RailActivation project: the adoption of Workplace Innovation in the Rail Sector

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Abstract:

The rail sector has a significant impact on European industry, hence it is important that it follows current innovative trends if it wants to stay competitive. To this end, the railway sector has to adapt to the new digital revolution that is sweeping the sector, but especially the small and medium-sized companies that are part of it, and Workplace Innovation will play a key role in this process. During the RailActivation project it has been seen that SMEs have difficulties when it comes to developing and applying innovation, but due to their size SMEs can gain the advantage of implementing innovation more quickly.

The RailActivation project aimed to help SMEs from the railway sector and provide solutions to the problems faced by companies when adapting to this new revolution, by creating an organisational mechanism that would help companies in the process of adopting Workplace Innovation. To address the aforementioned challenges, this paper develops the research model for the railway industry, based on the concept of Workplace Innovation and the needs of SMEs. In addition, a general overview of the Innovation Way methodology applied during the workshops of the RailActivation project is presented, as well as the general and specific results obtained in the companies where the Pilot Scheme was applied.

Keywords: Workplace Innovation, Rail, Innovation, open innovation, culture, collaboration & communication

Background

Rail context, RailActivation project

The rail sector is one of the most energy-efficient modes of transport and is responsible for 9% of passenger transport and 7% of freight transport (Tattini & Teter, 2020). At European level, the railway industry has a turnover of 49.2 billion euros and an annual growth rate of 2.3% until 2025 (Schwilling, 2020), which is why we can define the railway sector as a technological, efficient and sustainable sector.

The COVID-19 crisis has made digitalisation become part of the basis on which the railway sector is based, as the pandemic has shown the need to accelerate the technological and non-technological innovations developed to date. The organisational culture of companies in the railway sector must be prepared for a new industrial revolution that will bring with it a new way of adapting demand to supply, in which both technological and non-technological aspects of innovation will play a very important role.

If the railway industry wants to remain competitive during this industrial revolution, it is important that the whole industry, but especially its small and medium-sized enterprises (SMEs), accelerate their technological innovation, and for this it is not enough to apply technologies, it will also be necessary for companies to apply innovation at both organisational and employee levels.

In order to contribute to the solution of this problem the RailActivation project (http://railactivation.eu/the-project/) has aimed to help and provide solutions to the problem faced by companies when adapting to the new technological revolution, this is why its main objective has been to create and pilot an organisational mechanism for the railway sector that would help companies in the processes of adopting Workplace Innovation, with special emphasis on SMEs in the railway sector, in order to create an Open Innovation ecosystem. To address this objective, the specific objectives of the project have been: to study the existing tools, identify and exchange best practices; to suggest a new pilot scheme, including long-term context-based mechanisms to support the adoption of Workplace Innovation by SMEs; to test the pilot scheme; to create an inter-regional network and to raise awareness and disseminate the need for Workplace Innovation.

To address the above mentioned challenges, this paper develops the research model for the railway industry, based on the concept of Workplace Innovation and the needs of SMEs. Improving innovation services and technology development will be more important than ever, and Workplace Innovation (WI) will be a vital part of this process.

The European Commission (EC)[1] states that "to stay at the competitive edge, companies need to invest not only in technological innovation but also in non-technological practices.

[1] https://ec.europa.eu/growth/industry/policy/innovation/workplace_en

Workplace Innovation can mean many things such as a change in business structure, human resources management, relationships with clients and suppliers, or in the work environment itself. It improves motivation and working conditions for employees, which leads to increased labour productivity, innovation capability, market resilience and overall business competitiveness. All enterprises, no matter their size, can benefit from Workplace Innovation." The European Commission considers that Workplace Innovation:

- ➔ improves performance and working lives, and encourages the creativity of employees through positive organisational changes;
- ➔ combines leadership with hands-on, practical knowledge of frontline employees;
- ➔ engages all stakeholders in the process of change;

Workplace Innovation is fuelled by open dialogue, knowledge sharing, experimentation and learning in which diverse stakeholders (who may include employees, trade unions, managers and customers) are given a voice in the creation of new and more participative ways of working (Kesselring *et al., 2014*).

The work of the RailActivation project consortium, in close contact with companies from different sectors and sizes, has over time tested that innovation is at the top of the priority for small and medium-sized enterprises to resist the ever-changing market. In the same way, however, experiences in the field have shown that smaller companies suffer from the lack of an approach to innovation designed for their specific characteristics. Small businesses show difficulty to innovate at the same time, however, being less numerous, they benefit from the speed with which an innovation can spread within the company and quickly improve the approach to the market (Apreda *et al.,* 2010).

Another winning element for business innovation, in the operational support activities for companies, is the issue of "bottom-up innovation", i.e. the importance of involving operators and company staff to generate ideas for improvement. This type of Workplace Innovation is substantiated in the co-creation of ideas for improvement that benefits multiple points of view within the company. The operational view is in fact very often an incessant engine of ideas for improving performance and value proposition in general and even more when there is a collaborative and participatory approach to innovation in the company (Carmassi *et al.,* 2011).
The paper presents an overview of the methodology implemented and the results obtained by the RailActivation Project, which has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 861887.

The RailActivation Pilot Scheme

The RailActivation Pilot Scheme proposed a flexible itinerary that has helped companies achieve greater competitiveness using Workplace Innovation, by means of three strategic blocks from which companies could choose to focus on all three or only on the one(s) they wanted to improve. The Scheme was developed considering the previous work done in the project, in particular, the survey and the survey results.
Based on the research conducted in the project, the following chart was selected as for our approach to WI. These elements were already part of the questionnaire that were used in the survey but have also served as the basis for the pilot scheme. Our scheme has led the companies through an itinerary to understand their situation on WI by focusing on the following three interrelated aspects shown in Figure 1:

- ➔ The employee
- ➔ The Organisation as such and the
- ➔ Approach to technological and market development

