DOCUMENT TITLE:

CRITICAL FACTOR
SME DIAGNOSIS REPORT
FOR ROMANIA

Project: Improving RD and business policy conditions for transnational cooperation in the manufacturing industry

Acronym: Smart Factory Hub

Work package	WP3: Benchmark and RIS3 based SFH model definition
Activity	A 3.2: Regional mapping and classification
Deliverable	D 3.2.2: Critical factor SME Diagnosis Report (SDR)
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PU	Public	X
PP	Restricted to other Programme participants	
RE	Restricted to a group specified by the consortium	
CO	Confidential, only for members of the consortium	

TARGET GROUP ASSESSMENT

Has this deliverable addressed any of the target group indicated in the application form?

Yes / No

If yes, please describe the involvement of each individual target group in the table below.

Target group	Number reached by the deliverable	Description of target group involvement
SME	25	SMEs have provided their answers to the questionnaire
Regional public authority		
National public authority		
Higher education and research		
Business support organisation		

CONTENT

1 Introduction

Survey for Romania has been conducted from 20th of March until end of May 2017 and it has been targeted on SME's from the Romania. Close to 300 SME representatives was contacted and the success rate was approximatively 10%. In total we have received a number of 25 completed questionnaires.

| Response rate (?)	Frequency	State	Base: Entered intro
Status	**Frequency**	**State**	
Entered intro	290	100%	
Entered first page	146	50%	
Started responding	53	18%	
Partially completed	53	18%	
Completed	25	9%	
Unit usability (50%/80%)			
Usable units	30	57%	
Partially usable units	2	4%	
Unusable units	21	40%	
Breakoffs			
Introductory breakoffs	237	82%	
Questionnaire breakoffs	28	10% (neto 53%)	
Total breakoffs	265	91%	

The analysis of the results based on the key questions set out in the questionnaire development are presented below.

2 Survey results for Romania

2.1 KEY QUESTION 1: How well are SMEs familiar with the Smart Specialization strategy or related policy and what was their involvement in creating it?

With this measure, the share of SMEs, who are familiar with the Smart Specialization strategy is provided, alongside with the share of SMEs involved in preparing it. Moreover, by summarizing the answers, we are able to determine the share of SMEs involved in preparation of Smart Specialization strategy.

Q3 - Are you familiar with the national Smart Specialization strategy* or related policy initiative defining Smart Manufacturing? *Also known as Smart manufacturing policy, RIS3 strategy, Industry 4.0 policy, Regional Innovation Strategy for Intelligent specialization, Smart Factory.
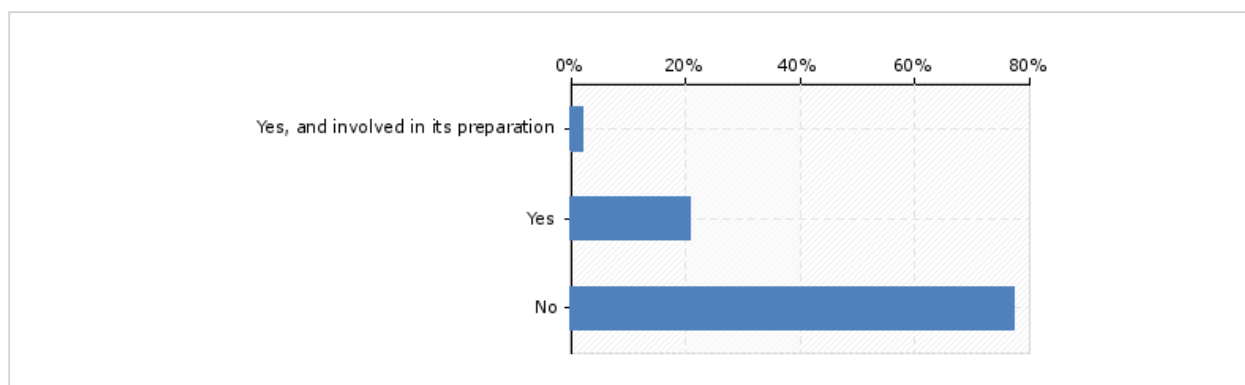
Based on the answers received for the first question we are able to conclude that 80% of companies are not familiar with the Smart Specialization strategy. Only 20% of the companies that answer our questioner are familiar with the strategy.


KEY MESSAGE:
The Smart Specialization Strategy is not well known and recognised by the SMEs, these has not been involved in development of the Smart Specialization strategy


2.2 KEY QUESTION 2: How well is Smart Manufacturing perceived at strategic and spread at operational level (maturity of Smart Manufacturing in the SMEs)?

This measure will give us the answer to the question about how well is Smart Manufacturing understood at strategic level, by giving us the share of SMEs that understand the impact of Smart Manufacturing for their organisation. The second measure is used for determining how well the Smart Manufacturing is implemented in targeted region, by giving us the share of SMEs that currently use Smart Manufacturing systems/solutions in their organisations.

Q4 - Do you understand what are benefits/impacts of ''Smart manufacturing'' for your organization?

Yes (42%)

