



Total Resource and Energy Efficiency
Management System for Process Industries

Deliverable 8.7

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Executive Summary

This report is a summary of MAESTRI Videos creation process. Two animation were created in order to promote selected findings of Work Package 3 and also to visualise MAESTRI Total Efficiency Framework. Both videos are approx. 9 min long, in English, subbed in all partners' local language (Polish, Portuguese, Italian and German).

The topic of the first one is Eco Orbit View, a method designed to establish a connection between business and environmental aspects in order to select improvements that are beneficial for both of them simultaneously. The second one is Eco Lean Management Board, a method created for visualisation and management of crucial business and environmental aspects for different organizational levels.

All videos are available on the MAESTRI YouTube channel:

https://www.youtube.com/channel/UCo-1MaiXnt_Xod3I-I-wJ7w



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Abbreviations

IoT – Internet of Things

MTEF - MAESTRI Total Efficiency Framework

EOV – Eco Orbit View

ELMB – Eco Lean Management Board

Introduction

In order to be able to reach stakeholders who are moving with the times, communication forms should be adapted to their needs. Today's society focused on visual stimuli departs from traditional sources of information. To ensure global reach and ease of communication for all audiences, animations have been created within the MAESTRI project to enable this. Both animations concern the promotion of sustainable development in industrial enterprises using concepts based on Lean Management¹ philosophy.

1 Objectives and approach

The goal was to create two MAESTRI Videos that are intended to present part of the results of work carried out under Work Package 3. The aim of this form is to present, in an accessible way, two training modules that are a part of MAESTRI Effective Management System:

- a) Eco Orbit View
- b) Eco Lean Management Board

In addition, it was also important to indicate the location of Work Package 3 results in the entire Maestri project concept and to present in simply way the remaining elements of the Maestri Total Efficiency Framework (MTEF). Maestri Videos are supposed to be a form of digitalization of project results. By posting results on Youtube, the audience of project results should widening and the results itself should be easier to understand.

To achieve this goals, the currently popular form of visual communication was chosen, which is a “whiteboard” type animation, where individual elements are drawn on a white background (Figure 1).

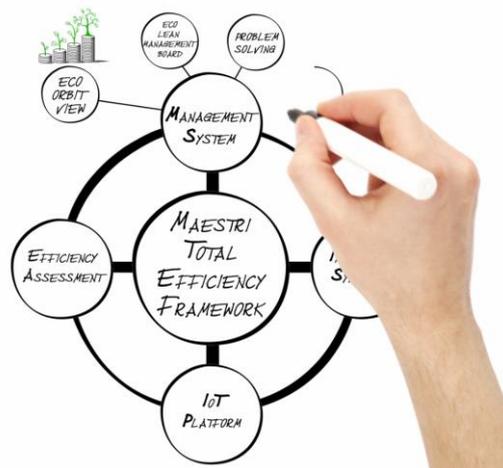


Figure 1 The example of “whiteboard” style animation

¹ Lean management is a series of practices that develops people to understand and own their problems, and aligns resources to achieve the purpose of the organization. Lean management engages everyone in designing processes to continuously solve problems, improve performance, and achieve purpose while consuming the fewest possible resources.[1]

2 Maestri Videos – creation process

In the process of creating both animations, LEI Polska cooperated with a professional external company – IKONA – providing services in the creation of this type of work. Both films were created in parallel according to the schedule set for implementation in weeks 8-35 of 2018 year. The schedule contained the following stages:

- a) a general outline, the purpose of which was to define what the individual video should contain and what information should be provided to viewers
- b) scenario describing individual scenes (which will be seen on individual frames) and text for the lector
- c) translating the text into German, Italian, Portuguese and Polish in order to obtain subtitles for different language versions. For this task, LEIP strongly cooperated with other partners. After having written the initial draft, UCAM proof-read the transcripts. Then localization into local languages have been realized by LEIP, for Polish, Sinergie, for Italian, FIT and ATB, for German, and ISQ for Portuguese.
- d) graphic visualization of individual scenes
- e) animation of individual scenes
- f) combining text, animation and music together
- g) upload on YouTube
- h) posts on social medias

3 Maestri Videos – presentation of the results

3.1 Eco Orbit View animation

Title: ECO ORBIT VIEW - Connections between environmental and business aspects of the production process

Duration: 00:08:03

Access:

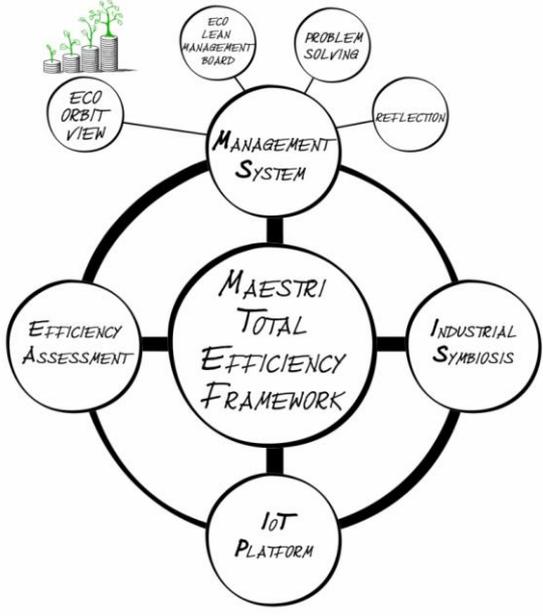
Language / subtitles	Link	QR Code
English / None	https://www.youtube.com/watch?v=6_2aXJ_ZTIw	
English / Polish	https://www.youtube.com/watch?v=kswQLFYGtQ0	