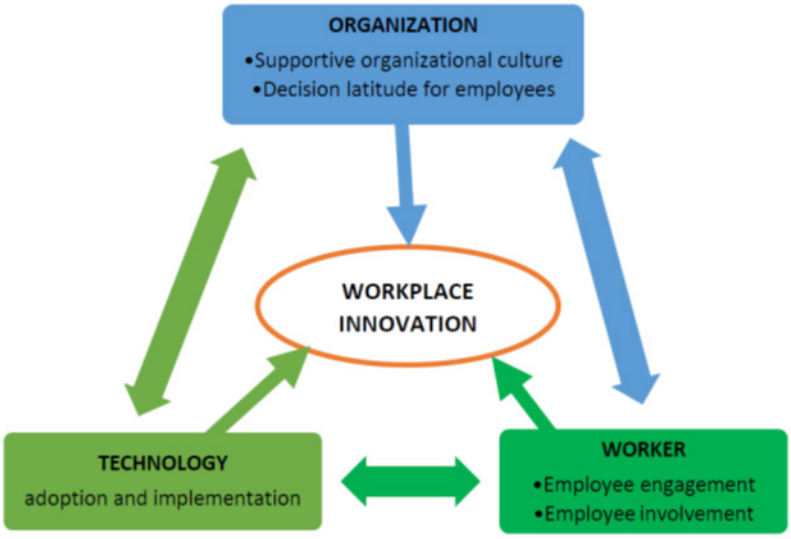

Figure 1-Workplace Innovation Scheme. Source, Project team

The Scheme was based on the following framework:

In the *Block on employees*, companies analysed and addressed aspects directly related to the employees of the company. The main objective was to see how employees felt within a company and to focus on increasing employee engagement and involvement. This block has been considered as the most relevant block by all the companies that have tested the Pilot Plan. Aspects related to the promotion of innovation culture among employees, the development of cross-functional teams, gender issues, training/career development, among others, were evaluated.

The *Block on Organisation* has been focused on those aspects implemented by the company in relation to Workplace Innovation, such as: mechanisms where employees could express and share new ideas and how to implement them; collaborative spaces, a feedback culture, a department or areas in charge of innovation, teamwork is promoted, communication and dissemination policy on innovation, etc.

The *Block on technology and market* dealt with aspects on products/services the company had introduced in the market; innovation in marketing; improvement of communication or information exchange with other companies or institutions; co-development of products/processes with other companies or institutions, sharing of objectives, possible co-operations or alliances, participation in innovation projects, etc.; proactive approach to business; new business practices to organise internal procedures; changes in the use of technology, etc.

Figure 2, presents the RailActivation Scheme Blocks that the company could select to be implemented to improve the Workplace Innovation within their company:

Figure 2-RailActivation Scheme. Source, own elaboration

Innovation Way® path

Starting from the analysis of the context of the SMEs and studying the potential causes that generate critical issues related to innovation in SMEs, QUINN created the suite of Innovation Way® workshops tested with hundreds of companies from different production sectors. The suite consists of a series of four workshops in which, through the explanation and direct application of tools scaled and refocused on the characteristics of small and medium-sized enterprises, a "toolbox" is provided to the companies intending to innovate the way of doing business (Campana & Renucci, 2012).

Through the workshops, the goal was to support the participating companies in:

- ➔ The analysis of their context (internal and external).
- ➔ The innovation of their corporate strategy.
- ➔ Aligning the vision of innovation both from a technical and commercial point of view.
- ➔ Increasing the participants' personal ability to generate new and effective innovative ideas on an ongoing and sustainable basis.

The objectives of the workshops were pursued through practical applications of the tools directly in the classroom and on the participating companies (following the Experience-Based

learning model). This occurred mainly thanks to the use of special templates which provided a complete picture of critical issues and opportunities that allowed participants to be able to take decisions immediately to improve their business.

Figure 3 -Innovation WAY® Structure

Innovation Way® promotes a type of sustainable innovation for medium-small business realities, attributable to the "Business Creativity" approach. This takes the form of workshops where the focus is on improving the business achieved through the recombination of the factors already available in the company.

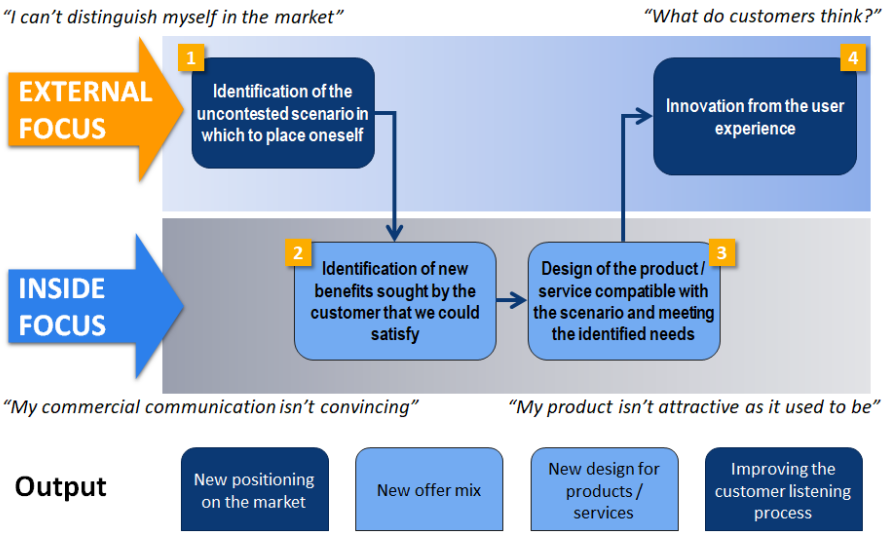

Figure 4 -Innovation Way® path

The whole structure of the workshops only has an impact if the actors involved in generating improvement ideas are at the centre of the process. This is achieved by letting the Innovation Way® participants, during the activities, constantly put themselves on the "front line" by overturning the concept of traditional training and letting the company staff present in the workshop get involved, generate ideas, give feedback and test the toolbox by using their

knowledge and experience to model each tool presented to their business needs. Each participant becomes an active part of the path and literally "learn by doing" by using the tools according to their objectives and personal background, generating innovative ideas "tailored" to their business (Petrini *et al.,* 2019).

However, Innovation Way® workshops add to the "individual" learning an additional element that generates value for the participants: the sharing and co-creation of ideas. This is done through teamwork sessions and through the shared presentation of results. This allows people with different expertise to simultaneously participate in the generation, questioning and refinement of ideas, obtaining a "finished product", the result of different points of view and often created by "multiple hands", providing a brief internal first efficacy check. To achieve this effect, the moments of practical application of the contents, which occupy about three quarters of the activity, are carried out in teams made up of "similar" companies and then shared with the rest of the participants, this makes it possible to obtain a first step of "creating participated in ideas", and a second "cross-check" step with the rest of the participants to obtain constructive feedback and further refine the idea.

RailActivation project Methodology

Within the RailActivation Pilot Scheme the idea was to test this Pilot Scheme within the project implementation, and for this it was decided to implement it on the Workshop that followed the Innovation Way® Methodology. The structure of these workshops has been a combination of theory and practice, with much more time invested in the practice and with a very clear approach towards the "learning by doing" philosophy. Some of the intended benefits of active learning were as follows: develop collaborative skills; encourage risk taking; participants' preparation; increase engagement; improve critical thinking; makes technology more powerful; spark creative thinking and foster real problem solving (Petrini, 2021).