No (58%)
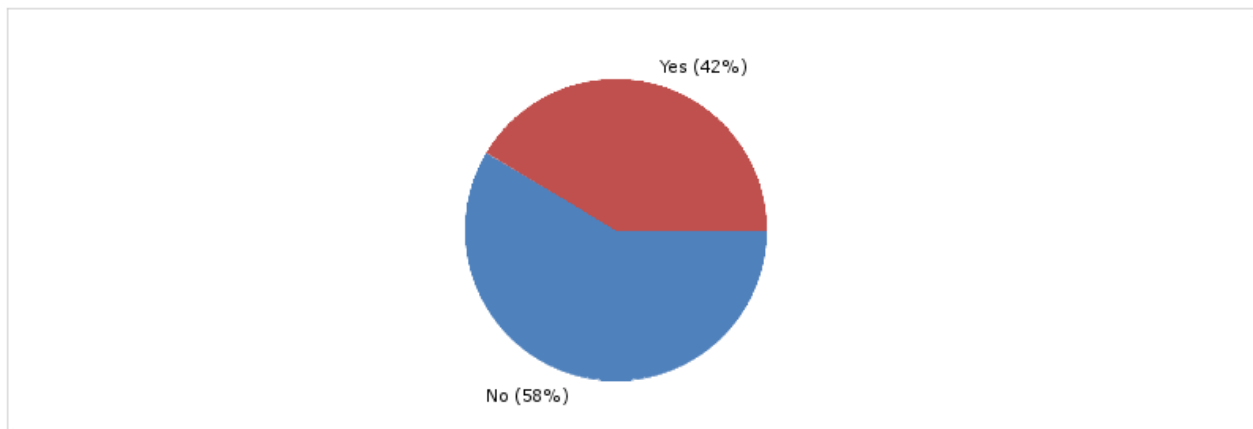
Q6 - Do you currently use Smart Manufacturing systems/solutions in your organisation?

Yes (31%)

No (69%)
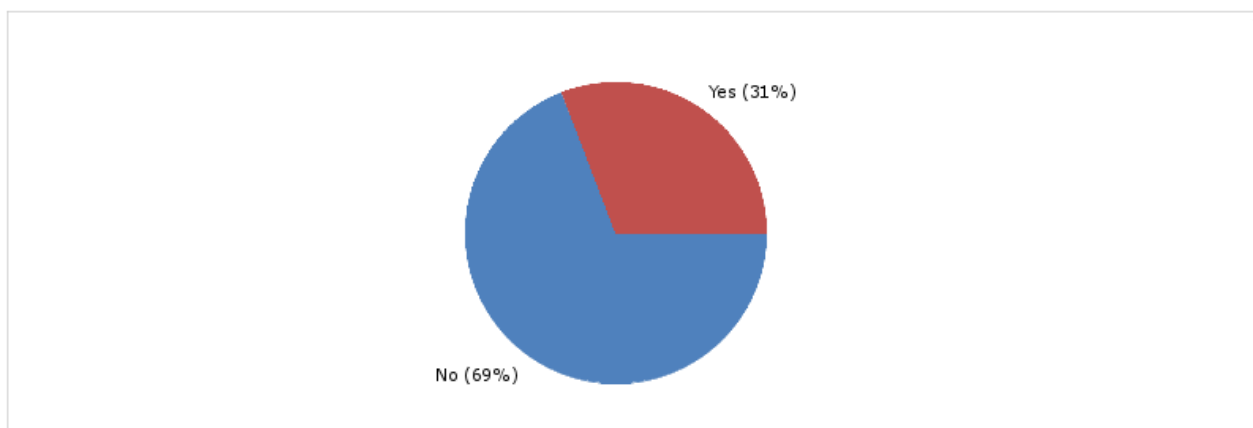
Based on the answers of the question 4 we concluded that 42% of the companies understand the benefits of Smart manufacturing for their organization. A bigger percent of companies (58%) have difficulties in understanding the benefits brought by the Smart Manufacturing systems/solutions. A low percentage of companies, 31%, are currently using Smart Manufacturing systems/solutions within their organization.

KEY MESSAGE:

The Smart manufacturing is not very well perceived among Romanian SMEs, with more than 31% of the companies using Smart manufacturing systems/solutions at the operational level. This percentage will definitely increase in the near future.

2.3 KEY QUESTION 3: What kind of challenges are SMEs facing in implementing Smart Manufacturing technologies and solutions?

This measure is one of the most important ones and will provide information on different challenges and obstacles SMEs are facing in implementing Smart Manufacturing technologies and solutions.

Q7 - What challenges are you facing in implementing Smart Manufacturing technologies?
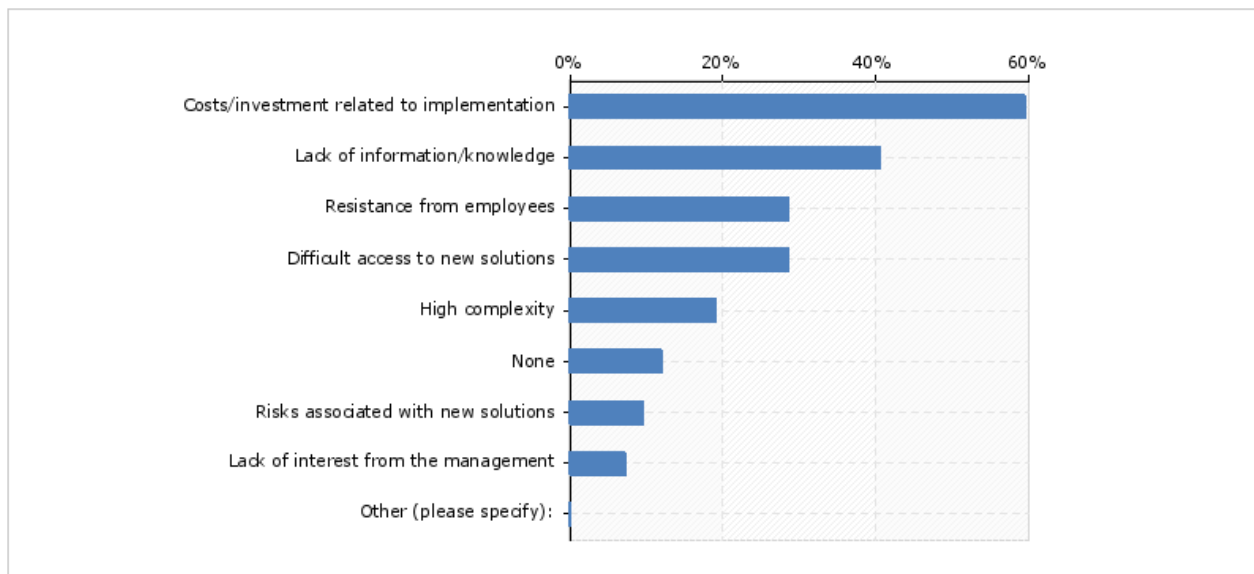
Most organizations (60%) believe that the Smart Manufacturing technologies and solutions are harder to adopt because of their costs/investment related to their implementation. This challenge is followed by the lack of information/knowledge (40%) and the resistance from employees (30%). The same percentage (30%) believes that it is difficult to access new solutions because of the Risks associated with new solutions (10%) and the high complexity (20%) associated with Smart Manufacturing technologies.

