensive solution.

Through research and collaboration with her team, Jean discovered the Lean Six Sigma methodology. She began implementing these principles into the company's production process. As a result, they were able to eliminate many unnecessary steps, reduce wait times, and also introduce quality checks to improve their efficiency and reduce errors. The company's production process soon became more streamlined, and they were able to meet deadlines and deliver high-quality products to their customers. Jean's dedication, along with the power of Lean Six Sigma had proved to be a gamechanger for the printing company, and they were able to overcome the challenges they had been facing.

Module Two: Review Questions

- 1) Which company was the first to develop Six Sigma?
 - a) Amazon
 - b) General Electric
 - c) Ford
 - d) Motorola

Since it was first developed by Motorola in the 1980s, Six Sigma has become widely adopted by many of the world's leading corporations and Fortune 500 companies, including Ford, Amazon, and General Electric.

- 2) What is the goal of Six Sigma?
 - a) To achieve a level of process performance in which the defect rate is less than 6 defects per million opportunities
 - b) To achieve a level of process performance in which the defect rate is less than 3.4 defects per million opportunities
 - c) To achieve a level of process performance in which the defect rate is less than 1 defect per million opportunities
 - d) To achieve a level of process performance in which the defect rate is less than 5 defects per million opportunities

The goal of Six Sigma is to achieve a level of process performance in which the defect rate is less than 3.4 defects per million opportunities (DPMO).

- 3) What does the sigma level represent in Six Sigma?
 - a) The average number of defects in a process
 - b) The accuracy rate of a process
 - c) The standard deviation of a process
 - d) The number of opportunities for defects in a process

Sigma refers to a statistical term representing the standard deviation of a process.

- 4) What is the goal of lean methodology?
 - a) To minimize value
 - b) To maximize resources
 - c) To minimize resources
 - d) To maximize value while minimizing resources

In essence, lean is about doing more with less, or rather maximizing value while minimizing resources.

- 5) What is the definition of waste in Lean Six Sigma?
 - a) Any process or activity that adds value to the product or service being produced
 - b) Any process or activity that consumers resources, such as time, money, or materials, and adds value to the product or service being produced
 - c) Any process or activity that consumers resources, such as time, money, or materials, but does not add value to the product or service being produced
 - d) Any process of activity that adds value to the product or service being produced, but consumers resources

In the context of Lean Six Sigma, waste refers to any process or activity that consumes resources (such as money, time, or materials), but does not add any value to the product or service that is being produced.

- 6) What is Lean Manufacturing also known as?
 - a) Toyota Production System
 - b) Motorola Production System
 - c) Kaizen
 - d) Six Sigma

Lean Manufacturing, also known as the Toyota Production System (TPS) was developed in Japan in the 1950s.

- 7) What does Kaizen mean?
 - a) Eliminating waste
 - b) Continuous improvement
 - c) Maximizing efficiency
 - d) Improving quality

A key principle of Lean Manufacturing is the principle of Kaizen, which means continuous improvement.

- 8) The idea of combining Lean and Six Sigma into a single framework, known as Lean Six Sigma, emerged in the early 2000s.
 - a) True
 - b) False

False- The idea of combining Lean and Six Sigma into a single framework, known as Lean Six Sigma, emerged in the 1990s.

- 9) Which of the following is *not* one of the three key elements of Lean Six Sigma?
 - a) Mindset and culture
 - b) Tools and techniques
 - c) Marketing and advertising
 - d) Process and methodology

The success of Lean Six Sigma is dependent on three key elements, mindset and culture, tools and techniques, and process and methodology.

- 10) What is the main goal of using Lean Six Sigma in businesses?
 - a) To improve operational efficiency
 - b) To increase waste
 - c) To decrease customer satisfaction
 - d) To increase variability

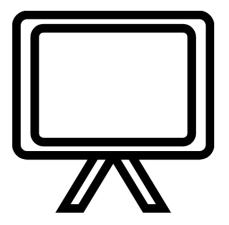
The skills and knowledge gained through learning Lean Six Sigma are beneficial for any organization that seeks to improve its operational efficiency, increase customer satisfaction, or reduce waste.

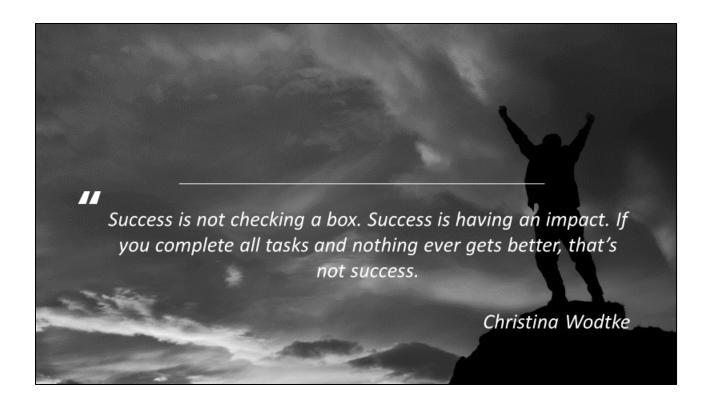
PowerPoint Slides



Below you will find the PowerPoint sample. The slides are based on and created from the Instructor Guide.

