

Designing Executive Management Training Programmes to Mitigate COVID-19 Challenges

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Abstract

The COVID-19 pandemic has prompted companies to operate in innovative ways to tackle supply chain disruptions, swings in customer demand, and health risks to the workforce. The capability of companies to respond to contingencies and meet different needs is crucial for business leaders in continuing business. This paper proposes that Lean principles can be the basis for successful business transformation. We feature an executive-level training programme based on lean principles for enabling business transformation to support business leaders in recalibrating their business operations to tackle the challenges caused by the COVID-19 pandemic. The study uses Bloom's taxonomy in lesson planning and course design to meet the desired learning outcomes. This paper provides practical advice for course designers and programme leaders on integrating Bloom's taxonomy as the basis for designing Lean training and educational content to suit the adult learners' needs.

Keywords: Business Transformation; Bloom's Taxonomy; COVID-19; Lean Principles; Lean Education Framework

1. Introduction: COVID-19 disruptions to businesses

Since 2020, COVID-19 affected nearly all countries and humanity has experienced an unprecedented health crisis generated by the pandemic. Beyond the health crisis of the COVID-19, the pandemic also poses significant threats to business survival and triggered serious economic turmoil. Across the globe, the pandemic has had an impact on every industry, including small enterprises and major corporations. The COVID-19 pandemic has prompted many companies to respond quickly to supply chain disruptions, changing customer demand, as well as occupational health and safety.

With social distancing policies and repetitive national lockdowns, some businesses have come to a halt. However, the COVID-19 crisis has also accelerated several transformation namely digitalisation and operational agility (Alicke et al., 2021; Ivanov, 2021; Varadarajan et al., 2021). Most businesses, especially for those which have not experienced severe shutdowns, have adopted remote working as their default mode of operation. According to a McKinsey survey of global supply chain leaders, over 90 percent of companies planned to improve supply-chain resilience, such as increases in the inventory of critical products and diversify supply bases (Alicke et al., 2021).

This paper proposes that Lean principles can be the basis for successful business transformation. We showcase an executive training programme's design and teaching experience for "*Enterprise Transformation using Lean*". The training programme's objective is to support business leaders in evaluating and recalibrating their businesses operations so as to prepare response strategies to face the uncertainties and challenges in the macro-environment.

2. Operational Excellence and Lean Management in COVID-19 Era

With globalisation, e-commerce, and rapid advances in technology, suppliers, manufacturers, and customers can be located anywhere in the world. Before the COVID-19 pandemic, the focus of global supply chains was to source materials and components at the lowest cost, produce or assemble the goods in a cost-effective manner, and then deliver them to customers efficiently. Since the Covid-19 pandemic, resilience building and risk management seem to attract greater limelight in the business and supply chain management space (Alicke, et al., 2021).

The health crisis has unravelled every facet of human life and disrupted many supply chains in unprecedented ways. Restrictions imposed by many governments to stem the spread of the outbreak have caused supply disruptions, labour shortages and economic hardship. The mismatch between the supply and demand of goods and services has never been so severe. As the rate of vaccination increases, restrictions have cautiously been lifted and businesses have gradually reopened. However, many of them need to re-think and re-configure their operating model and supply chains to meet the evolving market needs.

Operational Excellence (OpEx) can be seen as part of strategic management in the business transformation journey to steer the organisations towards a new form of effective and efficient Operandi status. Operational Excellence (OpEx) originated from strategic management, which supports an organisation applying scientific methods to achieve excellence in its operations (e.g. Porter, 1980). OpEx was subsequently adapted and extended by others (e.g. Treacy and Wiersema, 1993)

The scientific method to achieve OpEx gave rise to process improvement methodologies such as Lean management and Six Sigma methodology, which enable organisations to measure facts to understand causes and effects. These insights allow organisation leaders and employees to continuously steer their operations to improve quality and yields while reducing waste and cycle time (Alicke et al., 2021; Ivanov, 2021; Varadarajan et al., 2021).

3. Lean Management

Lean management is a well-established approach leading corporations to Operational Excellence (Monden, 1998; Murman et al., 2002). The application of Lean principles that focus on continuous improvement and respect for people to create value and improve efficiency while reducing costs is well documented (Chan and Tay, 2017; Ivanov, 2021; Tay and Aw, 2021; Ohno, 1988; Womack and Jones, 1996; Womack et al., 1990). Over the past four decades, organisations worldwide have attempted to implement Lean principles by applying tools used to execute Lean thinking strategies and replicate the success of Toyota's Production System to achieve enterprise transformation (Ohno, 1988; Stone, 2012; Tay and Low, 2017; Tay and Loh, 2021; Tay, 2021a). Several industry studies have reported that executives from organisations worldwide have found that Lean is a widely deployed improvement methodology (Kanigolla et al., 2014; Salah et al., 2011; Antony and Kumar, 2012).