KEY MESSAGE:

SMEs are facing a variety of challenges when it comes to the implementation of Smart manufacturing technologies, the most important is related to the investments second by the lack of information/knowledge

2.4 KEY QUESTION 4: Which areas influenced by the Smart Manufacturing are most important for increasing the competitiveness of SMEs.

This measure is providing the overview of areas, influenced by the Smart Manufacturing, for which SMEs believe, will be essential for their competitiveness in the next three to five years.

Q8 - How much do you think the following areas of improvement will be essential for your company's competitiveness in the next three to five years?
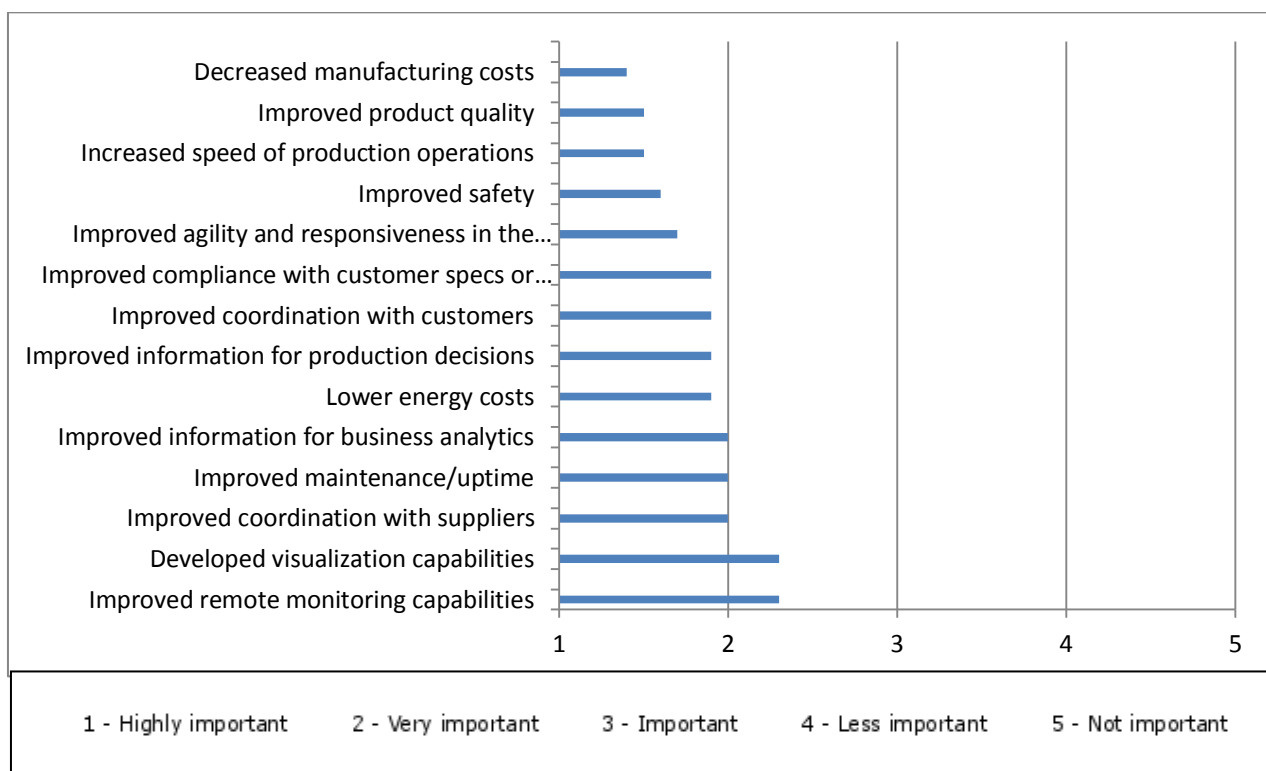
Based on the answers received, we are able to outline that SMEs pointed out few areas which will be of a special importance for their organization in the following years. The most important area will be the decreased of manufacturing costs and improved product quality which is followed by the increased speed of production operations. These results show that the most important focus for SME's competitiveness will be: decreased manufacturing costs, improved product quality, increase speed of production operations, improved safety, and improved agility. Areas like improved remote monitoring and developed visualization.

KEY MESSAGE:
The most influential areas for increasing SME's competitiveness in the future are (i) decreased manufacturing costs, (ii) improved product quality, increase speed of production (iii) and improved safety (iv)


2.5 KEY QUESTION 5: What are the current state-of-art and future plans/strategic orientation for implementation of SMEs in relation to all three areas of intervention?

This measure gives in-depth overview of SMEs current state-of-art and future plans/strategic orientation for implementation in relation to:
- *Novel technologies*
- *Production processes*
- *Human resource management*

This will provide insight and mapping possibility between the existing technologies solutions and good practices and future areas of interest.