PowerPoint slides are a great tool to use during the facilitation of the material; they help to focus on the important points of information presented during the training.

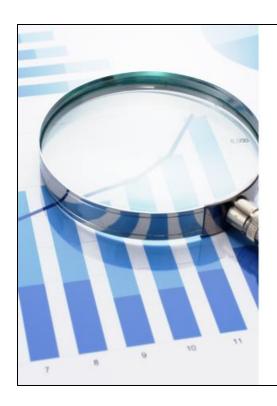




MODULE TWO

Introduction to Lean Six Sigma

Organizations must continually strive to improve their processes in order to remain relevant, successful, and meet their customer needs.



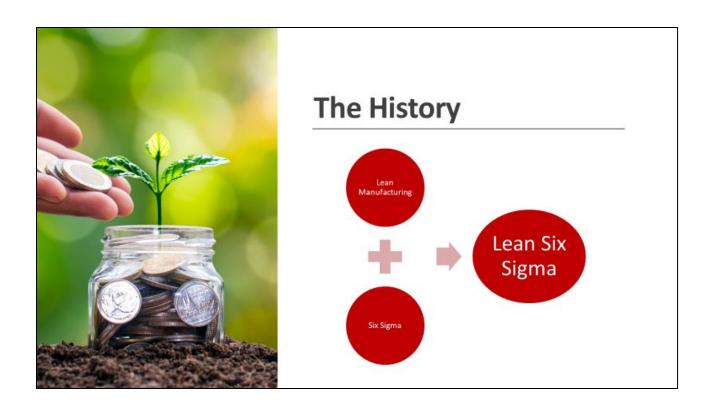
What is Six Sigma?

Six Sigma uses statistical analysis and other tools to reduce defects and variability in a process to achieve a level of quality that will meet or exceed customer expectations.

What is Lean?

- Quicker response times
- Improving assembly line efficiency
- Reducing patient wait times





Elements of Lean Six Sigma

The success of Lean Six Sigma is dependent on three key elements, mindset and culture, tools and techniques, and process and methodology.





Who Needs Lean Six Sigma?

Lean Six Sigma will help to drive powerful results for all types of businesses- regardless of the industry or size.

Practical Illustration



- What is Six Sigma?
- What is Lean?
- The History
- Elements of Lean Six Sigma
- Who Needs Lean Six Sigma?

Module Two: Review	v Questions
1. Which company was th	e first to develop Six Sigma?
A. Amazon	B. General Electric
C. Ford	D. Motorola

Quick Reference Sheets



Below is an example of our Quick Reference Sheets. They are used to provide the participants with a quick way to reference the material after the course has been completed. They can be customized by the trainer to provide the material deemed the most important. They are a way the participants can look back and reference the material at a later date.

They are also very useful as a take-away from the workshop when branded. When a participant leaves with a Quick Reference Sheet it provides a great way to promote future

business.



Lean Six Sigma Quick Reference Sheet



What is Six Sigma?

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The Principles of Lean Manufacturing

Lean Manufacturing empowers organizations to achieve peak efficiency through five core principles: Value, Value Stream, Flow, Pull, and Perfection. James P. Womack and Daniel T. Jones, well-known figures in the field of Lean Manufacturing, are known for popularizing Lean Manufacturing and defining these five principles in their book, "The Machine That Changed the World". These principles provide a framework for organizations to maximize efficiency, while also creating the most amount of value for their customers. Whether it is for a specific product, or an entire assembly line, Lean concepts can help manufacturers to strive for continuous improvement. Ultimately, applying these Lean principles will help organizations to streamline their operations, enhance customer value, and achieve sustainable improvements in performance.

The Lean Manufacturing principles:

Value



Value Stream



Flow



Pull



Perfection



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DMAIC

Lean Six Sigma uses two different frameworks to provide a structured process for improvement: DMAIC and DMADV. The DMAIC technique is a problem-solving process that is used to improve an *existing* process. It consists of five phases, including Define, Measure, Analyze, Improve and Control. DMAIC is reactive, focusing on identifying and eliminating the root causes of problems. This can be particularly useful when a process is not meeting its performance expectations, or when organizations need to achieve significant improvements in quality and effectiveness. Each phase of DMAIC is critical to ensuring a successful process improvement project, from defining the problem, to controlling the solution.



