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## A HOLISTIC MODEL FOR SUSTAINABLE AND INNOVATIVE BUSINESS EMPOWERMENT

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**Abstract:** In a competitive business world, Excellence becomes a necessity. However, the way to achieve and maintain it is countered by problems. This paper aims to develop a holistic, innovative, and sustainable framework for enhancing organizations' competitiveness. Usually, Excellence frameworks focus on developing operational level using different tools as LSS, DFSS, or QFD. This paper attempts to highlight the importance of an innovative strategy to build the ideal business vision before attacking operational level. The case study demonstrates the effectiveness of the methodology. In conclusion, this holistic method should change industrial practices and show the power of TRIZ for creating a winner strategy.

**Key words:** Lean Six Sigma, TRIZ, Holistic framework, Excellence, strategy, sustaining improvement, nine windows.

### 1. INTRODUCTION

Nowadays, organizations need to develop their competitiveness and maximize benefits. To get this objective, it is important to satisfy customers' requirements and adopt a continuous improvement approach [1,2]. Every day, organizations deal with various problems in different areas. Usually, problem solvers use their intuition and their own experiences to solve problems [3]. To be more efficient, organizations need systematic methods to improve themselves continuously [4]. Lean management and Lean Six Sigma have become the most popular and confirmed approaches for improving business [5]. LSS has been defined as a business methodology and strategy that increases process performance, improves process capability, and reduces cost [5]. Motorola, Six Sigma's inventor, has seen its sales and profits increase year after year; In addition, Motorola's cumulative saving based on Six Sigma was 14 billion \$ [6]. However, Motorola, like many other companies, could not predict and resist the market change. It is clear that LSS is powerful for process improvement, but currently, companies need to be innovative, and strategy makers. Dobbing [7] acknowledge that the world of success and

failure in business starts with an idea. Dobbing adds that business success is related to the quality as desired by the customer and the quality of creative ideas generated and implemented. In this perspective, TRIZ has gained a positive reputation for being a powerful idea generator. TRIZ Tools and philosophy help solvers to overcome the mind psychological inertia, to achieve easily and efficiently the ideal solution through contradictions and the 40 Principles [6]. However, TRIZ is still not familiar in most industries and not as popular a methodology as Lean Six Sigma [6]. In addition, TRIZ is used, most of the time, just in the innovation step to generate ideal solutions rather than exploring TRIZ potential [8,9].

This article proposes a holistic framework for a sustainable business. Strategy, Innovation through TRIZ, and LSS are three dimensions we integrate to look at the big picture. The framework objectives are:

- Set an ideal strategy to enhance competitiveness, and to sustain organizations' development.
- Make organizations' staff focus on solving real problems and working on real opportunities according to the strategy and the customer requirement.

- Be efficient and innovative to create the vision and to solve problems.

In this article, we propose to highlight the need for a strategic vision to conduct improvements. Besides, section 2 describes TRIZ's power for a successful strategy and a robust operational level. The case study will demonstrate the framework's effectiveness and limitations. The conclusion presents paper limitations and possible future researches.

**2. BACKGROUND: LEAN SIX SIGMA AND THE NEED FOR A DRIVER STRATEGY AND INNOVATIVE TOOLS:**

LSS is the integration of Lean and Six Sigma. LSS appear in the literature and seminars since the 2000s [5]. The integration allows combining Six Sigma's robustness, and Lean's value focus [10]. Lean takes his name from J. Womack's book "machine that changed the world" [2]. Taiichi Ohno and Shigeo initiated it in TOYOTA Company after the Second World War. The lean objective is to provide value as desired by the customer by eliminating waste continuously [11]. Womack's lean concept requires to solve problems efficiently, to save time, to be reactive, and to provide value at the right place and the right time as required by the customer. Furthermore, Bill Smith developed Six Sigma at Motorola in 1980 as a strategic business improvement [5]. It was created to attack any problems by reducing variation, and getting through improvements [2]. Based on statistical control, Six Sigma can complete the Lean manufacturing gap especially for complex problems [11]. Moreover, LSS focus on Material and information flow between process steps, and value-adding transformation within the process step [5]. In other words, LSS creates value as desired by customers, It shows the better way to satisfy customers.