Q10 - What kinds of novel technologies are currently implemented in your company?
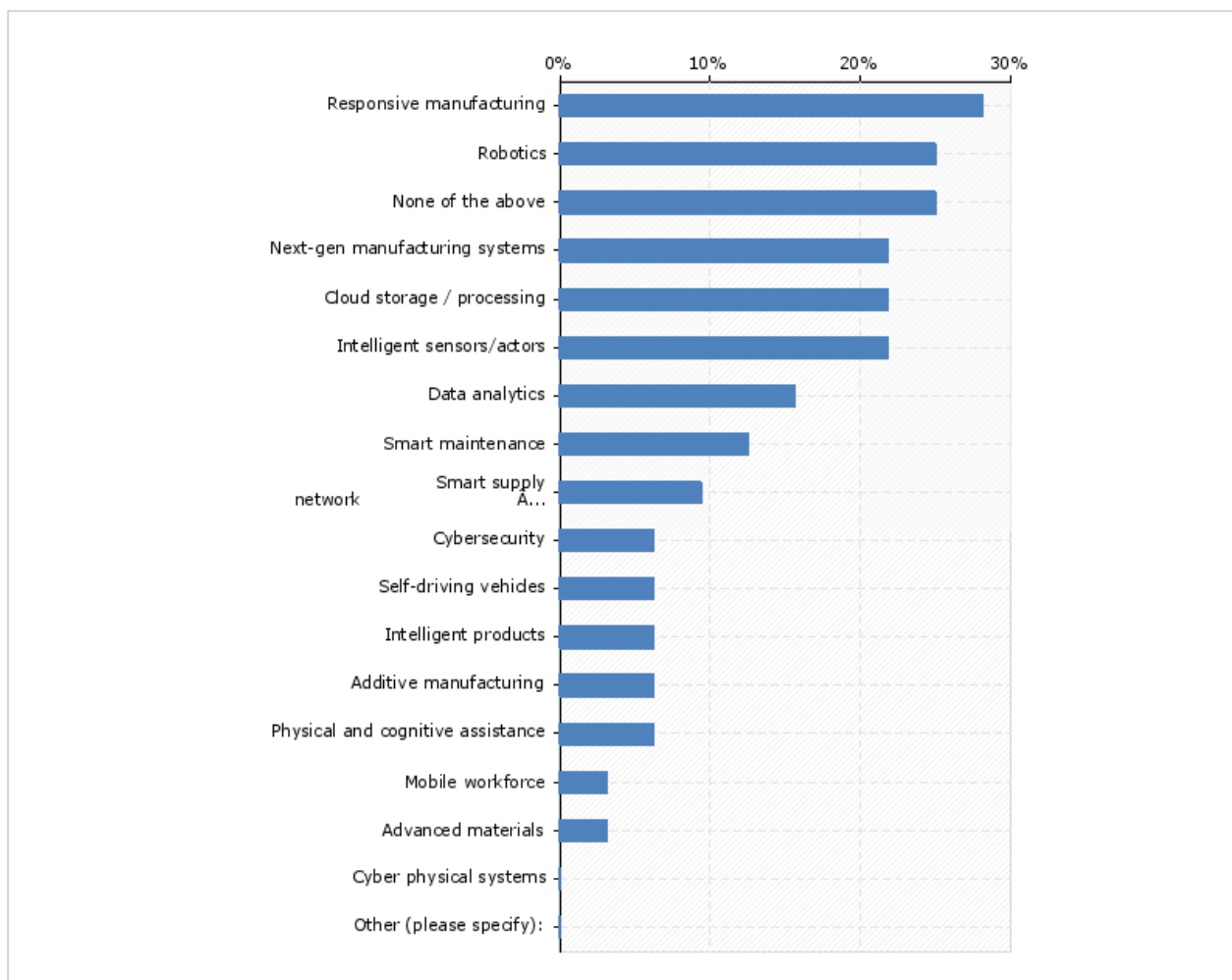

As seen above, 28% of SMEs are using responsive manufacturing. The ones, who do use smart manufacturing are using robotics, next-gen manufacturing systems, cloud storage/processing, intelligent sensors/actors. It is interesting to see however that none of the SMEs replied with cyber physical systems.