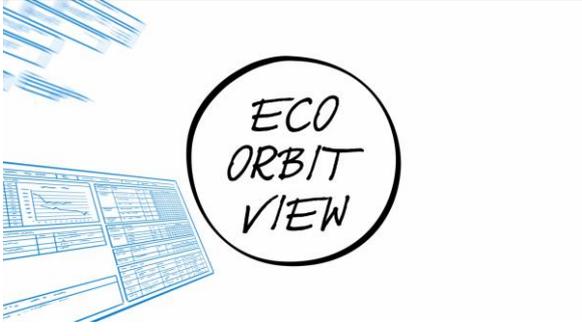
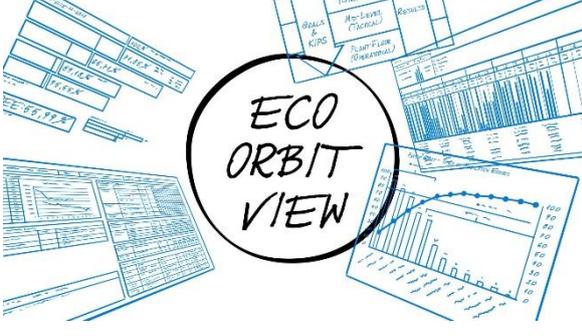
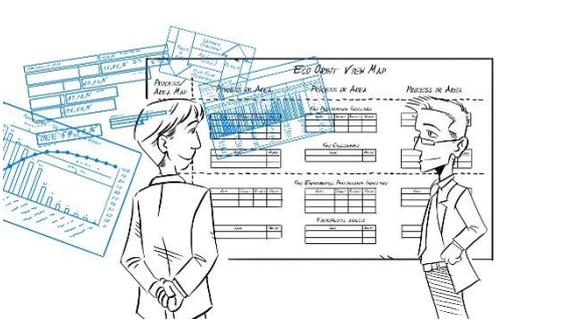
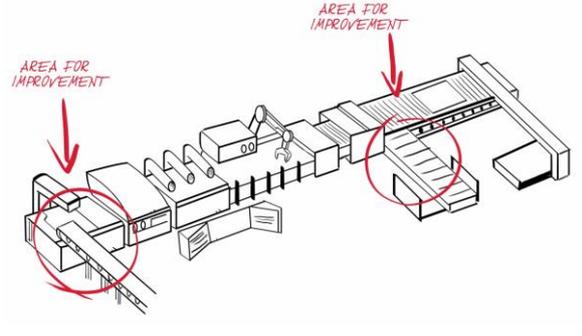
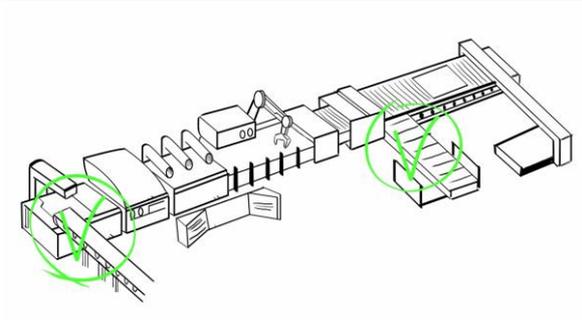
English / Portuguese	https://www.youtube.com/watch?v=qgYp9JZI-44	
English / German	https://www.youtube.com/watch?v=2CQ0Jm7iR4I	
English / Italy	https://www.youtube.com/watch?v=9Vfz604_jbM	

Content:

The animation presents the Eco Orbit View tool developed as a part of the Maestri project within Work Package 3. The Eco Orbit View is a method to identify and visualize business and environmental indicators and synergies between them. In order to prepare this, it is necessary to analyse the main challenges and problems inside the company. This information allows to identify a focus area and define improvements that will have a positive impact both on business and environmental aspects.

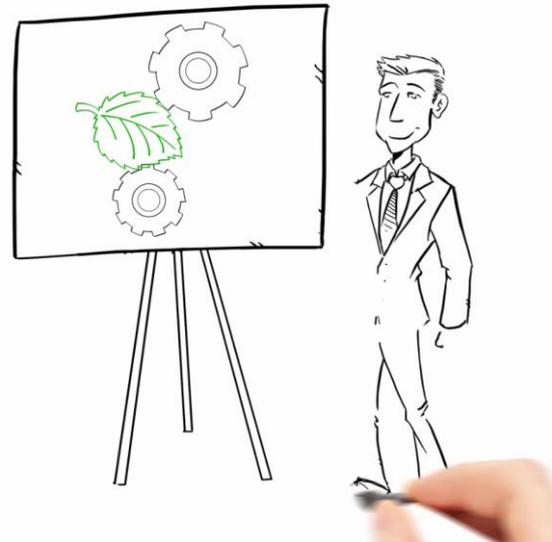
Storyboard:

Text	Visualisation
Intro	
<p>Eco Orbit View is a proven method of planning the production process, which takes into account both business and ecological objectives.</p>	
<p>This is also a component of the MAESTRI Total Efficiency Framework – which integrates several tools designed to support corporate sustainable development. We'll cover this in more detail later in the video.</p>	

<p>Let's now focus on Eco Orbit View. And on how this tool can help the company.</p>	 <p>The image shows a stylized logo for 'ECO ORBIT VIEW' inside a circle, with a background of blue-toned data charts and graphs.</p>
<p>It's a method for quick analysis of the production process, so its task is to instantly generate insight for the company.</p>	 <p>The image shows a central 'ECO ORBIT VIEW' logo surrounded by various data visualization elements like bar charts, line graphs, and tables, all in a blue-toned style.</p>
<p>This information will provide managerial staff with a ready visualisation of business and ecological challenges they face in the production process.</p>	 <p>The image shows two people, a man and a woman, looking at a large screen displaying the 'ECO ORBIT VIEW MAP' and various data charts.</p>
<p>Moreover, they will find out which areas require improvement.</p>	 <p>The image shows a 3D perspective view of a production line. Two specific areas are circled in red and labeled 'AREA FOR IMPROVEMENT' with red arrows pointing to them.</p>
<p>The tool will also help to suggest improvement projects that will take into account both business and ecological objectives.</p>	 <p>The image shows the same 3D perspective view of a production line as in the previous row, but now with green circles and checkmarks overlaid on different parts of the line, indicating suggested improvement projects.</p>



Consequently, adopting the Eco Orbit View will allow the company's management to collate all the data needed to improve the production process sustainably. Environmental aspects will be an intrinsic part of improvement projects.



What must be done to achieve this result? Workshops must be organised for and attended by production managerial staff. Employees from Operation Maintenance, Quality, Design and other related departments should also take part to ensure that the fullest picture of the production process is obtained.



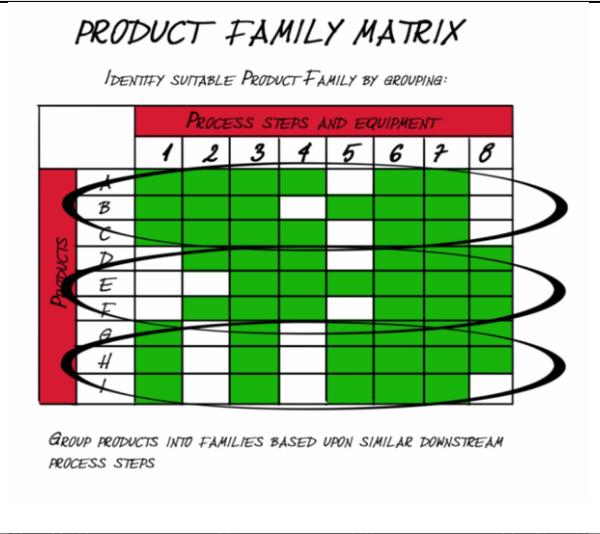
It's worth discussing what type of data is used in the Eco Orbit View method. It's called "Orbit View" for good reason. When looking at the Earth from orbit, we can see only the biggest objects and don't need to go into details to discern the whole.



Similarly, while analysing the production process – we focus only on selected key aspects to get the overall picture.



The first task during the workshop will be to select a product family to be analysed. A product family refers simply to products manufactured with the same plant and machinery, using the same or similar process. To improve the analysis, attention is given to the most essential part of production – the family that generates the highest profit for the company.



The second step, or a walk – to be precise, is the Gemba Walk. It's the observation of the production process on the production shop floor. This allows us to determine individual production phases.