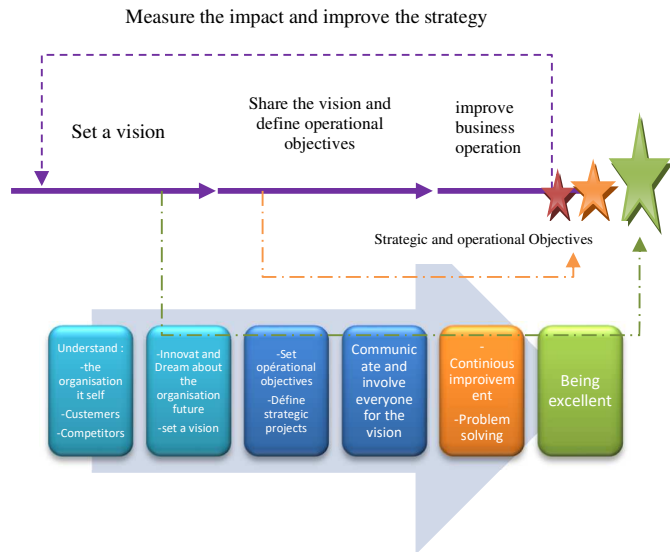
However, if organizations could not attract customers or predicts customers' needs, customers will show a preference toward competitors. Nokia was the leader of telephony mobile for many years, the quality and the price was attractive. Unfortunately, competitors have a technology and innovation advantage. Nokia could not compete against Apple and Samsung. The literature used to consider value as the

higher quality, at the right time, and with the lowest cost [8]. However, nowadays companies leader as Amazon, Google, Facebook, and Apple show that creativity, innovation, and new ideas are necessary to progress. Companies that will prosper in the future are companies that can think outside of the boxes, set a winner strategy, and make the operational level focus on objectives. In this way, organizations spend more time on things that matter, solve real problems, and anticipate the future.

We conclude that companies need a holistic improvement to generate competitive strategy, to share the winner vision before defining operational objectives and projects. Ohler [12] mentioned that it is time to stop dissociating strategy and execution. He used a road-map with three steps which are:

- Creating strategy
- Planning strategy,
- Executing strategy.

This study needs to add a control step to measure the strategy impact step.



**Fig.1.**The way for excellence starts with an innovative strategy

Authors resume the way for excellence, in figure1. We propose four steps to get excellence:

- Set a vision
- Share the vision and define operational objectives
- Improve business operations
- Measure the impact and improve the strategy

First, organizations must understand the main drivers to work the best. They have to learn more about their strengths and weaknesses through listening to their stakeholders, especially customers and employees. Then, they need to define their customers and recognize what makes them partners for a long time. Finally, identify their competitor's strengths and weaknesses.

Dealing with those parameters, organizations will define the ideal result as a long-term vision and compile, before competitors, short and medium strategic objectives.

Moreover, those who will execute the strategy, must know the vision, understand it and participate to construct the operational objectives.

At the operational level, LSS is an ideal approach to lead projects and surmount problems. However, improvement systems must be robust enough to reach strategic objectives. Integration of TRIZ to stimulate creativity is required. The question is how TRIZ could enhance the framework efficiency.

## 2. METHODOLOGY:

### 2.1 The need for TRIZ to stimulate creativity and new ideas for a winner strategy

Altshuller observe that technical systems follow a regular way in their improvement over time. He set the laws of technical systems evolution to predict improvements that are most innovative, attractive, and convenient [13] as well, the nine windows. It may be an ideal tool to understand the system context and to predict a convenient future solution.

The nine windows can describe the system in past, present, and future. The super system and subsystems are very important to understand the organization's evolution and forecast opportunities.

Bertoncelli [14] uses the multi-screen to enhance team engagement and to enlarge their competencies in business development. We add that the nine windows can also submit actual marketing strategy tools like Porter's value chain or porter's five forces. The actual strategy tools focus on a small part of the organization context. TRIZ with the nine windows focus on

organizations needs (customer, activity, structure, concurrence...)