This evaluation and testing phase corresponded to the evaluation of the RailActivation mechanisms and tools with SMEs. For this reason, meetings were organised with SMEs and testing workshops were held to confirm the pilot scheme works for rail sector, receive feedback and raise interest on the implementations.

The idea in testing the Scheme was to involve some members of the small team devoted to Workplace Innovation in the companies, if possible, to the Innovation Way Workshops. Once back in the company they could be able to spread the knowledge of the tools and methodologies learned among the other members of the company team but also among colleagues of the company supporting their adoption and increasing the possible impact in terms of Workplace Innovation. On this basis the Pilot Scheme could be fine-tuned.

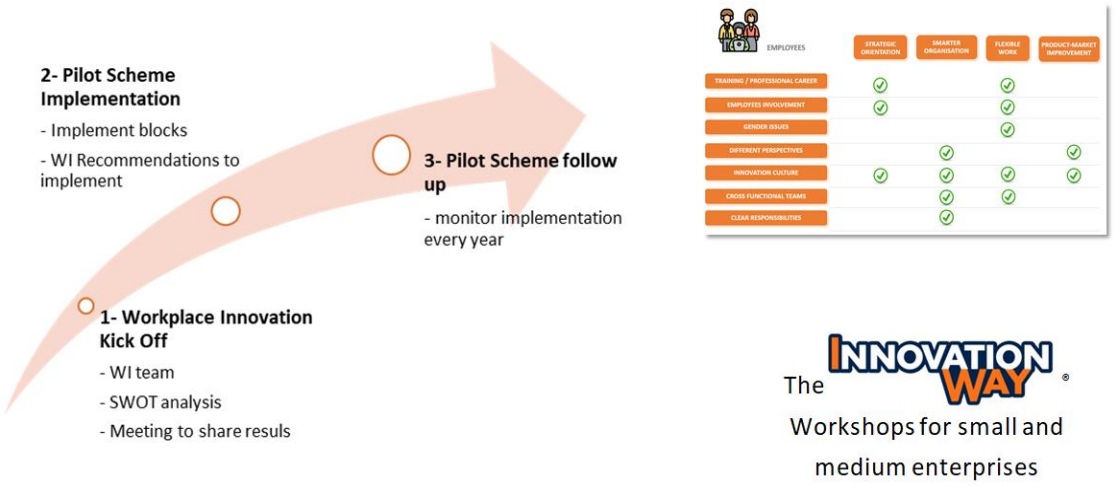

Figure 5 - Pilot test of the scheme in Innovation Way workshops

Workplace Innovation (WI) is a practice or combination of practices developed and implemented that either structurally (through division of labour) or culturally (in terms of empowerment of staff) (Oeij *et al.*, 2015)

➔ enable employees to participate in organisational change and renewal and hence
➔ improve the quality of working life and organisational performance

The combination of the four main factors makes the basis for the most effective Workplace Innovation environment:

1. Empowering jobs and self-managed teams.
2. Flexible organisational structures, people-centred management practices and streamlined systems and procedures based on trust.
3. Systematic opportunities for employee-driven improvement and innovation.
4. Co-created and distributed leadership combined with 'employee voice' in strategic decision-making.

During the Innovation Way® workshops in which the Pilot Scheme was tested, we worked on these factors:

- providing an engaging learning experience regardless of the participant's function, which encourages protagonism and proactivity;
- creating opportunities for sharing and developing a common culture of innovation;
- achieving results already in the course of classroom activities so as to give confirmation to participants on the effectiveness and applicability of the proposed methodologies.

In relation to the three steps suggested for the implementation of the Scheme and as described in Figure 1, several activities were realised correlated to the Innovation Way Workshops.

Step 1. Workplace Innovation Kick off

The initial situation of the company regarding Workplace Innovation was checked by the way of:

- Filling a specific questionnaire during the application phase;
- Realising specific distance meetings carried out directly by specialists involved in the setup of Innovation Way approach.

Outputs of this step were:

- Define with the company the composition of the team that would participate in the Workplace Innovation workshops.
- Collect the necessary information to adapt the Innovation Way methodology and tools to the characteristics of the companies.

The contents of the individual workshops were reviewed and focused on the basis of the information collected, developing new releases of templates to be used during group work and key elements for the transfer of know-how through the application of the learning-by-doing approach.

This information was synthesized in a SWOT analysis matrix structured as detailed in the next figure. The reference model has been applied to each selected company that shows the SWOT analysis of each of the companies that actually took part in the workshops elaborated according to the Pilot Scheme Methodology.

The adoption of a common model allowed to elaborate indicators with reference to four areas of attention that helped to interpret the flexibility adopted by the companies in reference to Step 2:

1. Strengths/opportunities (area of development):
2. Weaknesses/threats (area of criticality):
3. Strengths/threats (advocacy area):
4. Weaknesses/opportunities (area of improvement):

		Opportunities				Threats			
		Digital trasformation	Post pandemic public investments	Open innovation networks	Distance training solutions	Entrance new competitors	Employee turnover	Digital trasformation	Products / Services obsolescence
Strengths	Workplace Innovation adoption								
	Employee's autonomy								
	Employee's engagement and proactivity								
	Central role of women in the company (=>50%)								
	Equality plans implemented								
	Implementation Innovative solutions								
	Relevant (>25%) n. Employees involved in innovation								
Weaknesses	Initial approach to Workplace Innovation								
	Reduced Employee's autonomy								
	Employee's reactive approach								
	No central role of women in the company (<50%)								
	No equality plans implemented								
	No implementation Innovative solutions								
	Reduced (<25%) n. Employees involved in innovation								

Figure 6 - Model of SWOT analysis.

The results of the above indicators are shown in the table regarding the three editions of Innovation Way, each structured in four workshops. A high percentage of indices one and three indicate a business context on paper favourable to the WI adoption path. This can be seen in the figure below:

		EDITION I							EDITION II				EDITION III						
ID	AREAS OF ANALYSIS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Strengths/opportunities (area of development)	32%	36%	50%	54%	39%	50%	57%	68%	36%	82%	43%	39%	68%	29%	68%	25%	25%	64%
2	Weaknesses/threats (area of criticality)	43%	39%	25%	21%	36%	29%	21%	11%	39%	11%	32%	36%	11%	43%	11%	46%	46%	14%
3	Strengths/threats (advocacy area)	29%	32%	46%	50%	36%	43%	50%	61%	32%	71%	39%	36%	61%	29%	61%	25%	25%	57%
4	Weaknesses/opportunities (area of improvement)	50%	46%	25%	29%	43%	32%	25%	14%	46%	7%	39%	43%	14%	54%	14%	57%	57%	18%

Figure 7 - Comparison of SWOT analysis results

Step 2. The company will implement the Pilot Scheme and provide recommendations for action

With reference to the three blocks of the RailActivation Scheme, and the related key aspects of each of them the companies participated in the Innovation Way workshops with a flexible approach i.e.:

- involving different functions according to specific characteristic;
- participating in the most suitable workshops according to their needs.