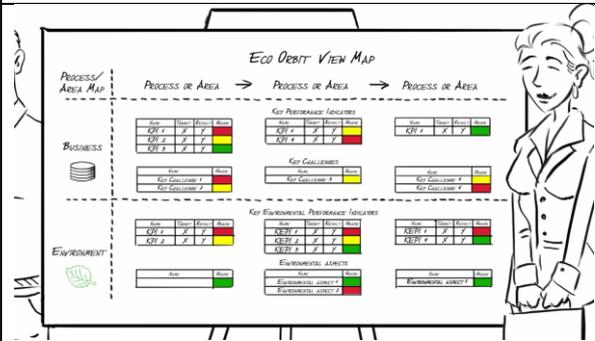
During the Gemba Walk, two further tasks are done. The first one entails talking with people in charge for the individual phases of the production process. The goal is to gain knowledge of business objectives and challenges for the next phases.



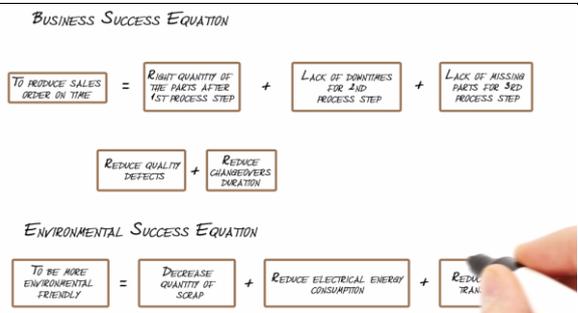
The other task is to identify the environmental aspects of the process. We ask, among other things, about the monitoring of waste, increased consumption of resources and possible reasons behind it.

- Monitoring of Waste
- Increased Consumption of Resources
- Possible reasons for increased consumption of resources

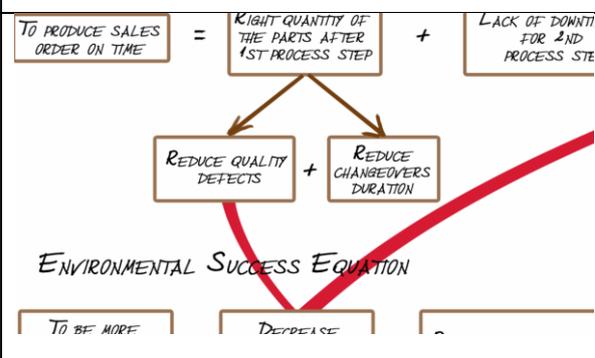
After the information has been gathered, it must be visualised in the form of the Eco Orbit View Map. As we discuss the process, we populate the map with each phase of the production process, as well as the associated business and environmental challenges. We mark those which are the most challenging for us in red, those with a lower priority in yellow, and those which are under control – in green.



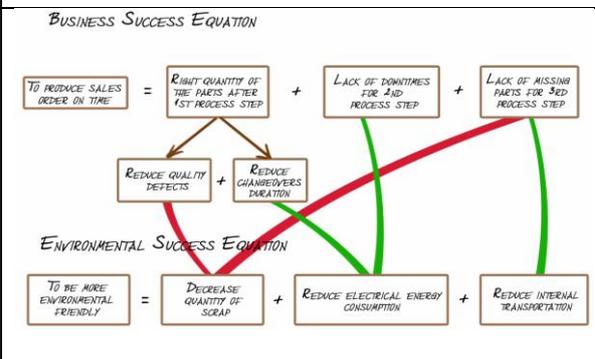
The last task is to determine what must be dealt with first. Priorities are set with two Success Equations – the first one concerning the business and the other ecological perspective.



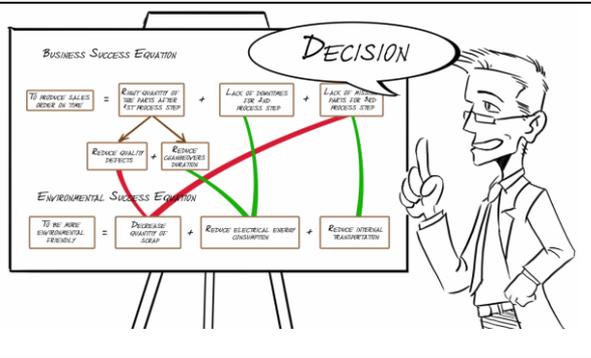
We choose the most essential aspects (note that we've already assigned them colour codes) and try to find out what are the relationships between them. If a business aspect has a direct bearing on an ecological one, we mark this relationship in red. An example is a connection between lowering the number of defects in metal components and reducing scrap material.



If there's an indirect bearing, we mark it in green. Let's take as an example of reducing time for plant and machinery retooling, which has a bearing on reducing working time and – possibly – reducing overtime, and thus consumption of energy and raw materials.



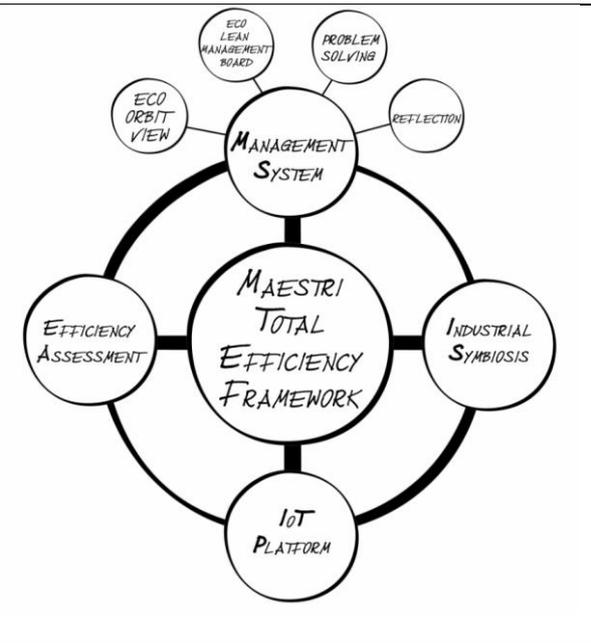
The Success Equations will give us advice on what to do first, in order to improve the production process in the most effective and sustainable way. And that's precisely what should be the number one target of every company.