Q11 - What kinds of novel technologies are relevant and/or planned to be implemented in the future?
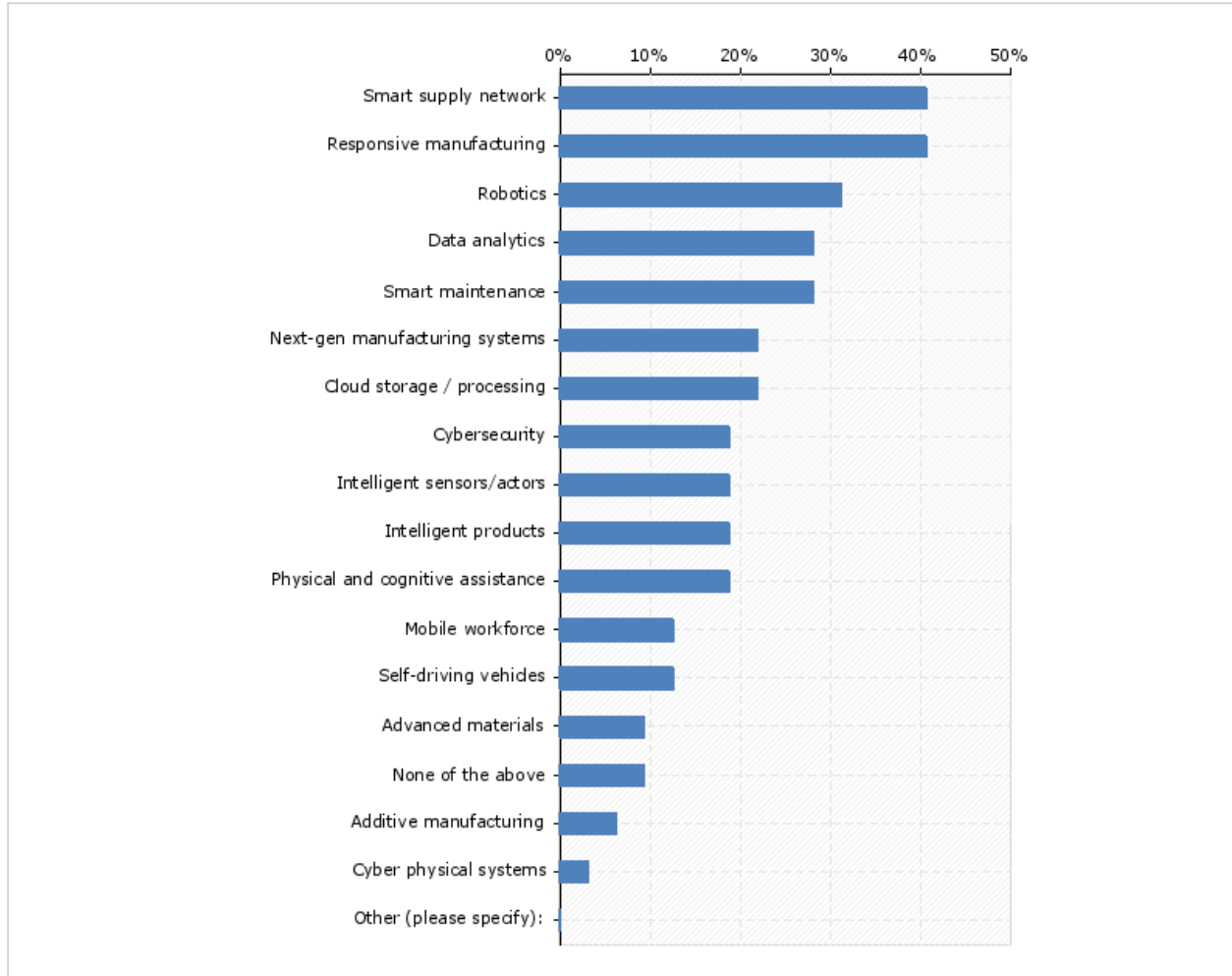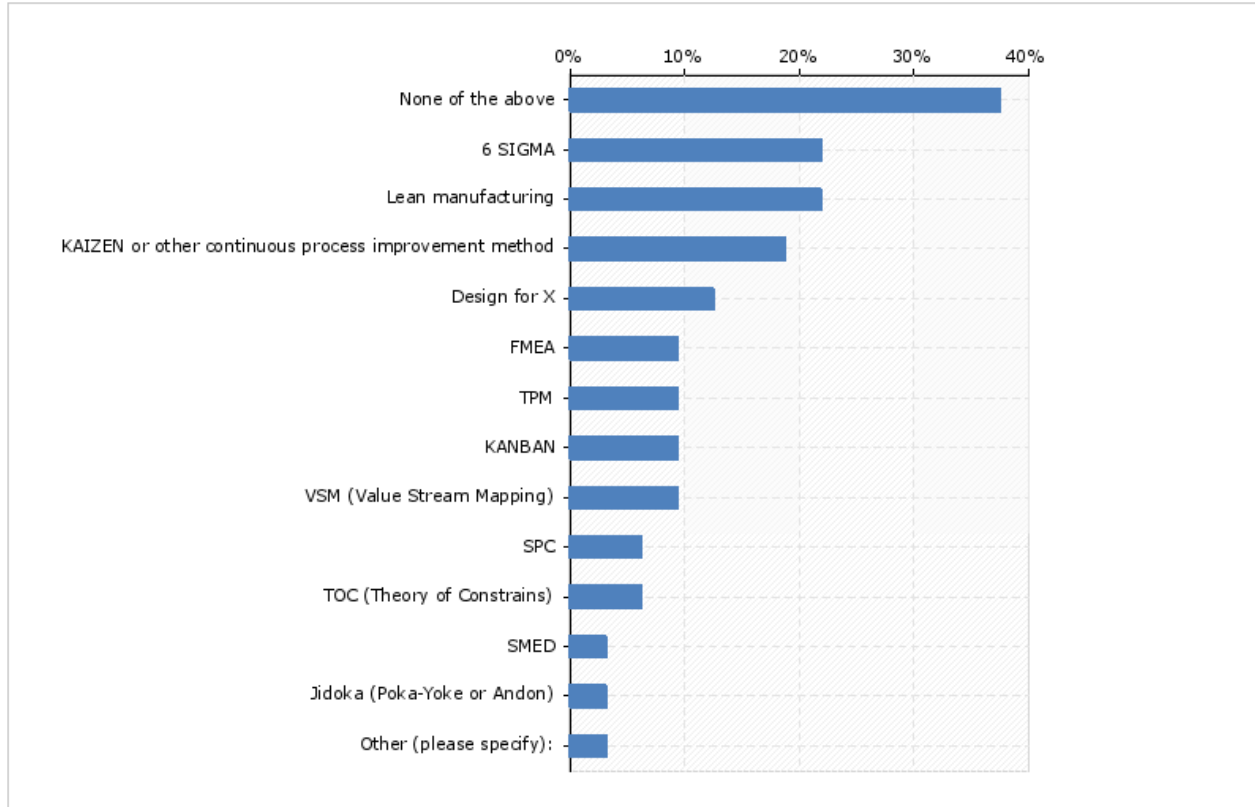

Almost all organizations answered that they are willing to implement at least some new technologies in the future. The most organizations (40%) are planning to implement smart supply networks and the same amount is interested in responsive manufacturing which is followed by robotics (32%). These are the areas that are in the upfront of all the answers from the organization and should be the main orientation for the mapping possibilities in the future.