The RailActivation Pilot Scheme flexible itinerary, where the company could check and jump on the specific block they needed to improve, has been supported by the Innovation Way Workshops for their capability, in terms of content and methods, to match the key factors of the three blocks proposed by the Pilot Scheme. The next matrix shows this conceptual matching:

Block 1: Employee	WS 01	WS 02	WS 03	WS 04	Block 2: Organisation	WS 01	WS 02	WS 03	WS 04	Block 3: Technology and market	WS 01	WS 02	WS 03	WS 04
Innovation culture among employees					Support for sharing ideas					Identify the new product/services				
Cross functional teams					Generational change					Marketing innovation				
Different perspectives					Assess new ideas from employees					Improve communication or information sharing				
Gender issues					Implement employees' ideas and suggestions in a fast and regular way					Co-Development product/ processes				
Training / Professional career					Suggest rewards to employees					Proactive approach to business				
Involve employees					Collaboration space					Benchmarking in a systematic way				
Clear responsibilities					Communication or information sharing					collaborative information sources				
					Feedback culture					New business practices				
					Records of their good work practices					Review and reformed the logistics, delivery, ..				
					Departments or areas in charge of innovation					Review the production costs strategy				
					Work Teams					Changes in the use of Technology				

Figure 8 - Matching key factors vs Workshops contents

Step 3. A follow up suggested every year

In the experimental application implemented as part of the project, outcome monitoring has been achieved through a combination of several actions:

1. provision of a follow-up questionnaire;
2. sample interviews with participants;
3. organisation of a specific webinar the 29th of June 2021 dedicated to the sharing of results and the presentation of testimonials from some of the companies involved.

RailActivation project experience of companies

Within the RailActivation project, which aimed to create and pilot a rail business and organisational mechanisms for the uptake of Workplace Innovation by SMEs in the railway sector as part of an Open Innovation ecosystem, the Innovation Way path was proposed with the following adaptations:

1. delivered in three editions in order to facilitate the participation of companies in relation to their own agendas and to activate a fine-tuning process derived from comparison between one edition and another;
2. for the same reason as indicated in the previous point, a concentrated two-day suite format was proposed;
3. the adaptation was carried out remotely via the Zoom platform, with the resulting revision of time and operational support for group work.

18 SMEs from Spain, Italy, Germany, Greece, Romania, UK, mainly manufacturing companies and solution providers for the railway network participated in the Innovation Way Workshops. The following graphical representations aids a comparative analysis of the data from the three editions as a function of the categories of participants: roles and company functions.

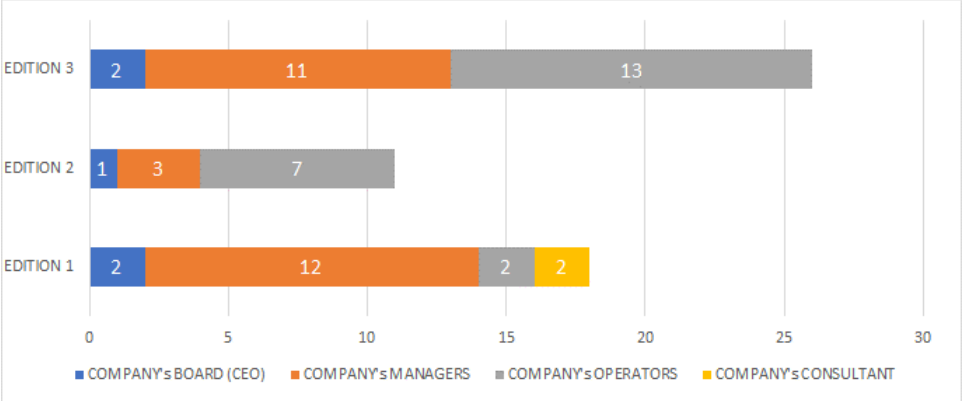

Figure 9 - Participants' Categories

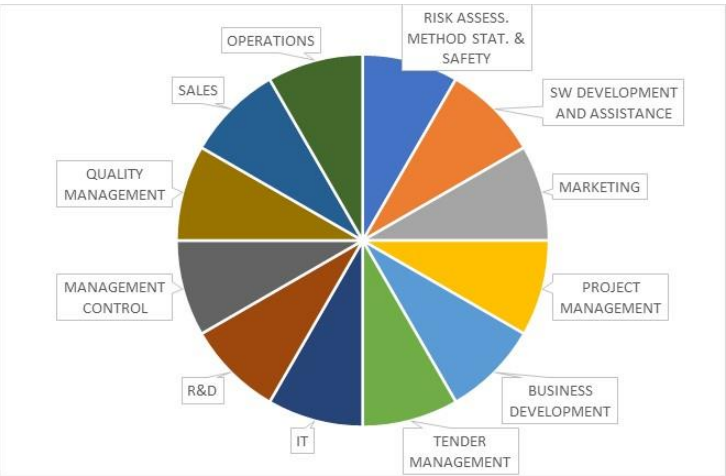

Figure 10 -Participants' functions

The proposed methodologies were introduced to the participants so that they could be understood and applied regardless of the technical background: participants could thus feel and act as protagonists of the innovation process.

The analysis of the preferences of the participants of the three editions summarized in the following figure highlights in general terms the particular interest on WS 02 (focused on Identification of new benefits sought by the customer that we could satisfy) and 03 (focused on new design for products / services). The second edition stands out for its concentration on WS 02 and 04 (Improving the customer listening process). Moreover, the first edition highlights the interest in WS 01 (New positioning on the market), consistent with the more significant involvement of executive roles, but

at the same time proposes data distributed over all four WS, again a sign of a greater ability to have a holistic view of corporate interests.