Authors adopt in figure 2 a roadmap using the nine windows to describe business issues and draw the vision for better business evolution.

The road map allows exploring the organization at each of the three levels:

**Extern system:** Refers to the external environment that the organization interacts or may interact with. We describe the Market, customers' needs, suppliers, and competitors. The present external system describes actual opportunities and Threats, while the future state illustrates the future trends and ideal opportunities. Both the actual and future extern system shows why we have to change. The past stat highlights the environment evolution.

**System:** Describes the studied organization during the time. According to the organization, needs, we can aboard the organization assets, activity portfolio, management style, or leadership. The past vision and the actual situation drew the improvement way. Whiting the extern system study, we can create new ideas for a winning organization, and describe strategic objectives.

**Intern system:** Parts of the organization we need to challenge and improve to get strategic objectives. At this step, we define operational objectives and potential projects in the future stat.

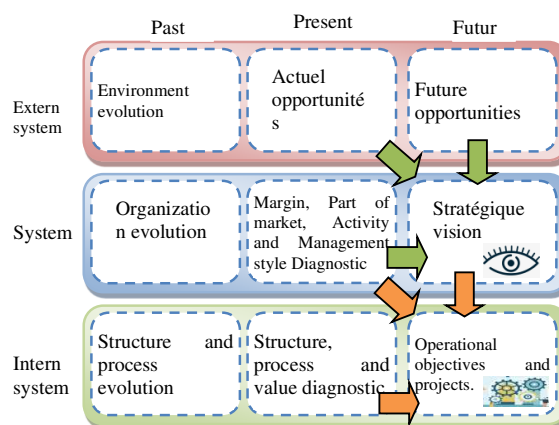
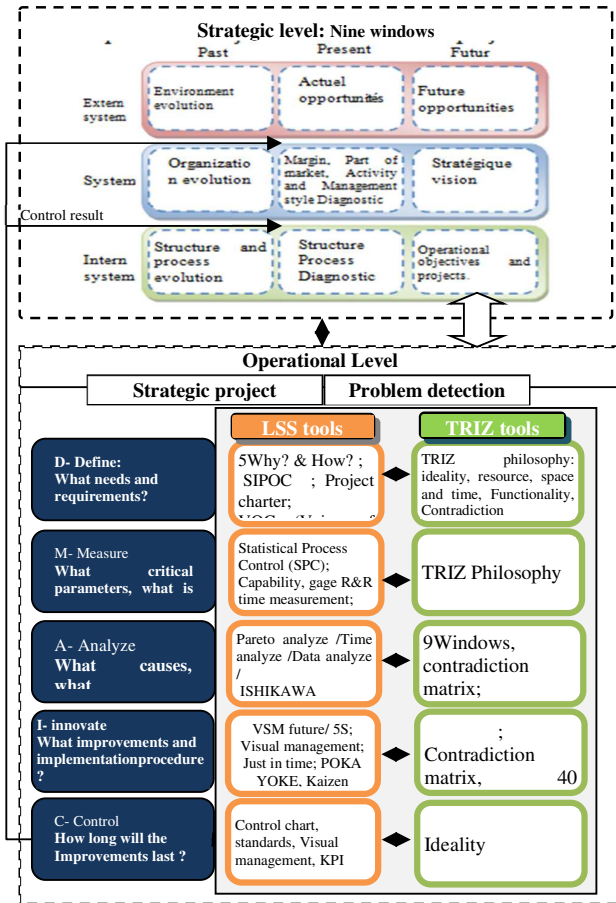


Fig.2. The nine windows to create a winner strategy

### 2.2 The need for TRIZ to reinforce the operational system

Strategy takes you from where you are now, to an ideal future. Furthermore, it makes link between the organization mission and profit [7].

By defining Operational objectives and strategic project, organization concentrates all resource and energy to increase competitiveness.



Strategic projects or problems detected may present a real difficulty to solve. Most of company's staff would use their intuition, and their own experiences to solve problems [3]. To overcome these difficulties, organizations have to use a systematic method to be more efficient [4]. LSS presents structured, statistical and popular methodologies, to improve business opportunities [8].