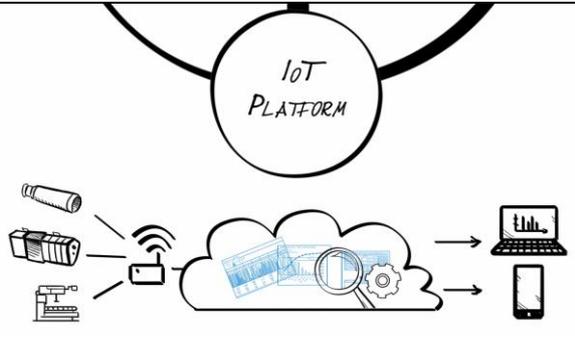
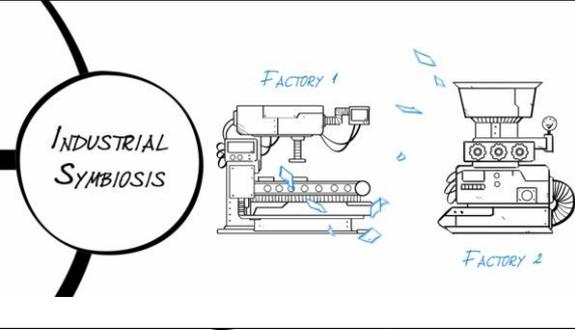
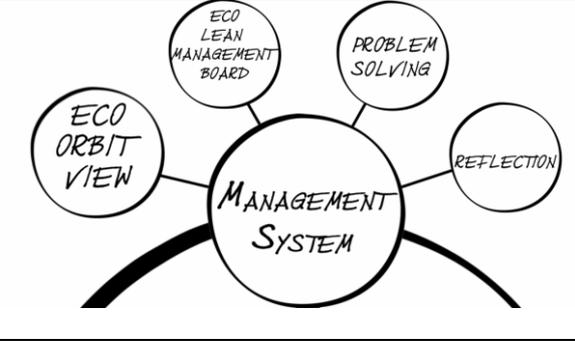
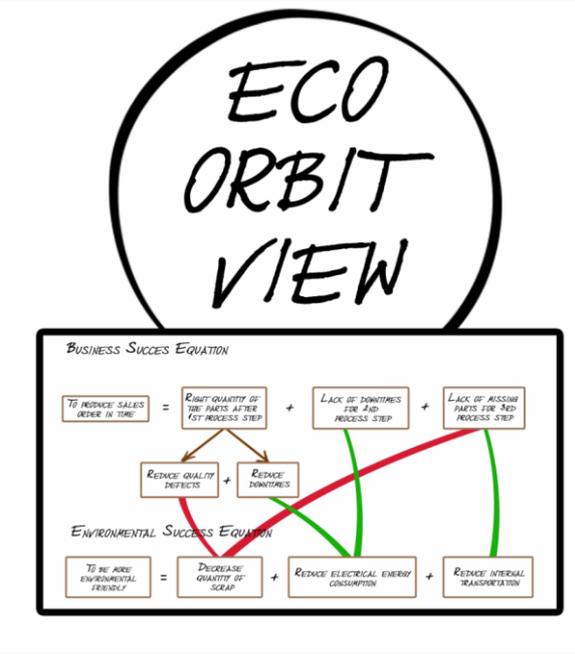


Analyses like Eco Orbit View must be carried out regularly, preferably once a year. The needs of the production process are constantly changing. It's worth tracking these changes to keep your finger on the pulse. And the Eco Orbit View makes this possible.



As mentioned at the beginning, the Eco Orbit View method is one of the tools of the MAESTRI Total Efficiency Framework. It's a set of solutions fostering the sustainable development of the organisation.



<p>The Internet of Things platform provides tools to facilitate an automated data transfer from machines, systems and sensors in the industrial shop floor to different data analysis and visualisation tools.</p>	
<p>Industrial Symbiosis analyses the company's waste and checks whether it could be used as raw material for another company.</p>	
<p>Management System is a supporting pillar which consists of four training modules. Each of them boosts the effectiveness of the company management system to a specific extent.</p>	
<p>We've already seen the Eco Orbit View module in the first part of this video., As we saw, it allows for the quick analysis of the production process while paying special attention to business and environmental challenges.</p>	

The Eco Lean Management Board module is a tool designed for the effective monitoring of the key aspects of the production process.



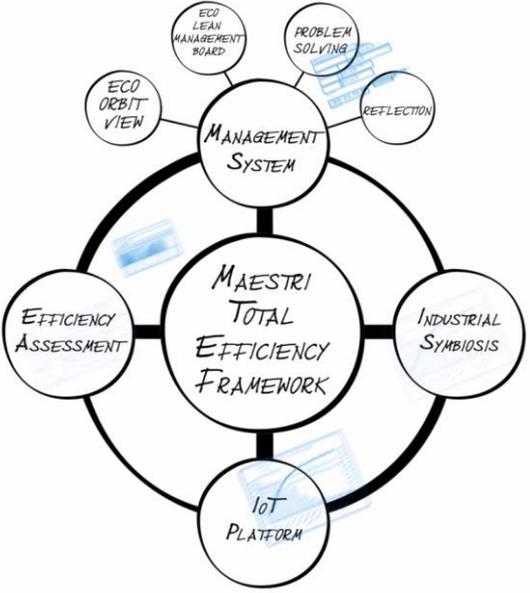
The Problem Solving module, as implied by its name, helps with problem-solving. These tools are incorporated into the structure of the Eco A3 report, which is similar to a standard A3 report, but additionally takes into account the environmental impact of the problem being solved.



THE ECO A3 REPORT			
BACKGROUND		FUTURE STATE & COUNTERMEASURE	
BUSINESS PERSPECTIVE \$	ENVIRONMENTAL PERSPECTIVE 🌿	📈	
CURRENT STATE		IMPACT	
BUSINESS PERSPECTIVE \$	ENVIRONMENTAL PERSPECTIVE 🌿	BUSINESS PERSPECTIVE	ENVIRONMENTAL PERSPECTIVE
OBJECTIVE		FOLLOW-UP	
BUSINESS PERSPECTIVE \$	ENVIRONMENTAL PERSPECTIVE 🌿	🔍	
ROOT CAUSE ANALYSIS			

The last module is Reflection – a tool used to improve the Management Systems processes already in place.



<p>All the solutions discussed above make up the coherent Maestri Total Efficiency Framework concept. It's a proven recipe for the success of an organisation that desires to develop and achieve better and better results also in terms of energy and resource efficiency.</p>	 <p>The diagram illustrates the Maestri Total Efficiency Framework. At the center is a circle labeled 'MAESTRI TOTAL EFFICIENCY FRAMEWORK'. This central circle is surrounded by six other circles, each representing a key component: 'MANAGEMENT SYSTEM' (top), 'INDUSTRIAL SYMBIOSIS' (right), 'IOT PLATFORM' (bottom), 'EFFICIENCY ASSESSMENT' (left), 'ECO ORBIT VIEW' (top-left), and 'PROBLEM SOLVING' (top-right). The 'MANAGEMENT SYSTEM' circle is further detailed with sub-circles: 'ECO LEAN MANAGEMENT BOARD', 'REFLECTION', and 'PROBLEM SOLVING'. The entire framework is depicted with a circular path and some faint background graphics of buildings and a person.</p>
<p>Outro</p>	<p>Thanks for watching!</p>   <p>The bottom section of the slide features a 'Thanks for watching!' message in a handwritten style. To the right is the Maestri logo, a stylized figure. Below this, there are logos for various partners: ISQ, ineq, FSB, ATE, Fraunhofer, UNIVERSITY OF CAMBRIDGE, SINERGI, MP, MCG, WORLEE, I.W. OSTERHOFF, QAS, and GUN PLACT. At the bottom, there is a MAESTRI logo and a text box stating: 'This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 880710'. The SPRE logo and the European Union flag are also present.</p>

3.2 Eco Lean Management Board animation

Title: ECO LEAN MANAGEMENT BOARDS and operational meetings for companies caring for sustainable development

Duration: 00:08:49

Access:

Language / subtitles	Link	QR Code
English / None	https://www.youtube.com/watch?v=bYvy456cNx8&t=19s	
English / Polish	https://www.youtube.com/watch?v=6prFER1-teg	
English / Portuguese	https://www.youtube.com/watch?v=5IJbhiV8zY	
English / German	https://www.youtube.com/watch?v=RWV8p2-ppdg	
English / Italy	https://www.youtube.com/watch?v=mtisMSvW4xY	

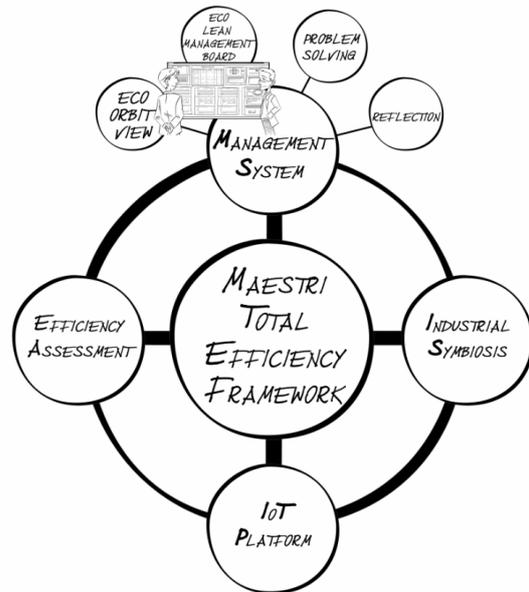
Content:

The animation presents the Eco Lean Management Board tool developed as part of the MAESTRI project. Eco Lean Management Board is designed to select relevant indicators to chosen operational level. Indicators have to be adapted to the current situation of the focus area to reflect its problems and challenges. Eco Lean Management Board underlines the importance of boosting eco-efficiency and is a base to perform operational meetings, which help employees to review indicators and take corrective and preventive actions.

Storyboard:

Text	Visualisation
Intro	
<p><i>Eco Lean Management Board is an information management method in a company which relies on daily meetings and management boards.</i></p>	

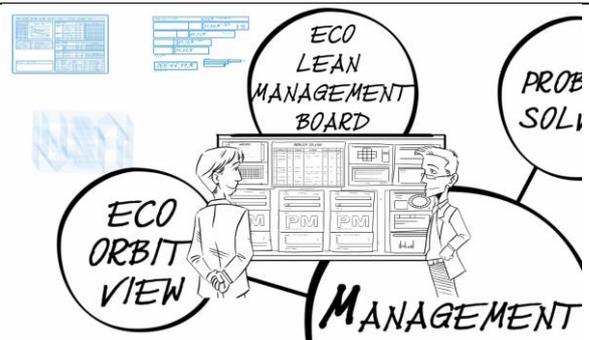
This is also a component of the MAESTRI Total Efficiency Framework – which integrates several tools designed to support corporate sustainable development. We'll cover this in more detail later in the video.



Eco Lean Management Board is a tool used to monitor results and check on a day-to-day basis whether they are in line with the company's business and environmental objectives.



These objectives can be easily and quickly defined by applying the Eco Orbit View method, another MAESTRI Total Efficiency Framework tool.

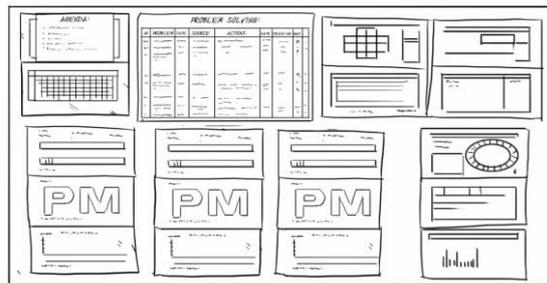


The objectives can also be otherwise determined. In any case, the organisation's objectives must be identified in advance. Without them, it won't be clear whether results observed will let the company pursue their sustainable development strategy in an optimal manner.



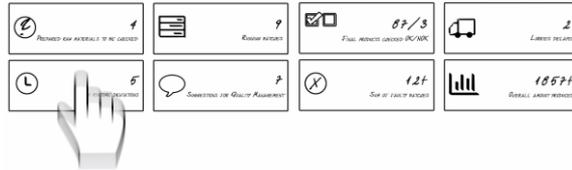
Thanks to the MAESTRI Platform the results can be monitored by means of physical or interactive boards, or using charts showing real-time data.

- PHYSICAL BOARD



- INTERACTIVE BOARD

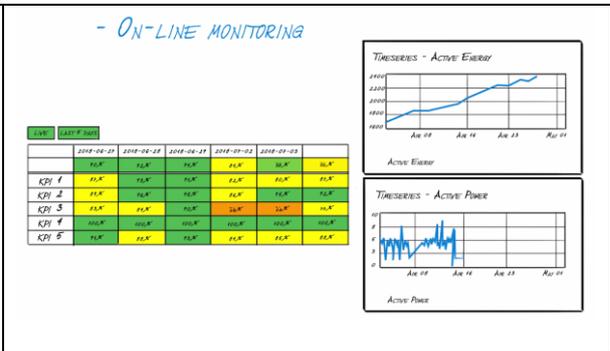
MAIN MENU



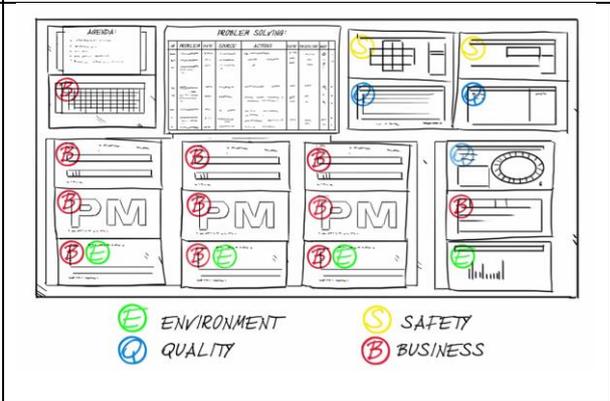
- INTERACTIVE BOARD

BATCH RUNTIMES

Run	W	EXPRES	Finished	Delayed	Reason for deviation
EXPRES	2018-01-02	2018/01/02 01:00	Delayed	Delay in raw materials delivery	
EXPRES	2018-01-02	2018/01/02 01:00	Stop	-	
EXPRES	2018-01-02	2018/01/02 01:00	Stop	-	
EXPRES	2018-01-02	2018/01/02 01:00	Finished run completed	-	Finished and product stored in storage
EXPRES	2018-01-02	2018/01/02 01:00	Delayed	Delayed	Delayed due to delayed cold water temperature
EXPRES	2018-01-02	2018/01/02 01:00	Delayed	Delayed	Plantwide area check failed. Run was blocked
EXPRES	2018-01-02	2018/01/02 01:00	Finished run completed	-	Raw materials quality within this tolerance
EXPRES	2018-01-02	2018/01/02 01:00	Stop	-	-
EXPRES	2018-01-02	2018/01/02 01:00	Stop	-	-
EXPRES	2018-01-02	2018/01/02 01:00	Run	-	-



Consider this example of a physical board. This data will clearly show which indicators are relevant to the business, quality and the environment.