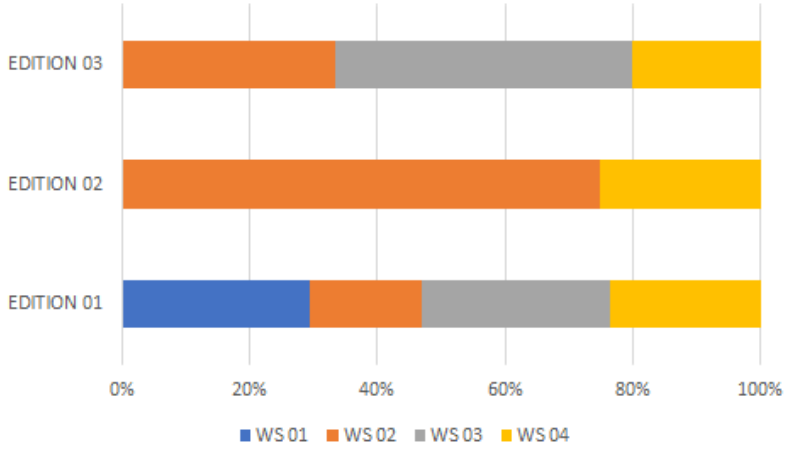

Figure 11 - WS preferred by the participants of the three editions

For those who make a product or a service it is easier to think about its features, but it is necessary to be able to communicate to the customer what benefits they can obtain from the use of that product. One of the first and most appreciated approaches also transferred to the companies participating in the workshops was precisely to learn how to speak the language of the benefits that their solutions can bring to customers. To this end, specific exercises were carried out on this subject with moments of exchange and comparison between the participants.
The analysis of data and information have confirmed that the features of Innovation Way that have enabled the adoption of Workplace Innovation have been that:

- employees of *each function can participate* with a variable level of protagonism because it is related to the aims of the different workshops,
- *each participant can contribute* to the work of the groups regardless of their role or age, particularly if the participant is part of a workgroup with colleagues,
- *the transferred methodologies can be reused* in their own work context independently,
- the methodologies *can be used in a recurring way* when a need arises,
- the various editions of the workshops show that the best results are obtained if *several business functions of the same organisation* are involved,
- innovation goes beyond the boundaries of technical functions and becomes *shared heritage*.

Four to five months after the workshops, interviews were conducted with a sample of participants, it was intended to monitor the outcomes of Innovation Way Workshops delivered during November-December 2020. It became clear that there is a direct correlation between the quality and richness of the works produced during the workshops and their capitalization as management know-how to be used in the business context. The companies that participated extemporaneously or with a reduced number of resources indicated the need for further consulting interventions to integrate the methodologies presented and tested.

The obstacles that have emerged to the acceptance of the proposed approach are the following:

- the involvement *only of technical profiles* focused on product innovation
- *reduced recognition of the value* of communication & management
- *focus on tasks* and less on getting as complete an overview as possible

In order to get to the bottom of the productivity of the participation in the workshops of the various companies in terms of adherence to the proposed innovation process, the information collected has been summarized in the following matrix. In particular, the matrix contains data relating to:

- N. WP ATTENDED

- N. PARTICIPANTS
- N. ORIGINAL OUTPUTS

Therefore, 3 indexes were calculated:

- Index 1: Average value of the three parameters
- Index 2: Ratio between the number of original outputs produced and the number of participants.
- Index 3: Normalisation of the ratio between the number of original outputs produced in relation to the number of Workshops (WP / WS) followed.

I EDITION	N. WP ATTENDED	N. PARTICIPANTS	N. ORIGINAL OUTPUTS	INDEX 2 - OUTPUTS / PARTICIPANTS	INDEX 3 - OUTPUTS / PARTICIPANTS / N. WPs
COMPANY 1	2	3	2	0,3	0,3
COMPANY 2	4	2	1	0,5	0,1
COMPANY 3	4	3	3	1,0	0,3
COMPANY 4	4	1	1	1,0	0,3
COMPANY 5	4	3	2	0,7	0,2
COMPANY 6	2	3	1	0,3	0,2
COMPANY 7	2	2	1	0,5	0,3
INDEX 1 - AVERAGE VALUE	3,1	2,4	1,6	0,6	0,2

II EDITION	N. WP ATTENDED	N. PARTICIPANTS	N. ORIGINAL OUTPUTS	INDEX 2 - OUTPUTS / PARTICIPANTS	INDEX 3 - OUTPUTS / PARTICIPANTS / N. WPs
COMPANY 8	2	2	1	0,5	0,3
COMPANY 9	4	4	4	1,0	0,3
COMPANY 10	4	1	3	3,0	0,8
COMPANY 11	4	2	4	2,0	0,5
INDEX 1 - AVERAGE VALUE	3,5	2,3	3,0	1,6	0,4

III EDITION	N. WP ATTENDED	N. PARTICIPANTS	N. ORIGINAL OUTPUTS	INDEX 2 - OUTPUTS / PARTICIPANTS	INDEX 3 - OUTPUTS / PARTICIPANTS / N. WPs
COMPANY 12	4	4	3	0,8	0,2
COMPANY 13	4	3	2	0,7	0,2
COMPANY 14	3	2	2	1,0	0,3
COMPANY 15	4	1	2	2,0	0,5
COMPANY 16	4	3	3	1,0	0,3
COMPANY 17	4	3	3	1,0	0,3
COMPANY 18	2	1	2	2,0	1,0
INDEX 1 - AVERAGE VALUE	3,6	2,4	2,4	1,2	0,4

Figure 12 - Productivity indexes

The first consideration we can make is that *each participating company has produced at least one original output that can be used in its own context* as proof of the effectiveness of the proposed methodologies. This is also valid for the first edition where, as anticipated, having organised the work groups to an inter-company logic could have limited the protagonism of some participant.