Applying Lean management within the enterprise requires a complete understanding of *how* and *why* the Lean organisation is operating and performing at its current state. An organisation that has undergone business transformation successful by applying Lean principles has different relationships and priorities than a traditional enterprise. For instance, in a conventional supply chain, purchasing agents will execute orders that take advantage of quantity discounts at the expense of warehousing and excess inventory. In contrast, a Lean supply chain that embodies risk management and resilience-building will seek to develop robust operations and demand-based purchasing.

Increasingly, companies make value proposition and cost management as their priorities to sustain their market performance and business longevity (Varadarajan et al., 2021). Lean management can be the basis for successful enterprise transformation to improve operations responsiveness and efficiency throughout the supply chain by creating value and eliminating waste. As educators, we aim to motivate individuals to progress towards the mastery of Lean tools and have a solid understanding of the Lean principles that can help them in their continuous improvement journey (Tay, 2021b). Therefore, the key question raised in this paper is *“how to design an executive training*

programme to facilitate learning of Lean principles and tools to support a successful enterprise transformation?”

This paper demonstrates our experience in the training programme design and teaching adult learners on Lean management to support them in successfully transforming their business and operations to cope with the impact of the COVID-19 pandemic and market uncertainties. The programme gives participants an appreciation of the impact of the pandemic on business operations and supply chains. Ultimately, the training programme aims to equip participants with Lean theories and tools that enable them to make informed decisions to enhance their business operations and supply chain resilience. In the programme, the participants reflect on the lessons learned from the disruptions caused by the COVID-19 pandemic and explore the strategies, innovative practices and managerial tools to cope with the chronic crisis.

4. A framework for designing the training on “Enterprise Transformation using Lean”

An executive-level training programme is part of lifelong education and adult learning. It is a dynamic area that requires training providers to design training programmes that suit the practical learning needs of working adults. Adult learning pedagogy, also known as Andragogy, was first established by Alexander Kapp in 1833. Kapp established the field of study known as the science of the “lifetime” education/learning of adults (Zmeyov, 1998). The concept of lifelong education and continual learning corresponds to the core of the Lean management, a problem-centric approach which involve scientifically analysing and solving problems, learning from the experience, and translating knowledge to others (Singh, 2019; Tay, 2021b; Tay and Low 2017).

According to Malcolm Knowles’s model of adult learning, adults and children learn differently: for instance, adults are more self-directed, internally driven, and eager to learn (Smith, 2002). Unlike children, adults are more goal-oriented and they need to understand why they are learning something. Hence, to effectively engage adult learners, educators need to take account of the following considerations:

- adults are self-directed;
- adults builds their learning based on their past experiences and these experiences often complement academic studies;
- adults are keen to learn something that is relevant to their current situation and less on something which might not have any future use;
- adults are more likely to learn if they are given a problem that needs to be addressed.

In practice, Lean education follows a carefully documented process that promotes continuous improvement and exhibits a dedication to the never-ending effort to learn and share knowledge (Iver et. al, 2009). As a form of applied knowledge and skills, Lean management principles should be taught based on a comprehensive theoretical understanding with ample practice opportunities to achieve practical learning outcomes. However, many Lean training programmes seem to overlook the fundamental Lean principles and concepts necessary for adult learners, resulting in a

less successful transition to Lean (Harris et al., 2014; Tay, 2016; Tay et al., 2017; Tay, 2021b).

In our case, we seek to equip adult learners with knowledge of relevant Lean theories and skill sets to support their business transformation journey. Our approach engages learners in problem solving and making quality improvements which are consistent with Bloom's Taxonomy. In addition, the learners should be made aware the relevance of the training courses besides addressing their immediate needs. It is essential to avoid creating circumstances in which individuals are implementing tools without fully comprehending the foundation or acquiring prerequisite knowledge required for successful implementation.

We illustrate how learning about Lean management can aid practitioners to successfully steer the companies to new forms of working and business processes transformations through understanding Lean theories and hands-on applications of Lean tools in familiar contexts that the learners can relate to.

5. Bloom's Taxonomy: A Model for Lean Management Education for Enterprise Transformation

Bloom's (1956) taxonomy of educational objectives is used across disciplines when designing educational materials for over 50 years to support the study and practice of the learning process. The bloom taxonomy was revised in the 1990s to improve its ease of use and relevance (Anderson and Krathwohl, 2001).