Q13 - What kinds of solutions/methods related to production processes are currently implemented in your company?
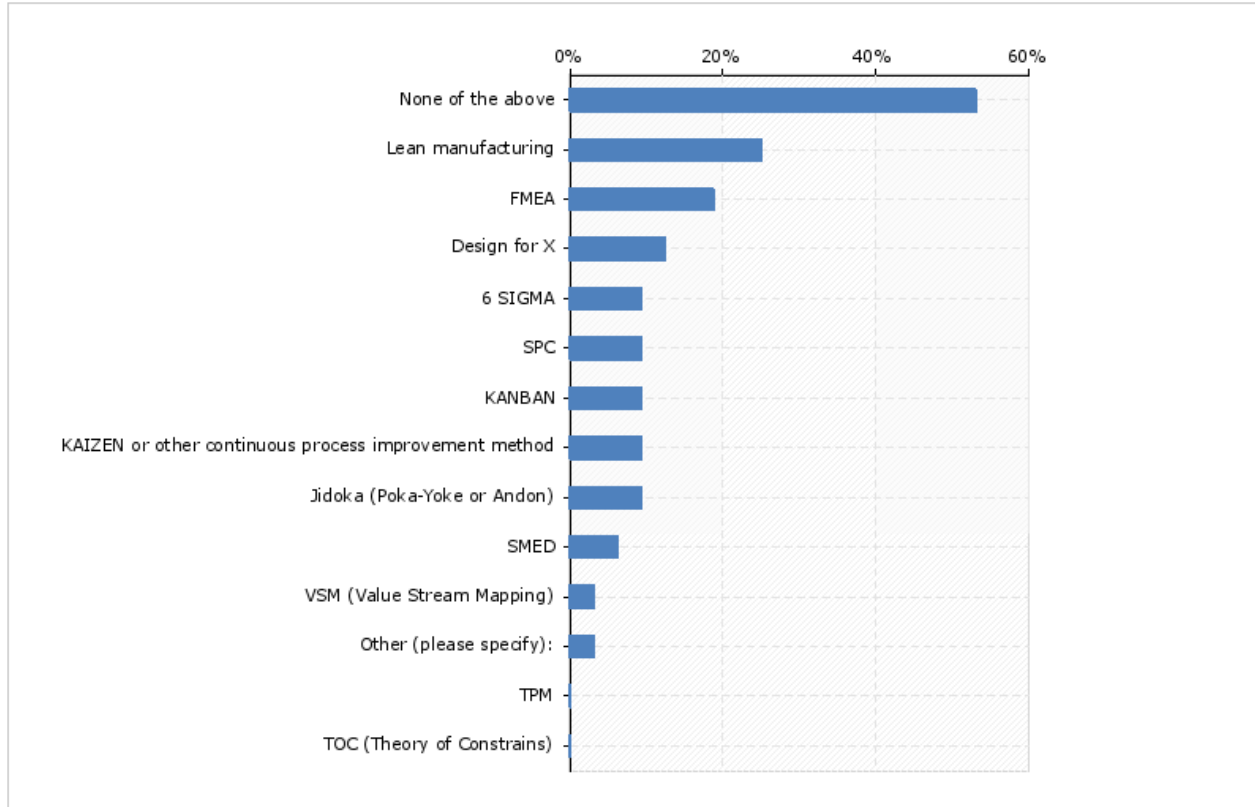

As it can be seen, most of the organizations answered that they are currently not having implemented none of the above systems/solutions. Out of the ones that have implemented new methods most of them have Lean manufacturing (25%) followed by the FMEA (20%). Less than 20% have implemented Design for X. And only less than 10% have implemented 6 Sigma, SPC, KANBAN, KAIZEN, Jidoka, SMED, VSM or other techniques.

Q14 - What kinds of solutions/methods related to production processes are planned to be implemented in the future?


The future plans from organizations are very modest, as majority of the answered that they won't be implementing new solutions/methods for their production process (37%). Out of the ones that will implement new methods the organizations chosen the following 6 SIGMA (22%), Lean Manufacturing (22%), KAIZEN (18%), Design for X(13%), FMEA (9%), TPM (9%), KANBAN (9%), VSM (9%), SPC (7%), TOC (7%), SMED (4%), Jidoka (4%)

Q16 - What kinds of solutions/methods related to human resource management are currently implemented in your company?
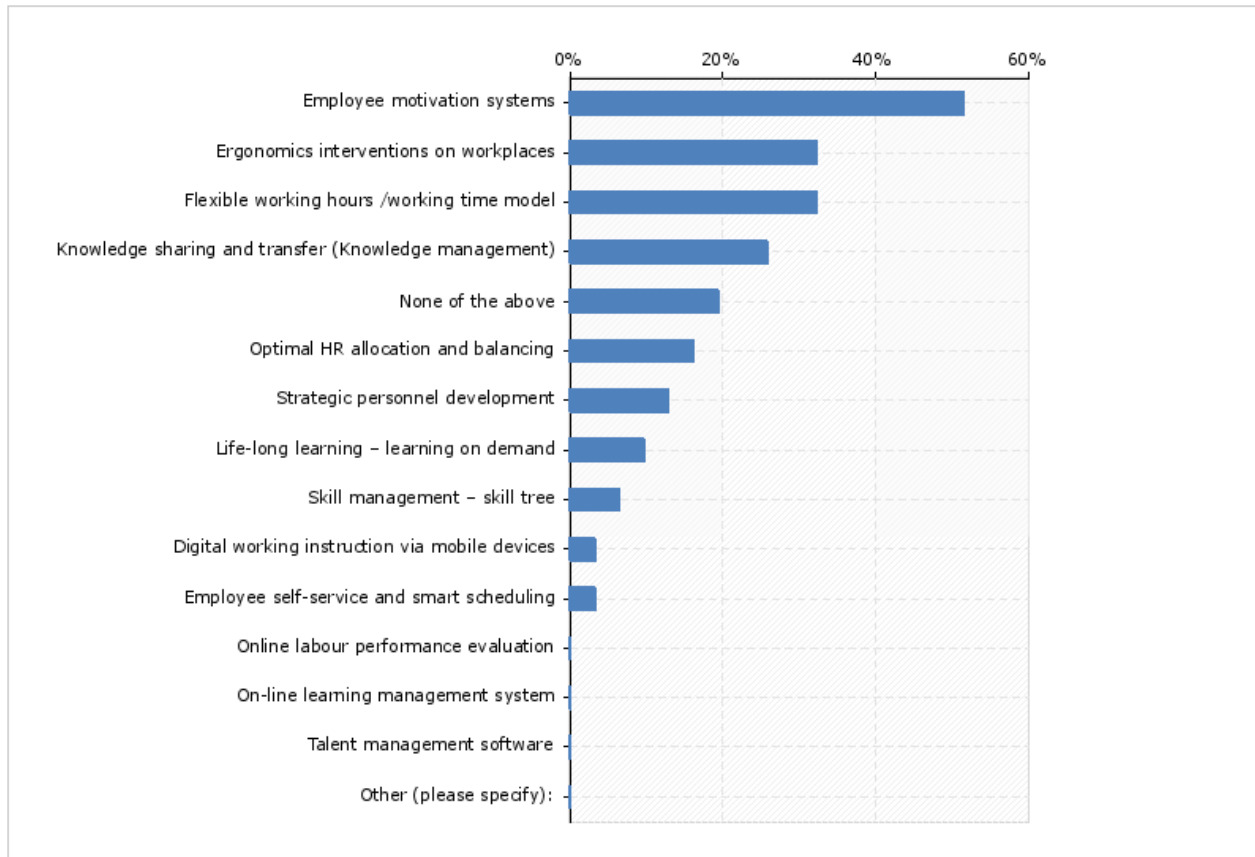
Unlike technologies and production processes, human resources management is already implemented in many SMEs. The most used is the employee motivation system (52%), followed by Ergonomics intervention on workplace (32%) and flexible working hours / working time model (32%). There are 23% of SMEs that are using Knowledge sharing and transfer systems. It is important to note that 20% of SMEs are not using any of the above resource management systems.