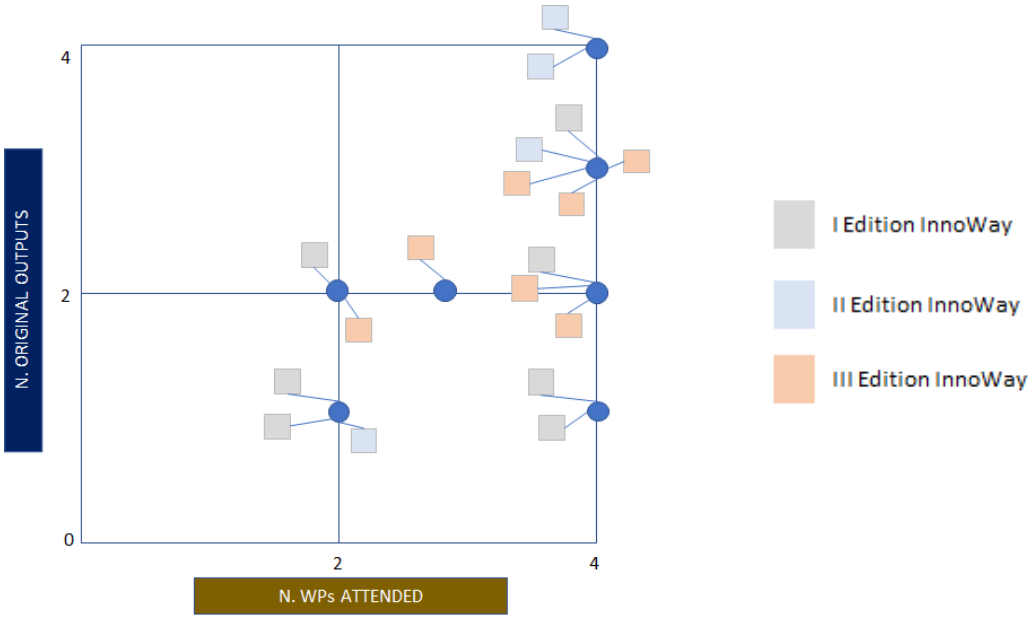

Figure 13 - Productivity map

As summarized in Figure 13, in which the participation rate is related to the number of original outputs produced by each company, the productivity of firms in Editions II and III was higher than those in Edition I (Index 2). This superiority in productivity is more limited when compared to the number of workshops attended (Index 3). In fact, it should be remembered that belonging to different functions meant that participants, particularly those with higher levels, concentrated on certain WPs. The significant results of Edition II (an average of three outputs per company) should also be interpreted in light of the lower number of participating companies (4) of which three out of four followed all the WPs.

In order to facilitate a comparative reading of the results of the three editions, the data from *Index 3 (OUTPUTS / N. PARTICIPANTS / N. WPs)* is presented on the x-axis in scatter graphs.

In the first edition (Figure 14), dispersion is lower than in the other two editions (Figure 15, 16), in which there is at least one case of firms with a very high level of productivity. Excluding these cases of best performers in II and III, the average productivity of the three editions are remarkably close.

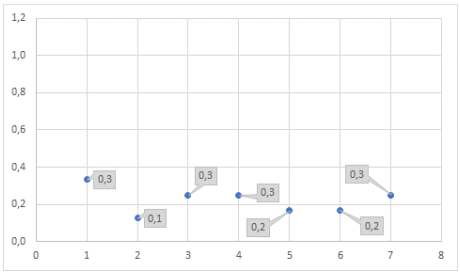

Figure 14 - EDITION I – Index 3 scatter graph

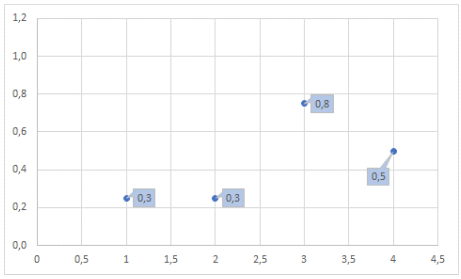

Figure 15 - EDITION II – Index 3 scatter graph

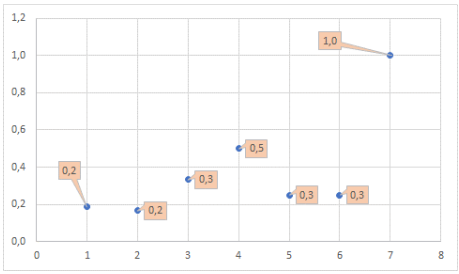

Figure 16 - EDITION III – Index 3 scatter graph

The search for correlations between the starting condition photographed through the SWOT analysis and the results obtained during the workshops has not allow us to identify univocal causalities but rather differentiated conduct.

		EDITION I							EDITION II				EDITION III						
ID	AREAS OF ANALYSIS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Strengths/opportunities (area of development)	32%	36%	50%	54%	39%	50%	57%	68%	36%	82%	43%	39%	68%	29%	68%	25%	25%	64%
2	Weaknesses/threats (area of criticality)	43%	39%	25%	21%	36%	29%	21%	11%	39%	11%	32%	36%	11%	43%	11%	46%	46%	14%
3	Strengths/threats (advocacy area)	29%	32%	46%	50%	36%	43%	50%	61%	32%	71%	39%	36%	61%	29%	61%	25%	25%	57%
4	Weaknesses/opportunities (area of improvement)	50%	46%	25%	29%	43%	32%	25%	14%	46%	7%	39%	43%	14%	54%	14%	57%	57%	18%
A	N. WP ATTENDED	2	4	4	4	4	2	2	2	4	4	4	4	4	3	4	4	4	2
B	N. ORIGINAL OUTPUTS	2	1	3	1	2	1	1	1	4	3	4	3	2	2	2	3	3	2
	PRODUCTIVITY (B/A)	100%	25%	75%	25%	50%	50%	50%	50%	100%	75%	100%	75%	50%	67%	50%	75%	75%	100%

Figure 17 - Correlation between SWOT and WP results

In fact, there are cases of companies, 3, 10, 18, which, starting from a high development area (>= 50%), have a high productivity (>= 75%), a sign of the search for continuous improvement.

Another interesting category is represented by those companies that combine a low area of improvement (=<50%) with high productivity (=>75%). This is the case of 1, 16 and 17. With different interests, these companies take full advantage of the opportunity and bring into the company already usable results.

A third category is made up of companies that record a higher level of productivity despite the areas of analysis with an equivalent weight. 9, 11 and 12 have demonstrated a convinced participation with a cohesive team that is willing to take full advantage of the opportunity represented by the workshops.

For the remaining companies, the situation is spotty. The description of the results obtained is more complete once the analysis on the case studies is included.

The *first case study* focuses on the use of the value curve to define new strategic directions. The original approach of the above-mentioned companies, manufacturer of vehicle components, auxiliary components and system, is to have first approached the analysis from two distinct points of view shown in Figure 18, one from the marketing function and the other

from the technical function, to then initiate a comparison between the two points of view in order to arrive at a shared vision.