One of the fundamental tenets of the revised Bloom's taxonomy is the order in which learning should occur. It suggests a hierarchy of thinking and acquiring new skills best suited for the cognitive domain, as shown in Table 2. The tendency to assume learners have the prerequisite knowledge (remembering and understanding) and proceed directly into the higher-order thinking skills without first assessing the learner's current state of understanding is common in academia and practice.

Using the Bloom's taxonomy to structure learning content ensures that the lower-order skills or thinking (levels 1, 2 and 3) occur before the higher-order skills (levels 4, 5 and 6). This systematic way of building knowledge allows the learners to build a foundation of remembering, understanding, and applying before analysing, evaluating, and creating new information and skills.

We propose an applied Bloom's taxonomy for the enterprise transformation using Lean training programme, which aligns the essential learning objectives of Lean management principles and skill sets with the revised Bloom's taxonomy, as shown in Table 1. The applied Bloom's taxonomy for the executives training programme provides scholars and practitioners with a simple guide when designing, delivering, and evaluating Lean interventions.

Table 1: Applied Bloom's Taxonomy for the Enterprise Transformation using Lean Training

Bloom's Taxonomy	Definition for Enterprise Transformation using Lean Training Programme
1. Remembering	<p>The learner has heard of Lean, may learned about Lean through a course or workshop.</p> <p>The learner attempts to apply some of the essential tools.</p>
2. Understanding	<p>The learner is introduced to Lean principles.</p> <p>The learner is taught about the tools; and he or she knows <i>how</i> to use the tools correctly, but not necessarily <i>why, when, or who</i> will utilise them.</p>
3. Applying	<p>The learner is familiar with the Lean system and its tools, and can recognise when to use them.</p> <p>The learner also understands how to use the tool while observing symptoms of which he or she is aware.</p>
4. Analysing	<p>The learner holds Lean principles as core beliefs that influence his or her thinking.</p> <p>The learner knows and understands the tools and when they should be used, but also the why behind the effort, seeking out wastes in all of their forms as part of his or her core belief.</p> <p>The learner understands that value is the ultimate goal and is constantly seeking the path to get there; this is what is known as intrinsic motivation.</p>
5 and 6. Evaluating and Creating	<p>The Lean thinker has matured into a "lean champion" who can succinctly and clearly explain the vision of a lean enterprise to others, seeing beyond the value stream mapping (VSM) generated action item list of discrete improvement events to the aim of continuous improvement through all activities every day.</p>

Adapted from: Harris et al. (2014: 197)

6. Context: Training Programme on “Enterprise Transformation using Lean”

Aligning the Training Programme with Adult Learning Theory

Lean philosophy focuses on eliminating waste throughout the value stream (Liker, 1997; Shah and Ward, 2007; Tay et al., 2017; Tay, 2021b). In the book titled “The Machine that Changed World”, Lean is described as a process optimisation guided by a set of principles and best practises with the goal of continuous improvement (Womack et al., 1990). Womack and Jones (1996) further expound the five essential elements of Lean philosophy, which include:

- Specify the *value* for each product with precision
- Determine each product's *value stream*

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- Allow value to *flow* uninterrupted
- Allow the consumer to *pull* value for the producer
- Strive for *perfection*

These five key elements proposed by Womack and Jones (1996) revolve around purpose, people, and process. Lean organisations strive for continuous improvement by responding to operational challenges (e.g., waste) in an efficient manner through a problem-centric approach, where problem-solvers scientifically examine and resolve the problems (Liker, 1997; Shah and Ward 2007; Tay and Low, 2017). These problem-solvers are often self-directed, although there are cases where autonomous teams look to a facilitator for assistance as required. Such self-directedness and autonomy in learning align well with the Knowles's adult learning model (Smith, 2002).

The Enterprise Transformation using Lean training programme aims to equip business leaders and managers who want to drive improvements and transformations within their organisations with the relevant theories and skill sets based on the Lean management principles. We have outlined the learning outcomes, in which the participants could achieve at the end of the training programme, as shown in Table 2.

Table 2: Learning Outcomes of the Enterprise Transformation using Lean Programme

Theoretical Knowledge and Understanding	Practical Skills
Explain the key concepts in operations and supply chain and how these concepts can be integrated into an organisation's overall business strategy.	Relate Operations and Supply Chain Management concepts and frameworks to their work environment.
Understand the relation between supply management, value-creation and demand fulfilment.	Apply business excellence techniques/ tools to manage their operations
Discuss the issues and strategies in managing the supply chain processes for products and services.	