Value Stream Mapping

Value Stream Mapping (VSM), also known as Lean Process Mapping or Value Stream Analysis, is a very valuable tool used in Lean Six Sigma. This tool is used to visualize and analyze the flow of materials and information required to produce a product or service. Value stream mapping starts with creating a detailed map or diagram of the entire value system, from the customer's order to the delivery of the product or service. This map should include all of the activities, resources, and information that are required to complete the process, including transportation, inventory, suppliers, and lead times. Once this map has been created, the team can analyze the current map and identify ways to improve the process. With the areas for improvement identified, the team will then conduct a future state map that includes all of the changes and improvements that are planned. The future state map is intended to show the ideal state of the value stream after improvements would be implemented. This can include changes with the elimination of waste, reduction of lead times, and increased efficiency. This map is an essential part of the value stream process, as it helps to identify the steps required to actually make these changes happen.

Business Advantages

Lean six sigma has been widely adopted by businesses around the world, due to its proven ability to reduce costs, drive process improvements, and foster a culture of continuous improvement. This methodology not only brings value to businesses through improving efficiency and quality, but also to customers by aligning process improvements with their requirements, resulting in an increase in overall customer satisfaction and loyalty. This holds significant importance for creating a positive brand reputation, as well as a competitive edge in the market. Additionally, Lean Six Sigma will also provide value to employees, by involving them at all levels of the organization in process improvement efforts, leading to increased engagement and empowerment. Implementing this methodology can bring about numerous benefits to any business looking to reach operational excellence.

These business advantages include:

- Error Reduction
- Increased Revenue
- Reduced Costs
- Customer Loyalty
- Employee and Team Development



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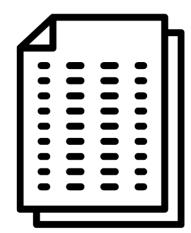
Handouts



Each course is provided with a wide range of worksheets.

Worksheets help check your participants' understanding. If a lesson calls for a worksheet, it will be listed in the Lesson Plan box under Materials Required. All worksheets are customizable and can be found in the Appendix of the Instructor Guide and the Training Manual.

As a trainer, icebreakers give your participants the opportunity to get to know each other better or simply begin the training session on a positive note. Icebreakers promote collaboration, increase engagement, and make your training more lighthearted and fun. Below is an example from the Icebreakers folder.



industries?

Lean Principles in Practice

Analyze the following case study. A food processing plant was facing issues with excess inventory, long lead times, and low productivity. The plant decided to implement Lean Manufacturing principles to address these issues and improve their operations. The first step the plant took was to analyze their production process and identify areas of waste, such as overproduction, excess inventory, and waiting time. They then implemented a pull system, where products were only produced in response to customer demand. The plant also implemented a continuous improvement program, where employees were encouraged to identify and suggest improvements to the production process. As a result of these changes, the plant was able to reduce their inventory levels by 40%, reduce lead times by 25%, and increase productivity by 20%. They were also able to improve product quality by implementing a rigorous inspection process and training employees on quality standards.

Questions for Consideration:
How does a continuous improvement program help to drive improvement and innovation in a production process?
2. What were the challenges the manufacturing company faced before implementing Lean Manufacturing principles? How did these challenges impact the company's operations and profitability?
3. How did the food processing plant measure the success of their Lean Manufacturing implementation?
4. How can Lean manufacturing principles be applied to other industries, such as healthcare or service

Icebreaker: Process Improvement Challenge

PURPOSE

To introduce participants to the concept of process improvement and the basic principles of Lean Six Sigma.

MATERIALS REQUIRED

- Index cards
- Pens/pencils

PREPARATION

Create a list of common processes or activities that could benefit from process improvement (e.g, making coffee, ordering food, assembling a product, filing documents, conducting a meeting/interview). Write each process on an index card and shuffle the cards. Set up tables and chairs in a way that allows for small groups of 3-5 people to work together.

ACTIVITY

Explain to the group that they will be playing a game related to process improvement. Distribute the index cards to each group and ask them to choose one card from the deck. Ask the participants to identify the steps involved in the process or activity listed on the card. Once each group has identified the steps, ask them to brainstorm ways to eliminate waste or inefficiencies in the process. Give the group 10-15 minutes to discuss and write down their ideas, encouraging them to think creatively. As a group, discuss the similarities and differences between the ideas generated, and encourage participants to ask questions and provide feedback. Finally, wrap up the activity by highlighting the key principles of Lean Six Sigma and how they relate to the activity.

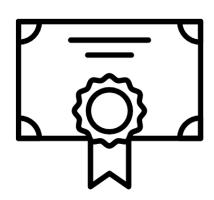
Note

To adapt this icebreaker for virtual training, randomly assign participants to breakout rooms. Prepare a list of common processes and upload them onto virtual cards or slides on the platform. Encourage participants to identify the steps involved in the process/activity and brainstorm ways to eliminate waste or inefficiencies in the process, and record their ideas on a shared document or virtual whiteboard. After the small group discussions, bring everyone back together for a larger group discussion.

Certificate of Completion



Every course comes with a Certificate of Completion where the participants can be recognized for completing the course. It provides a record of their attendance and to be recognized for their participation in the workshop.



CERTIFICATE OF COMPLETION

SOR

72057

[Name]

Has mastered the course **Lean Six Sigma**

SIR

Awarded this

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Presenter Name and Title