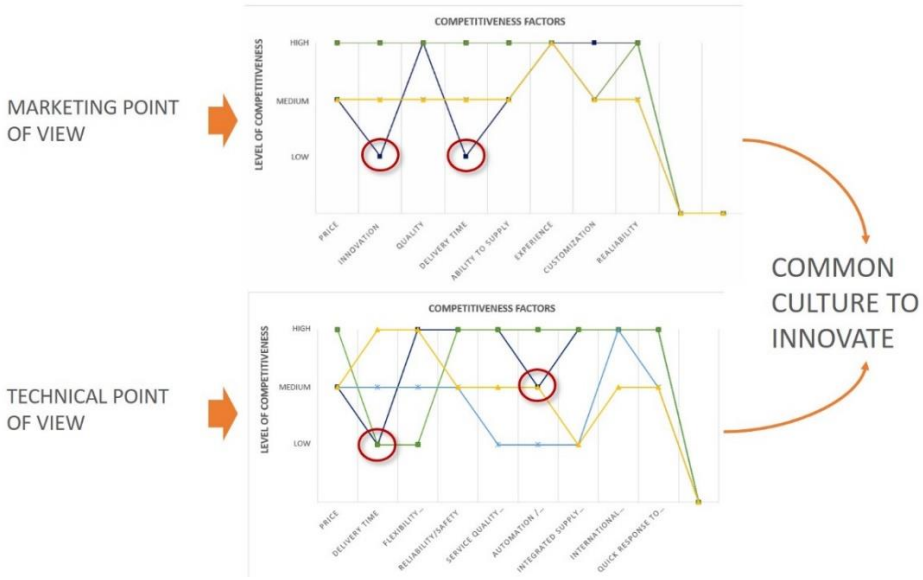

Figure 18- Market and technical analysis

The second case study is representative of the interest registered by several of the participating companies (in particular manufacturing companies) in adopting approaches and methods to improve active listening to customer needs. This translates into the adoption of methods for matching explicit and implicit needs with the requirements of the products and services offered to check gaps and strong assets.

OFFER	BENEFIT	TASK E: try to match needs and benefits list before	NEEDS	CUSTOMER
	BENEFITS THAT SATISFY THE CUSTOMER EXPLICIT NEEDS		EXPLICIT NEEDS: Needs / Wishes / Problems to be Solved	
	1. QUALITY		1. RESPECT SPECIFIC STANDARDS	
	2. RELIABILITY		2. DELIVERY TIMES	
	3. MANAGING SUPPLIERS		3. LOGISTICS SPECIFICATIONS	
	4. DESIGN COLLABORATION		4. COLLABORATION DESIGN	
	5. PROXIMITY		5. MANAGING SUPPLIERS	
0	BENEFITS THAT SATISFY NEEDS THAT THE CUSTOMER DOES NOT SAY, BUT IMPORTANT TO HIM		HIDDEN NEEDS Needs that the customer does not expose but that make the difference in customer satisfaction	0
	1. ENGINEERING KNOW HOW (PROCESS ENGINEERING)		1. SOLVING UNEXPECTED PROBLEMS	
	2.		2. CHEAPER COST OF PRODUCTION	
	3. COST REDUCTION PROPOSALS		3. MANAGING SUPPLIERS	
	4. DESIGN PROBLME SOLVING		4. DESIGN IMPROVEMNENTS	

Figure 19 - Matching of benefits and needs

This was followed by the mapping of customer contact and listening points and the identification of hitherto neglected or unused sources of information as input sources for the

continuous improvement of their offers. In this way, the design process also draws on inputs that were hitherto the prerogative of other functions, according to a classic silos logic.

The last significant experience to be highlighted, *the third case study*, concerns the theme of product innovation. In fact, during Workshop 03 the participants were asked to apply the SCAMPER methodology to one of their products. SCAMPER is a Divergent Thinking technique to generate a large number of ideas for new products starting from their current form or function. Each letter of the acronym contains a set of "idea-trigger" questions that can be used to change the characteristics of a product in order to trigger new ideas. The results, in various cases, was the production of a large number of innovation ideas developed in a few hours as additional inputs to the design process.

SUGGESTION	IDEA-TRIGGER QUESTIONS	Apply the SCAMPER technique to your Products / Services / Facilities with the aim of identifying new solutions	SELECT PRODUCT or SERVICE or ASSET 
Think about substituting part of the product or service or asset with something else.	**1)** What other materials, processes, power, approaches, or forces might I substitute? **2)** What could I substitute or swap to improve the product/service/asset? **3)** What processes or rules could I substitute? **4)** Can I use this product/service/asset elsewhere, or as a substitute for something else?	1) Materials: carbon fiber Swap laptop with Hmi Swap contact sensords for track gauge surveying with a contactless sensor Swap power supply by alternative sources (solar…) 3) Substitute measurement procedure (static) with a continuos method	
Think about combining two or more parts of the product or service or asset to make something new or to enhance synergy.	**1)** What mix, assortment, alloy, or ensemble might I blend? What ideas, purposes, units, or appeals might I combine? **2)** What part of the product/service/asset can I combine with something else? Is there another product or service or asset I could combine this with to create a new offering? **3)** Are there any companies I could collaborate with? **4)** How could I combine talent and resources to create a new version of this product/service/asset?	Add a nest for hand tools transportation Add pedals/engine Add topographic prism for total station Add remote control (drone-like) Add pantograph for contact measurement of the wires Add machine learning algorithms Add more accurate and precise geolocation system	
Think about which parts of the product or service or asset could be adapted or how you might change the nature of the product or process	**1)** What else is like this? **2)** What other idea does this suggest? **3)** What might I adapt for use as a solution? **4)** What might I copy? **5)** Who might I emulate? **6)** How could I adapt or readjust this product/service/asset to serve another purpose? **7)** Is there a new trend I could embrace and adapt to? **8)** What other context could I put your product/service/asset into?	Analysis of information gathered by the cameras (artificial vision) Tunnel without tracks Monitor assets within tunnels Adapt the trolley to be pushed by other track vehicles Adapt the sensors to uncreasing operation speeds Adapt the sensors to monitor viaducts/bridges Adapt BIM Adapt to act as a "exploresr train" (before the real exploresr train)	
Think about changing part or all of the product or service or asset, or distorting it in an unusual way	**1)** What other meaning, color, motion, sound, form, or shape might I adopt? **2)** What might I add? **3)** What could I add to modify this product/service/asset? **4)** Are there elements of the marketing message could I modify? **5)** What element of this product/service/asset could I change to be able to modify the pricing?	Measurement system distance performance (e.g. fog) --> increase the distance of elements Modify lens/camera to take pictures at night	

Figure 20 – Questions developed at the workshops

As part of a specific webinar organized on June 29, 2021, the results achieved by the project were presented and shared with the participating companies and other stakeholders.