We propose a training framework for the "Enterprise Transformation using Lean" programme that begins with a foundational knowledge of basic operations and supply chain management and a clearly defined business transformation goal for the organisation, as shown in Table 3. The framework incorporates the relevant topics covered in the training content, learning activities, the desired learning order for each learning activity and the instructional format.

Table 3: A Framework for “Enterprise Transformation using Lean” Training Programme

Topics and Description	Bloom’s Taxonomy	Learning Activities	Instructional Format
<p>1. Introduction</p> <p>2. Overview of Operations and Supply Chain Management (OSCM)</p> <ul style="list-style-type: none"> • Operations strategy framework and the critical decision loops that link corporate and marketing strategies with operations strategy • The Supply Chain Operations Reference (SCOR) Model • The key trends that have impacted businesses – drawing based on prior knowledge and experience <p>3. Why is innovation essential for a post-COVID-19 world?</p> <ul style="list-style-type: none"> • The impacts of the Covid-19 pandemic and how businesses and supply chains are coping • The case for operational excellence, innovative thinking and relevance of technology applications • The landscape of the digital economy - how can businesses leverage Industry 4.0 technologies and digitalisation 	<p>Understand</p> <p>Remember</p> <p>Understand</p> <p>Apply</p> <p>Analyse</p> <p>Evaluate</p>	<p>Peer-sharing among participants</p> <p>Lecture on the main tenets of OSCM and Lean principles</p> <p>Case study discussions</p> <p>Mentimeter online poll to assess prior knowledge and evaluate learning</p> <p>Peer-sharing on practical experience</p> <p>Case study discussion</p> <p>Mentimeter online poll questions to facilitate topical discussions</p> <p>Peer-sharing on case findings</p>	<p>Face-to-face Seminar</p> <p>Face-to-face Seminar</p>
<p>4. Enhancing Operations and Supply Chain Resilience for a Post-Crisis World</p> <ul style="list-style-type: none"> • Lean thinking – from silo operations view to integrated supply chain view • Value stream mapping – recognising waste in the current value chain and driving continual improvements with Kaizen events • Supply chain risk management and mitigation strategies - a framework for risk prioritisation and mitigation 	<p>Understand</p> <p>Apply</p> <p>Analyse</p> <p>Evaluate</p>	<p>Lecture on Lean theory</p> <p>Case study discussion</p> <p>Peer-sharing on case findings</p>	<p>Face-to-face Seminar</p>

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Topics and Description	Bloom's Taxonomy	Learning Activities	Instructional Format
<p>5. Impact of Covid-19 Pandemic on Operations and the Supply Chain</p> <p>Insights on how supply chains have adapted to sudden pivots during the pandemic, e.g.</p> <ul style="list-style-type: none"> • changes to sales models • drastic changes in customer behaviour • new offerings • new competitors <p>Discussion questions:</p> <ul style="list-style-type: none"> • How has operations/supply chain responded? • What can be done to prepare for post-crisis operations? • What would you do differently if you could go back in time? • Will things revert to normal? What is the new normal? • Where do we go from here? 	<p>Apply</p> <p>Analyse</p> <p>Evaluate</p> <p>Create</p>	<p>Class participations and Q&A session with invited Panellists</p>	<p>Hybrid mode: Face-to-face and Zoom virtual meeting based on the availability of panellists</p>
<p>6. Reflections and concluding remarks</p>	<p>Evaluate</p> <p>Create</p>	<p>Final report preparations</p>	<p>Assessment to be prepared outside of the seminar contact hours</p>

The instructional activities for the course are designed based on the applied Bloom's Taxonomy for Enterprise Transformation Using Lean Programme (Table. 3). The learning activities are relevant and applicable to real life situation in order to promote student engagement and also deeper learning. Examples of learning activities include polls (using Mentimeter), peer discussions, group-based discussions, and presentations. Generally, the training programme has the following delivery format:

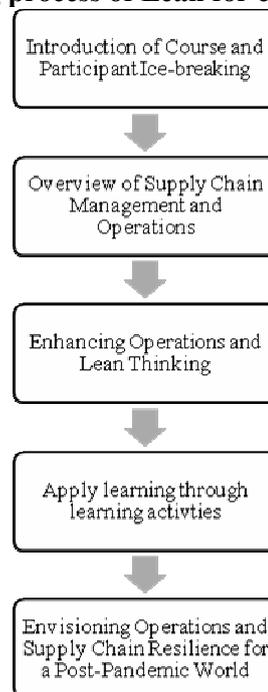
1. Introduction of new topic via lecture, including recorded lecture and face-to-face lecture
2. Evaluation of participants' prior knowledge using Mentimeter (live poll)
3. Application of theoretical understanding via reflection, group discussion or case study discussions.