Furthermore, TRIZ provides a solution using every resource potential and a knowledge base for more than two million patents in the world to get excellence [16].

LSS and TRIZ integration provides an ideal framework for solving problems. Many research proved integration efficiency [6, 9, 17]. Soti [6] proved that the integration is helpful to reduce efforts and project time. It provides a better solution and gives many innovative ideas to

solve the problem in a short time. Figure 3 presents the Holistic framework combining strategic and operational levels. The operational level integrates TRIZ to the DMAIC method, as proposed by Soti[6], to increase creativity and to generate new ideas for problems. Moreover, we give importance to TRIZ philosophy to conduct define, measure and analyze steps. The space and Time pillar allows setting the system context and defining the system evolution in time and space. Moreover, functionality describes the basics needs and shows why this situation is a problem. Furthermore, the ideality allows making clear objectives according to the global strategy. It explains the gap between the actual situation and desired situation.

The association of the three dimensions (strategy, innovation with TRIZ, and problem solving efficiency with LSS and TRIZ) makes the organization more competitive, more efficient, anticipate the future and make staff focus on priorities.

### 3. CASE STUDY: IMPROVING ENGINEER SCHOOL ASSOCIATION.

Our goal is to ensure a successful engineer school association. A comprehensive examination of all relevant aspects of the interrelated system with engineering education, engineering practice, laureate, and the global economic system is needed to ensure the association efficiency. This will require that action should be taken with key stakeholders, particularly student engineers and the professional societies.

We scheduled brainstorming meetings with stakeholders to understand the association past and actual situations. we also collect stakeholders needs and hops.

The association strategy and operational objectives are presented in the nine windows map table 1. We could observe clearly that the chart gives guidance for diagnostic steps. The future environment overcomes psychological inertia and makes the association ready for an ideal challenge.

The association was created for the first time in 1993. The main objective was to keep links with laureates. Unfortunately, the association has a poor impact and could not federate laureate and

students engineer. Since 2012, the association had no real effective role. That explains why 85% of students do not know the association. Moreover, they never participate in the

association events. Furthermore, 15% of student engineer that knows the association contact the association only when they need to find a job or training.

**Table 1.**

The strategic nine windows to improve the engineer association.

	Past	Present	Future
<b>Extern System</b>	<p><b>Economic context:</b> -Few companies in the market -Few engineer demand</p> <p><b>University:</b> -Few engineer university</p> <p><b>Student engineer:</b> -Good technique competencies -Need to develop interrelation skills</p> <p><b>Laureate engineer:</b> -No connection between laureates.</p>	<p><b>Economic context:</b> -New multinational investment. -Markets in a growth phase</p> <p><b>University:</b> -Rude competitiveness between schools</p> <p><b>Student engineer:</b> -Disconnected from the real industrial context -Good technique competencies -Need to develop interrelation skills</p> <p><b>Laureate engineer:</b> -Difficulty to access the job market -No connection between laureates</p>	<p><b>Economic context:</b> - Favourable intern business climate/ New markets in digitalization, renewable energy and new technologies /Rude local competitiveness</p> <p><b>University:</b> -Rude competitiveness between schools</p> <p><b>Student engineer:</b> - Interconnected engineer / Creative thinking/ Business competencies</p> <p><b>Laureate engineer:</b> -Business directors/ Economy developers/ Have no time ,so busy</p>
<b>System</b>	<p><b>Association:</b> -the association's goal is to support, help and connect students and the laureates. -Based only in Casablanca. -few active members</p>	<p><b>Association:</b> -Transition phase looking for the improvement - Located only in Casablanca /Few members</p>	<p><b>Association:</b> -School/ engineer /laureate / business empowerment source - Ensure the highest adhesion level -Accentuate the association presence in National and international areas</p>
<b>Intern system</b>	<p><b>The association comity:</b> -Annual meeting</p>	<p><b>The association comity:</b> -Annual meeting -No presence in social media -No brand image -No objectives for members -No improvement programme -No activity programmes -helping engineers with specific needs.</p>	<p><b>Regional comity:</b> -Adherents recruitment -Regional communications -Regional activities</p> <p><b>Networking comity:</b> - Create laureates and student engineer secure database. (30% the first year, 50% the second year;75%third year) - Make conventions with partners (as banks, restaurants, sports clubs,...) for adherents. (5 conventions first year) -Make convention with national and international business association (2 conventions first year) - Scheduled meetings for networking and doing business (Every 3 months the first year, every month second year) -Create a recruitment platform Sharing recruitment needs and engineer CV.</p> <p><b>Communication comity:</b> -create the brand image</p>