In this context, a space was dedicated to the testimony of three companies participating in the II and III edition of the Innovation Way Workshops who were asked to detail the benefits obtained from participation and the impact they had. Below is an extract of the three testimonies:

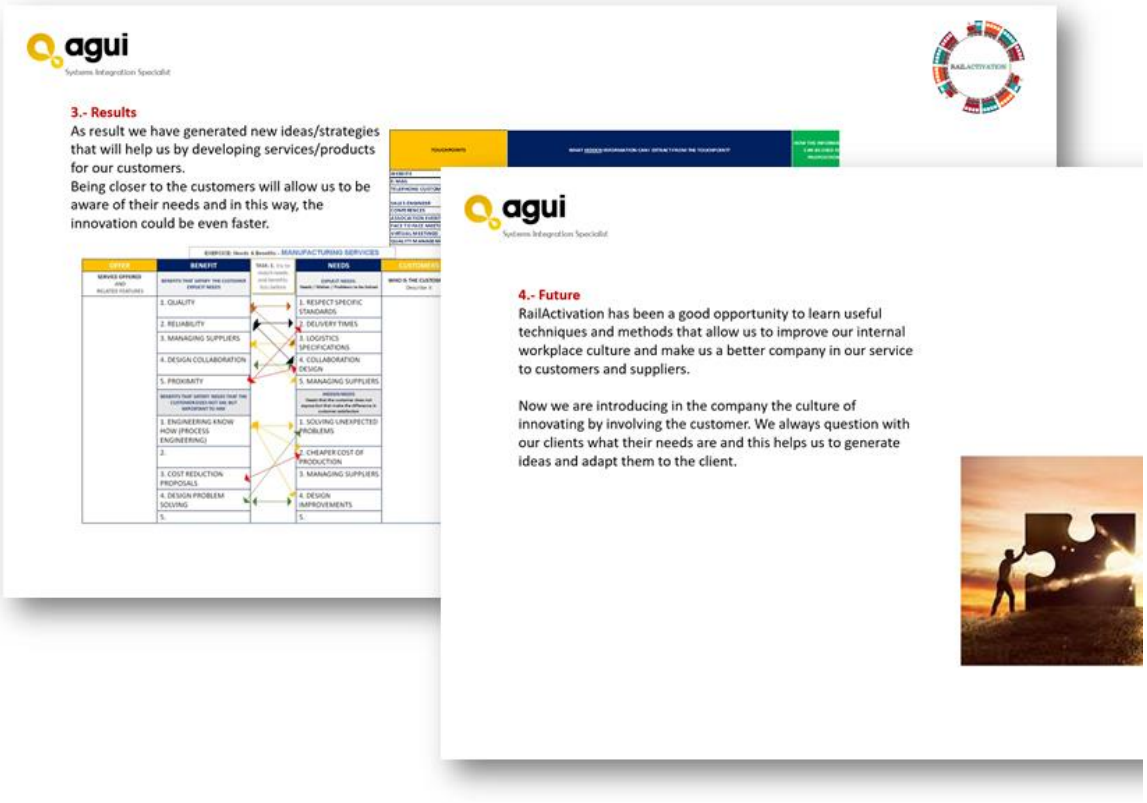

Figure 21 - AGUI feedback

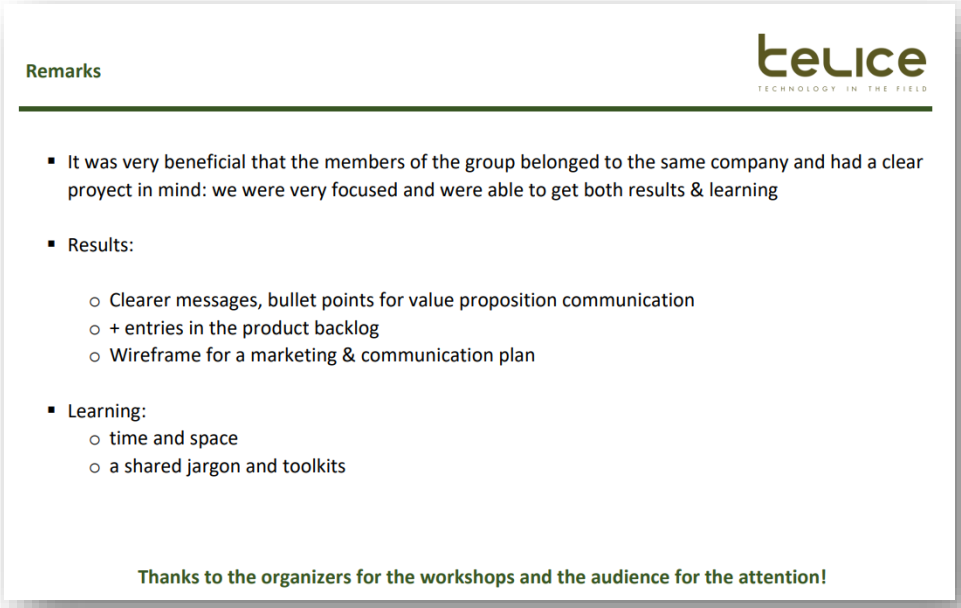

Figure 22 - TELICE feedback

Figure 23 - ELFI feedback

Conclusion

During the project it became clear that Workplace Innovation is not a concept that companies were familiar with as such, but this did not mean that they did not consider it important or that they were not applying it. Through the workshops held during the RailActivation project, the different participating SMEs have been able to develop knowledge and practices to

implement in their companies and to promote WI. It is particularly relevant for the railway sector that companies apply Workplace Innovation as this will generate more competitive companies that will contribute to the growth of the railway sector and promote a more sustainable mobility through Europe.

The Innovation Way methodology implemented in the workshops has enabled employees from different parts of the company to be part of the upcoming changes. In this way companies have been able to engage with different realities and perspectives that have enriched their culture, also a greater contact with customers has allowed them to be more aware of customer needs, so that they can innovate more easily and more quickly. RailActivation has been a great opportunity for companies to learn useful techniques and methods to improve their internal working culture, improving their ability to offer services to their customers and suppliers.

After the workshops, the companies have been applying the lessons learned in the workshops in their own companies. Since the workshops 64% of the participants have time allocated to the promotion of activities related to the culture of innovation.

A very important aspect of the workshops was the participation of staff from different departments, as the different points of view and the different experiences of each of them have enriched the workshops by being able to share them with the other participants. This is why it is important that in company's employees from different departments work together, in 84% of the participating SMEs the different areas collaborate on certain tasks.

Furthermore, the active training of employees generates companies that are constantly innovating as they are aware of the latest market trends and the available processes. 82% of the employees of the participating SMEs are encouraged by the companies to continue training. When employees know more about the tasks they carry out, they feel more confident and this is reflected in a greater contribution to the company, in the form of suggestions or comments on improvements to be made. All the participating companies encourage this aspect among their employees, allowing them to participate as far as possible in decision-making.

After analysing the results obtained, it has become clear that it is important to continue researching the subject and to promote Workplace Innovation, as this brings great benefits to companies, which in turn improve the competitiveness of the railway sector.

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