First, the concept of operations and supply chain strategy is introduced. The relationship between various stakeholders is discussed in class, and sometime use specific business contexts that are relevant to the learners. The participants are time and opportunities to connect their past experiences and newly acquired knowledge by using process mapping and value stream mapping (VSM) before summarising and

reporting it in their reports. The primary focus is on understanding the value of Lean and its relevance to the internal and external operations of the business. The participants perform process analyses to *identify opportunities for improvement*. This step concludes the application phase of the course. Another critical aspect of the programme is the importance of *people* in the improvement and business transformation *processes*. A comprehensive review of the role of different stakeholders in all aspects of Lean, starting from the problem statement and business case drafting to the change management process, is thoroughly reviewed and summarised. At the end of the programme, the participants must submit a final report as a part of their assessment and they are required to synthesise what they learned throughout the course actionable business plans for enterprise transformation.

The participants went through a step-wise learning process as shown in Figure 1:

Figure 1: A step-wise learning process of Lean for enterprise transformation



Since most working adults do not have much time outside of their work and family commitments, learning is planned as synchronous learning during contact hours in the physical seminar room. In addition to the final report that the participants need to write outside the contact hours, all the other learning activities are carried out in the physical seminar room. Table 4 outlines the details of the learning activities, which include the objectives, learning modes, active learning strategies used and the physical seminar room set up and resources support.

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Table 4: Active learning strategies used in the “Enterprise Transformation using Lean” Programme

Objective	Learning mode	Active learning activities	Set up of seminar room and resources
Encourage active engagement	Synchronous	Small-group Discussions on a case study	Form learners into small groups of 3-5 students.
	Collaborative learning and feedback		Pose questions relating to the case study to solicit active discussions.
Review understanding	Synchronous	Online Poll Using Mentimeter	Use an online polling feature and share results with the class.
	Individual learning and feedback		
Reflect on learning	Synchronous	Set up an ‘Aha’ wall	Ask students to put their ideas up using post-it notes.
	Individual learning and feedback	Ask students to post an “aha” moment real-time in class using post-it notes	Place the post-it notes on poster boards on the wall
Strengthen understanding	Synchronous	Collaboratively create a pro/con list using a collaborative Google document in real-time or on a shared screen	Generate a pro/con list using collaborative tool, Google docs.
	Collaborative learning and feedback		
Engage active learning	Synchronous	Process mapping and value stream mapping to engage learners in synthesising and connecting ideas	Use flipcharts and collaborative online visual mapping tool to illustrate and share in real-time.
	Collaborative learning and feedback		
Providing feedback on work in progress	Asynchronous	Final report drafts	One-to-one consultation hours are made available for every participant
	Individual learning and feedback		

The training programme concludes with reflections and a final report preparation that the participants have to submit at the end of the programme. Additionally, the participants are also assessed by their in-class participation. As the primary aim of the training programme is to aid business leaders in applying Lean for business transformation, we assessed each final report holistically based on the authentic business setting and contextual constraints. In addition, we also offered extensive qualitative feedback in each final report as summative comments to the learning outputs from the training programme.

7. Conclusion and Implications

In the time of Covid-19, companies face enormous challenges navigating the impacts from the pandemic, especially when operating in an unpredictable market and muted economic recovery. Many businesses face pressing issues including slow demand and increased competitiveness, changing consumer behaviour, as well as shortages of labour and raw materials. However, the COVID-19 pandemic also presents opportunities for businesses to transform their businesses and alleviate their workforce to meet changing demands. Companies must move from the perception that “*I will work on a continuous improvement activity if I have time after I finish my work*” to a forward-looking attitude which sees challenges as opportunities for improvements and enterprise development. It is essential to learn and apply the concepts of Lean management and build a solid understanding of the core tenets of Lean for sustaining the transformations in the long run.

This paper integrated Bloom’s taxonomy to design a training programme that seeks to support organisational leaders and managers in successfully manoeuvring the enterprise transformation journey using Lean management principles. We featured an executive training programme design and teaching experience that adopted Lean as the fundamental principles of continuous improvement and teaching tools such as value stream maps and final reports to support organisations’ drives toward continuous improvement and respect for people. We believe that implementing Lean principles within an organisation can fuel a practical and steady enterprise transformation.

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