Improvement tools can then be chosen based on various relevant criteria. The boards provide clear information which is easily available to all employees, so they know which aspects of the company's operation are the most crucial for the management.



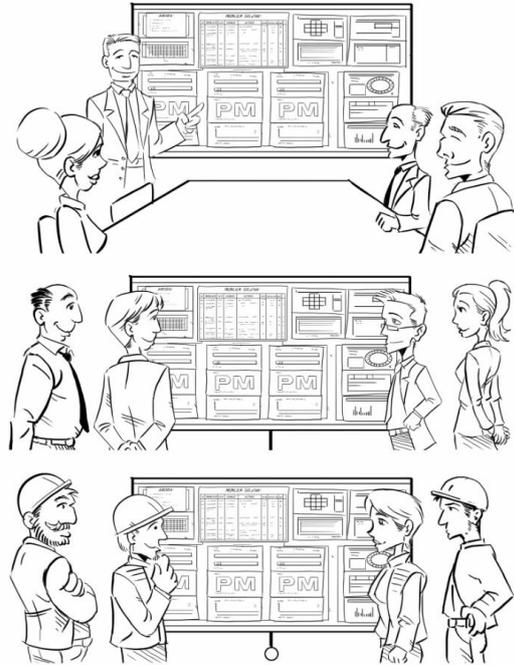
Employees when contributing to the content of boards, become more involved and feel that they may influence decisions taken in the company. This is a powerful way of motivating your staff!



What's more, the room in which we put the boards becomes a place where the employees can meet and share information and experiences. And when problems are visualised, this makes them tangible and thus it's harder to overlook or ignore them.



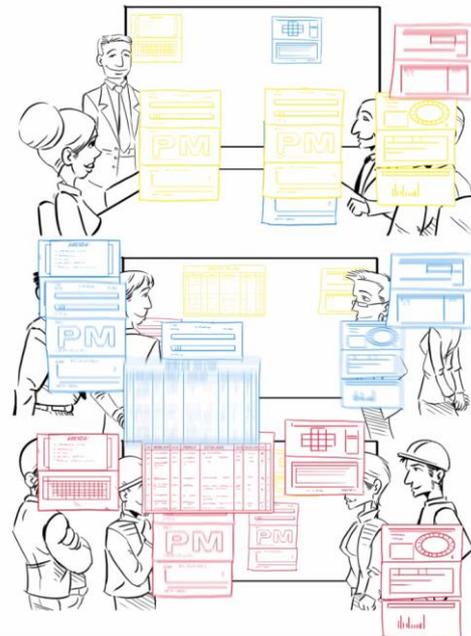
The Eco Lean Management Board workshop can be used at every level of the organisation, but it will deliver the best results when organised in a cascading manner, which means that boards are created for the management in the first place, and then subsequently for lower-level personnel.



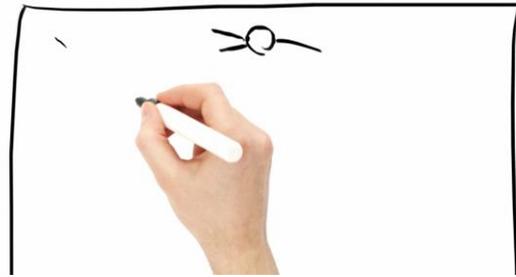
People who will use the boards should participate in creating them to make sure that the boards contain elements on which employees may have real influence and which really affect the organisation's performance.



Information for the management will be of little use to the operations staff. Similarly, the director of the entire area doesn't have to monitor every day in detail whether individual items on the operator's checklist are implemented or not.



However, even the most useful and transparent board will not serve its purpose if there are no clear rules for using it.



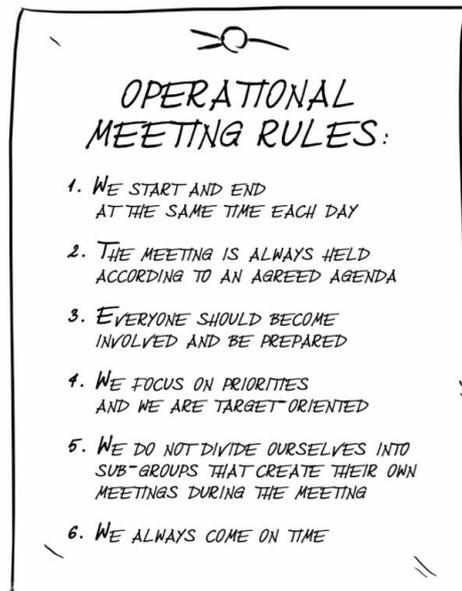
It is therefore important to organise operational meetings, with a clear structure, at which the board will be used as a source of information.

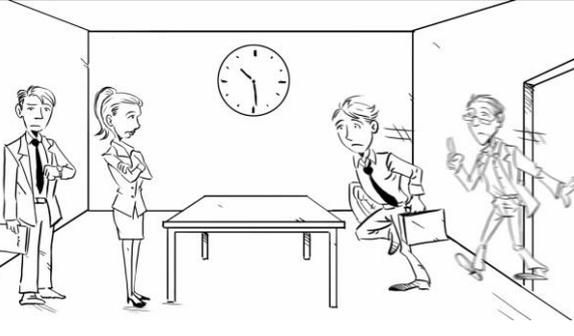
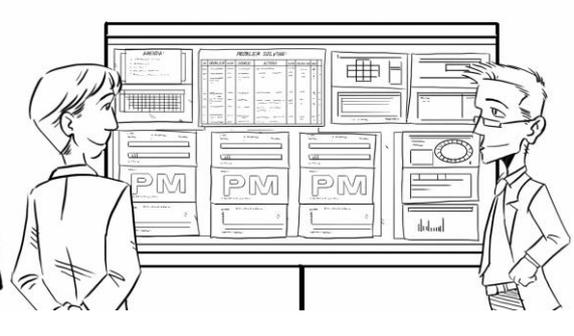
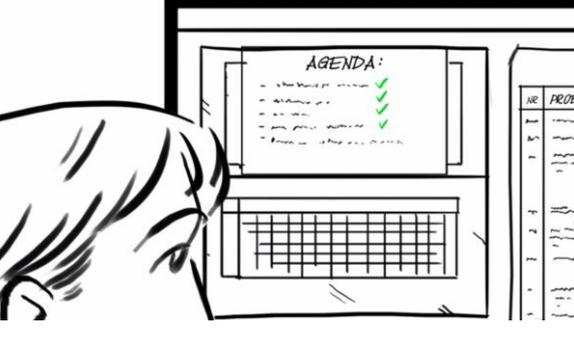


The meetings rules should be clear and accepted by all the attendees.



Here are some examples of good rules. (WHERE?) However, each team should establish their own rules to be followed while running a meeting. This will allow for taking into account the preferences of every team member and the unique features of the organisation. Consequently, meetings will be more fruitful.