Q17 - What kinds of solutions/methods related to human resource management are planned to be implemented in the future?
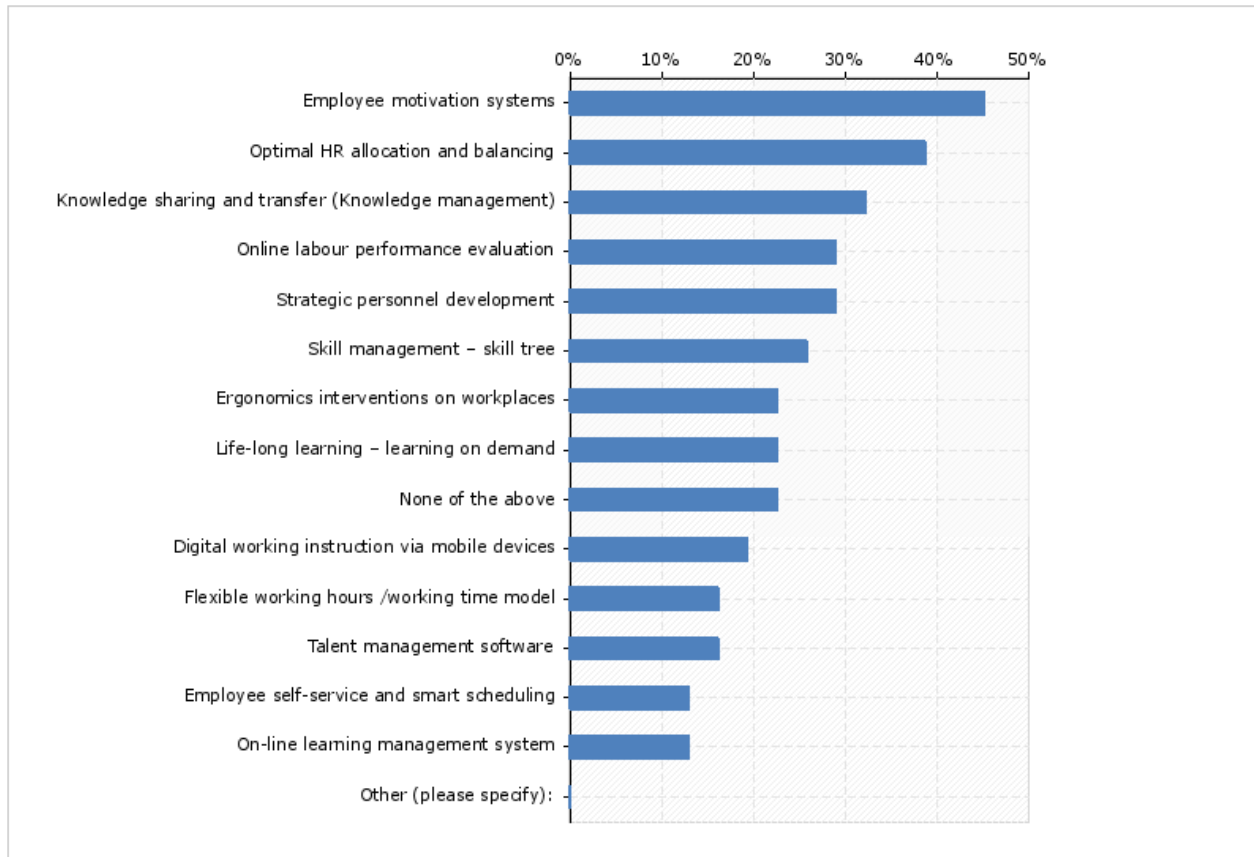
In the future, SMEs will be mostly looking to implement better Employee motivation systems (45%), Optimal HR allocation and balancing (38%), Knowledge sharing and transfer (33%). It is important to note that 28% are interested in the online labour performance evaluation.


KEY MESSAGE:

Around 40% of the Romanian SMEs are currently not implementing any smart manufacturing novel technologies or solutions/methods related to production processes or HR management. The Romanian SMEs have plans to become more active in the future with smart supply networks, responsive manufacturing and robotics being the top three areas of interest. Lean Manufacturing is considered to be the most favourite production process optimisation system and Employee motivation is the most selected HR management system that Is currently implemented and will be improved in the future.