			<ul style="list-style-type: none"> <li>- Reinforce the association presence in social media</li> <li>-Prepare for an important conference. (One every year starting from the second year/industry and high education minister presence)</li> <li>-Ensure the association presence in national and international events (2-business; 1-environment; 1-social events first and second year)</li> </ul> <p><b>Learning comity:</b></p> <ul style="list-style-type: none"> <li>-Animate learning conference (new technology, environment, relational skills; Digitalization;...) (Every 3mounth)</li> <li>- Coaching startups/ Coaching new engineer laureates /Coaching trainee with difficulty</li> </ul> <p><b>Education improvement comity:</b></p> <ul style="list-style-type: none"> <li>-Evaluate the actual system and make improvement plans to progress the educative system.</li> </ul>
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Nowadays conditions have changed; the school has more than 5000 engineer laureate. Moreover, the market is in expansion, which makes good opportunities for laureates to do business and for student engineer to have jobs. However, the engineer school's number increases so as the school competitiveness.

The association empowerment is required to enhance the school's value and to help engineers to take advantage of environmental opportunities and threats. Furthermore, the association needs to be prepared for the future. The extern environment is in continuous change, the association has to participate effectively in this change to lead, to shining, and to be in a powerful position. The strategic nine windows map, presented in figure 4, allows setting a clear vision about the new association and describing strategic projects and objectives.

We observe members' motivation at the moment we present future opportunities. Active members agreed that an ideal strategy and vision will lead stakeholders to an ideal future.

Active members collaborate to built comities as well as objectives and tasks for each comity.

We observe that some projects are simple to implement, like participating in international conferences or education forums. However, making an impact and federating engineers to the association is still a complicated task. Besides, proposing education system improvement still a complex mission, we need to make benchmarks, to lead investigations, to

measure the actual system efficiency, to analyze weakness, and to propose innovative solutions for the new education system. Unfortunately, association empowerment is in early stage, we need more time to execute the strategy and to present results.

#### 4. CONCLUSION, LIMITATIONS AND FUTURE RESEARCH

The nine windows could be used as strategic tool to innovate and ensure a powerful organization. First, it shows the reason for the change, which reduces staff resistance. Then, it allows a focus on the right opportunities.

We do not need a big experience to generate new ideas we need just to listen to stakeholders' needs, to make benchmarks in order to know how competitors think and set the vision for the future.

Operational objectives are systematically inspired from the extern systems' future needs and the system vision. The framework is tested in an engineer association. Authors could be member in the association, and to initiate the change.

Unfortunately, to test the operational level it takes more time. For further researched, the ideal case study would be leading the change from the



strategy to the implementation, testing the methodology on business companies, and measuring the impact and factors influencing the methodology.

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## UN MODEL HOLISTIC PENTRU ÎMPUTERNICIREA AFACERILOR DURABILE ȘI INOVATIVE

**Rezumat:** Într-o lume de afaceri competitivă, excelența devine o necesitate. Cu toate acestea, modul de realizare și menținere a acestuia este contracarat de probleme. Această lucrare își propune să dezvolte un cadru holistic, inovator și durabil pentru îmbunătățirea competitivității organizațiilor. De obicei, cadrele de excelență se concentrează pe dezvoltarea nivelului operațional folosind diferite instrumente precum LSS, DFSS sau QFD. Această lucrare încearcă să evidențieze importanța unei strategii inovatoare pentru a construi viziunea ideală de afaceri înainte de a ataca nivelul operațional. Studiul de caz demonstrează eficiența metodologiei. În concluzie, această metodă holistică ar trebui să schimbe practicile industriale și să arate puterea TRIZ pentru crearea unei strategii câștigătoare.

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