<p>Without clear rules, consistently enforced, the meeting may descend into chaos:</p>	
<p>"This may lead to poor preparation, boredom, a feeling of exclusion for some. In all, a sense that the meeting is a waste of time."</p>	
<p>A well organised meeting will have much better results:</p>	
<p>The agenda is set, the meeting begins on time, there's information about a replacement, consecutive items on the agenda are followed, the causes of problems are discussed, and actions required to solve them are suggested.</p>	

Resolved problems are removed from the board, and any new ones that arise are be added in their place. The deadline for problems unresolved changes its colour when they become overdue. All problems which should have been discussed during the meeting are discussed. The meeting ends punctually.

NR	PROBLEM	DATE	SOURCE	ACTIONS	DATE	DEADLINE	WHO
1
2
3
4
5
6
7
8
9
10



What are the advantages of the meeting conducted in this way?

ADVANTAGES OF MEETINGS HELD ACCORDING TO CLEAR RULES



First, when the employee knows what the meeting will look like, they can prepare themselves for it properly.

ADVANTAGES OF MEETINGS HELD ACCORDING TO CLEAR RULES

1.



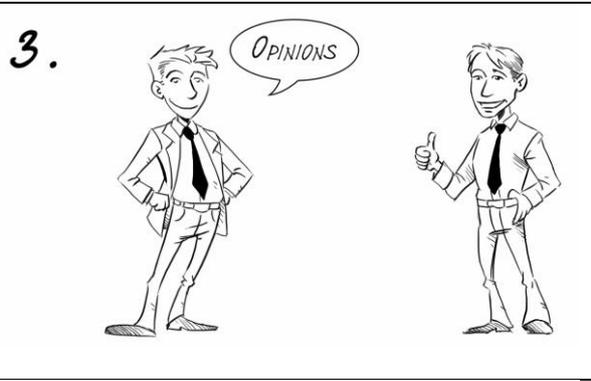
Second, the problem-solving process is more effective, because decisions are taken collectively with the participation of people with different competencies and points of view.

2.

PROBLEM



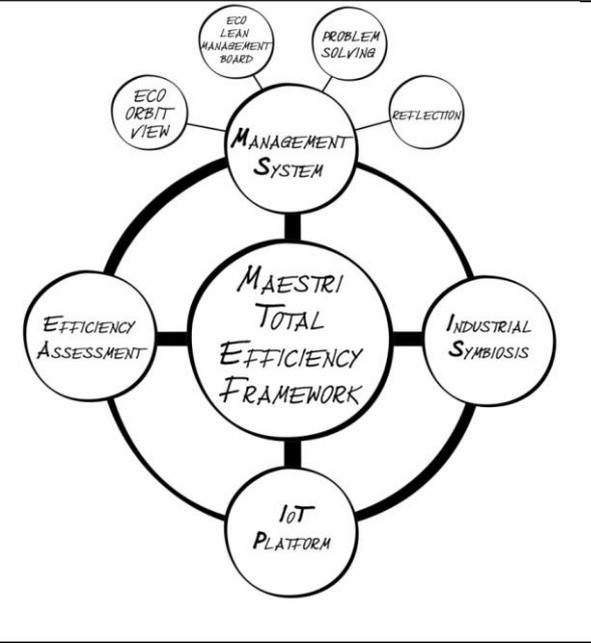
Third, employees know that their opinions are important and that they influence the company's life.



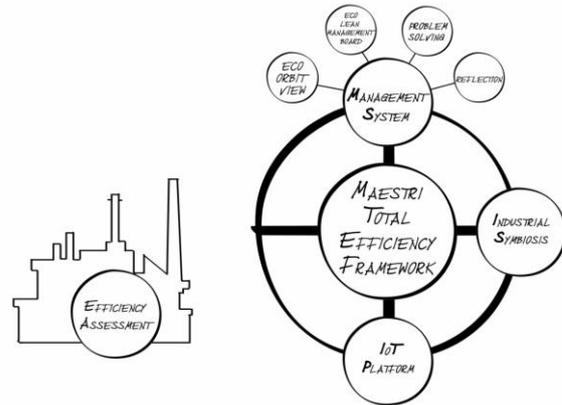
Most importantly: Nobody wasted their time. Effective communication within the team is fundamental to efficient functioning - that's exactly what the Eco Lean Management Board method delivers.



As mentioned at the beginning, the Eco Lean Management Board method is one of the tools of the MAESTRI Total Efficiency Framework. It's a set of solutions fostering the sustainable development of the organisation.



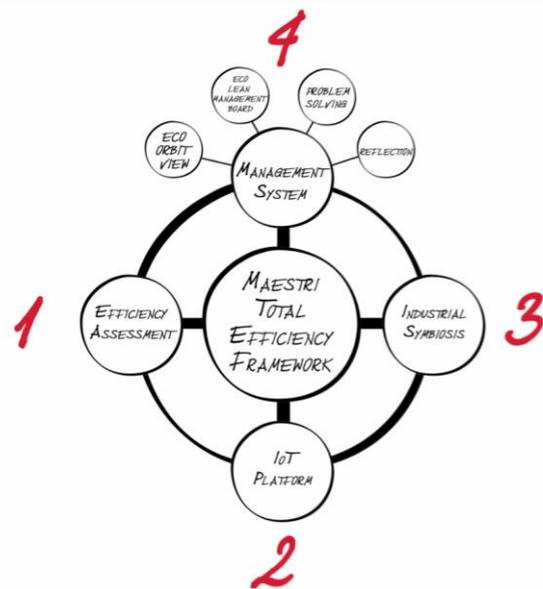
These tools and solutions can be applied independently, adapting individual tools to one's own needs and goals. However, the best outcome is produced by combining them, as the solutions support each other, bringing about a synergy effect.



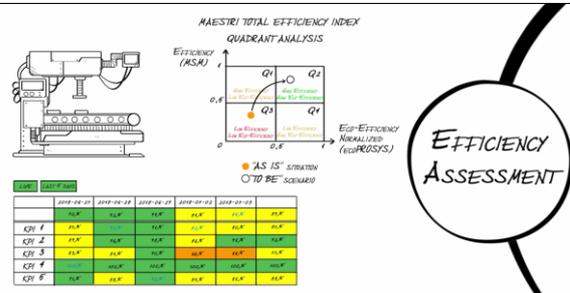
The MAESTRI Total Efficiency Framework concept allows for the observation of processed data relating to the real-time production process, so it fits squarely into the Industry 4.0 trend.