2.6 KEY QUESTION 6: Would SMEs be willing to cooperate, in which areas and at what levels?

This measure will give a share of SMEs that would be willing to cooperate in implementation of Smart Manufacturing technologies and solutions. Moreover, the measure will provide in-depth view on which are the most favourable areas and levels of cooperation.

Q19 - In which cooperation area would you be interested?
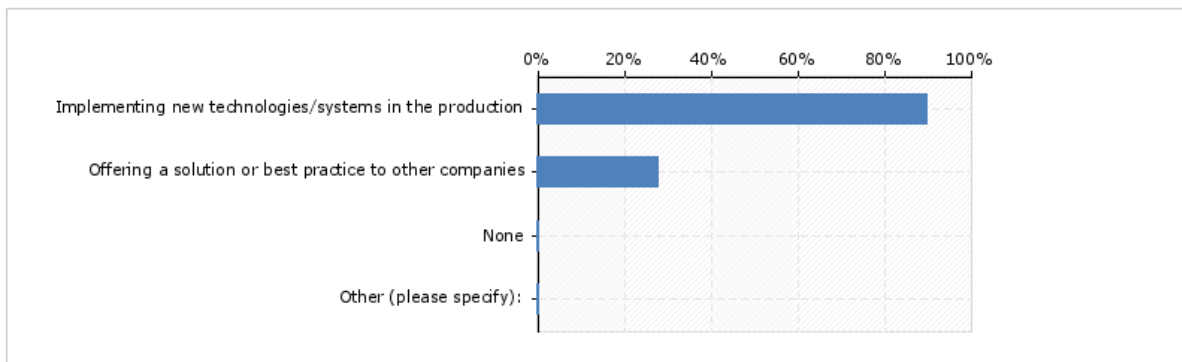
Q20 - At what level would you be interested in cooperation?
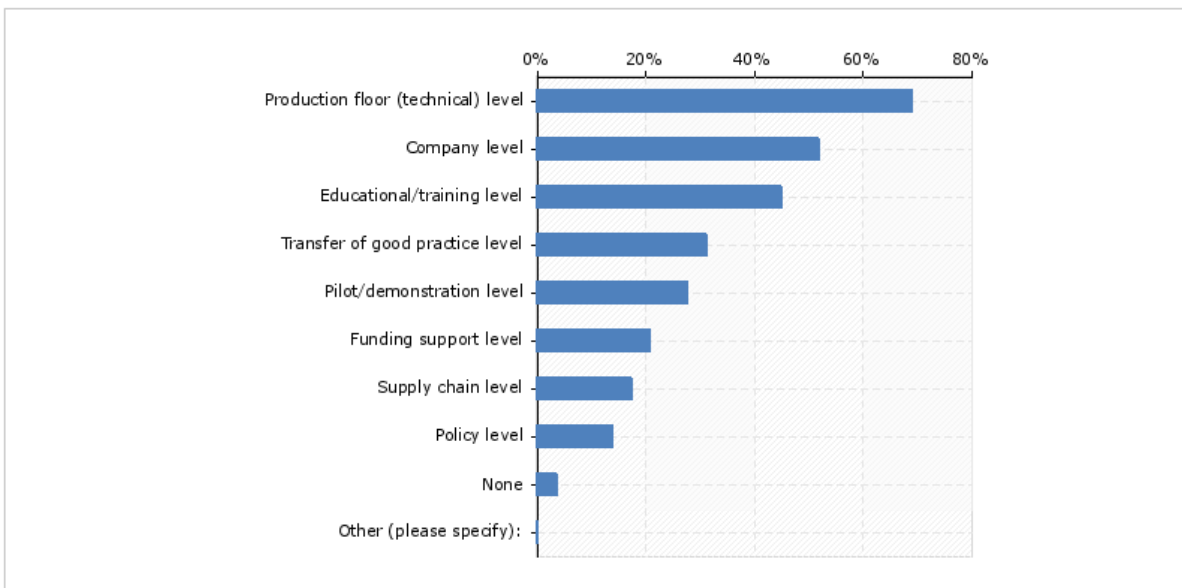
It is important to note that most of the organizations are production oriented companies who are willing to implement new technologies/systems in production (85%). Less than 24% answered that they would like to offer solutions or best practice to other companies.

KEY MESSAGE:
More than 85% of Romanians SMEs are willing to cooperate in the future, predominantly acting as companies that are receiving new technologies and systems. It is important to note that they are willing to fund and support concrete technical cooperation solutions and systems.

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3 Conclusion

In Romania, less than half of respondents to the questionnaire understand the benefits and impact that smart manufacturing can have on their company. The vast majority of companies participating in the study said they were not involved in setting intelligence specialization policy, only 20% stated that they were involved in this process. This is somewhat explicable by the fact that in Romania the intelligence specialization policy was established at the level of development regions through a complex process involving the participation of large companies, universities and research centres in the region as well as public authorities. The survey shows that 31% use Smart Manufacturing systems / solutions within their organization of the 42% who say they understand the benefits / impact of "Smart manufacturing" for their organization.

The main obstacle to implementing / adopting smart manufacturing solutions in Romania is their cost, followed by the lack of information (only 42% said they know what it means) and resistance to change from employees.

SMEs in Romania need smart manufacturing to lower production costs while increasing product quality and speeding up production without neglecting security that is also considered to be very important in the vision of SME participating in the studio.

The Romanian SMEs are planning to become more active in the future with smart supply networks, responsive manufacturing and robotics being the top three areas of interest. Lean Manufacturing is considered the most preferred manufacturing process optimization system and Employee motivation is the most selected HR management system that is currently being implemented and will be improved in the future. More than 80% of respondents are willing to cooperate in the future either through the implementation of new technologies / systems in production of which 70% are directly involved in the production process.

The respondents are also willing to cooperate on educational level or transfer of good practice to their companies, which shows their desire to be very concrete when it comes to following new trends in production and raising their competitiveness. Interestingly, attracting additional funds is barely on the 6th which is positioned after their desire to take part in pilot or demonstration projects.