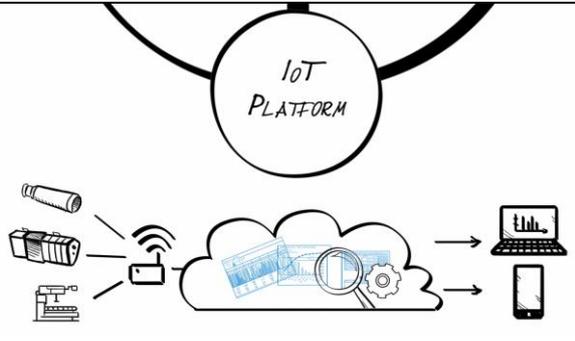
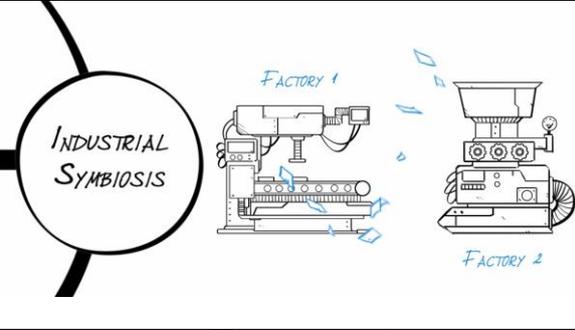
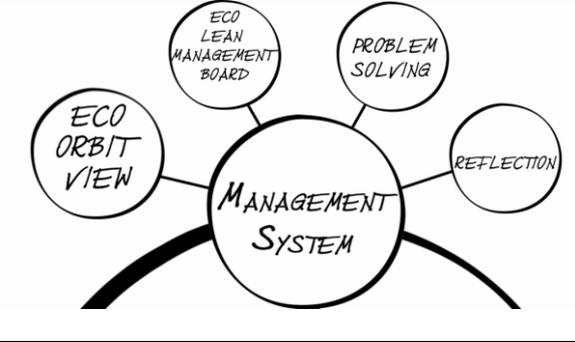
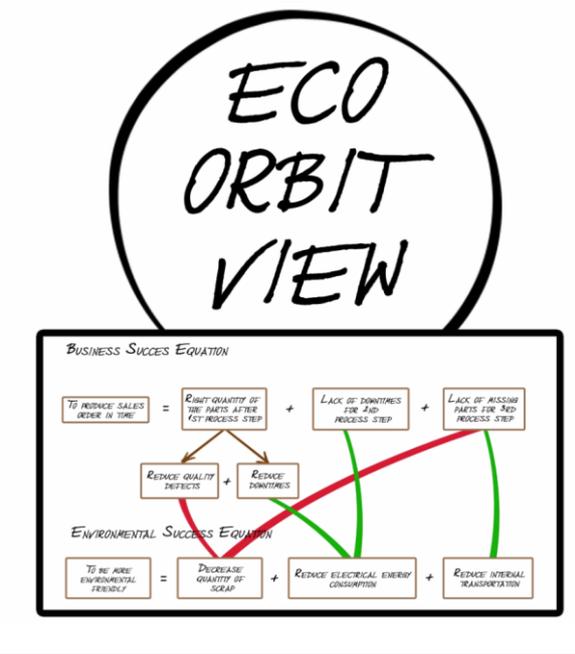


It consists of four pillars.



Efficiency Assessment includes two tools – Multi-Layer Stream Mapping and ecoProsys – which make it possible to analyse the effectiveness of the real-time production process, based on data captured by sensors located on plant and machinery. Thanks to this, decisions taken on the basis of them are prompt and rely on facts.

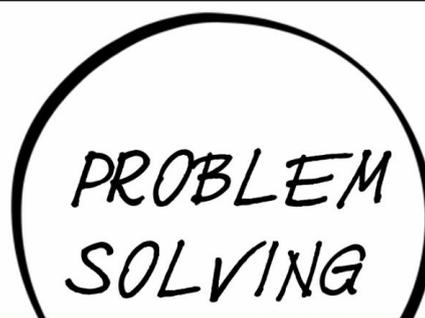


<p>The Internet of Things platform provides tools to facilitate an automated data transfer from machines, systems and sensors in the industrial shop floor to different data analysis and visualisation tools.</p>	
<p>Industrial Symbiosis analyses the company's waste and checks whether it could be used as raw material for another company.</p>	
<p>Management System is a supporting pillar which consists of four training modules. Each of them boosts the effectiveness of the company management system to a specific extent.</p>	
<p>The Eco Orbit View module allows for the quick analysis of the production process while paying special attention to business and environmental challenges.</p>	

We've already seen The Eco Lean Management Board module in the first part of the video. As we saw, it's a tool designed for the effective monitoring of the key aspects of the production process.



The Problem Solving module, as implied by its name, helps with problem-solving. These tools are incorporated into the structure of the Eco A3 report, which is similar to a standard A3 report, but additionally takes into account the environmental impact of the problem being solved.

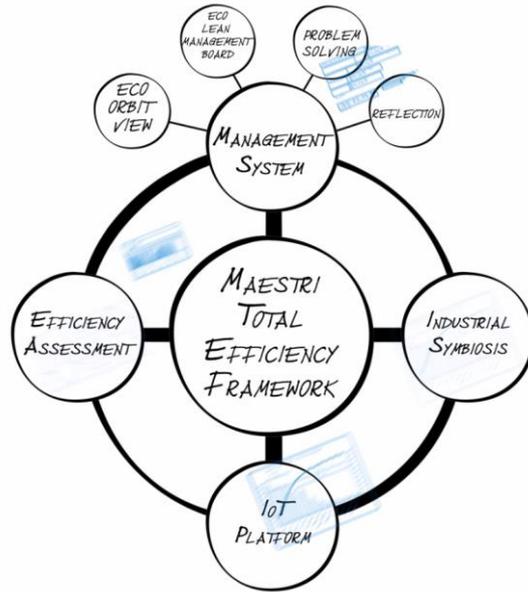


THE ECO A3 REPORT			
BACKGROUND		FUTURE STATE & COUNTERMEASURE	
BUSINESS PERSPECTIVE \$	ENVIRONMENTAL PERSPECTIVE 🌿	📈	
CURRENT STATE		IMPACT	
BUSINESS PERSPECTIVE \$	ENVIRONMENTAL PERSPECTIVE 🌿	BUSINESS PERSPECTIVE	ENVIRONMENTAL PERSPECTIVE
OBJECTIVE		FOLLOW-UP	
BUSINESS PERSPECTIVE \$	ENVIRONMENTAL PERSPECTIVE 🌿	🔍	
ROOT CAUSE ANALYSIS			

The last module is Reflection – a tool used to improve the Management Systems processes already in place.



All the solutions discussed above make up the coherent MAESTRI Total Efficiency Framework concept. It's a proven recipe for the success of an organisation that desires to develop and achieve better and better results also in terms of energy and resource efficiency.



Outro

Thanks for watching!



4 Conclusion

The created animations are presenting two tools developed as a part of Work Package 3 - Eco Orbit View and Eco Lean Management Board. A common element of both of them is the MAESTRI Total Efficiency Framework visualization, in which both tools were tested.

Both videos show most important elements of depicted tools and what are the expected results after successful implementation. Eco Orbit View as a method of establishing connections between important business and environmental aspects and Eco Lean Management Board as a method of visualization and efficient management of this aspects on each and every level in organization are complementary tools. This is a reason why these two were selected as a main result from Work Package 3 suitable for MAESTRI Videos topic.

The use of the "whiteboard" concept to create both films was aimed at increasing the attractiveness and transparency of the presented results. This solution should result in an increase in the number of audience and a better understanding of the content presented. Moreover, in order to keep the attention on the higher level both videos do not exceed more than 9 minutes.

References

- [1] Lean Enterprise Institute, *Lean Lexicon: a graphical glossary for Lean Thinkers*, 5th editio. Cambridge, USA: Lean Enterprise Institute, 2014.