

DOCUMENT TITLE:

CRITICAL FACTOR SME DIAGNOSIS REPORT FOR HUNGARY

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

Acronym: Smart Factory Hub

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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		

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1 Introduction

The table below points out the number of the companies who took part in the survey. As it can be seen 36 attendants have entered the introduction part, and 30 of them have entered the first page as well. As regards the responding part 28 companies have begun to reply, however not all of them, only 25 have finished the questionnaire. However, all of the 25 responders provide usable units to the survey. As far as the breakoffs are concerned, eight introductory breakoffs, whereas three questionnaire breakoffs happened during the filling.

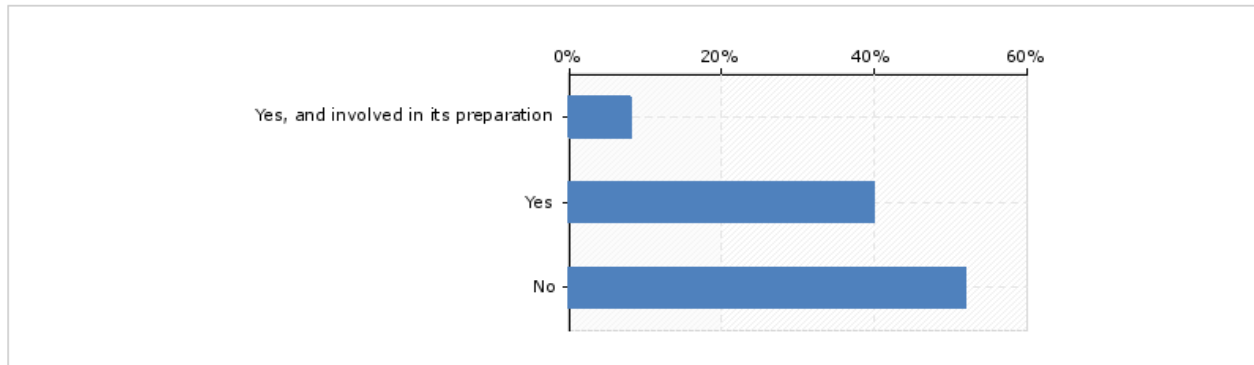
Response rate (?)		Base: <input type="text" value="Entered intro"/>
Status	Frequency	State
Entered intro	36	100%
Entered first page	30	83%
Started responding	28	78%
Partially completed	28	78%
Completed	25	69%
Unit usability (50%/80%)		
Usable units	25	100%
Partially usable units		0%
Unusable units		0%
Breakoffs		
Introductory breakoffs	8	22%
Questionnaire breakoffs	3	8% (neto 11%)
Total breakoffs	11	31%

2 Survey results for Hungary

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.



As the Q3 table above reflects, the majority of the asked SMEs are neither familiar with the national Smart Specialization strategy nor the policy initiatives regarding Smart Manufacturing. However, 40% of the attendants claimed that they are aware of the most significant Smart manufacturing policies, which can be considered a good starting-point. What is more, some SME-s have taken part the preparation progress of the relevant strategies, therefore they start with benefits in the market, comparing to other companies who are not familiar with the Smart Manufacturing policy initiatives at all.

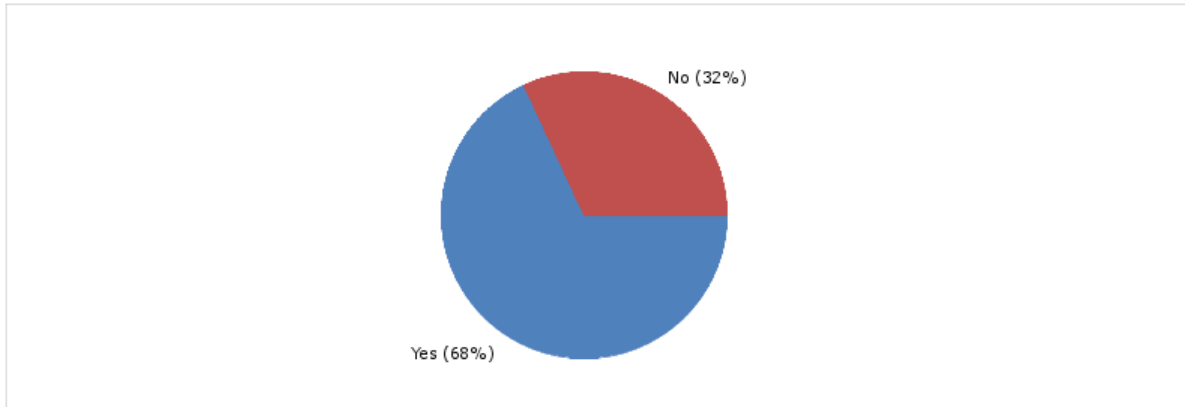
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The collected data show that unfortunately the majority of the asked SMEs are not familiar with the national Smart Specialization strategy and the relevant policy initiatives. The aim is that more and more SME-s be aware of these policies (RIS3 strategy, Industry 4.0 policy...) in order to keep abreast of the latest developments in the industry.

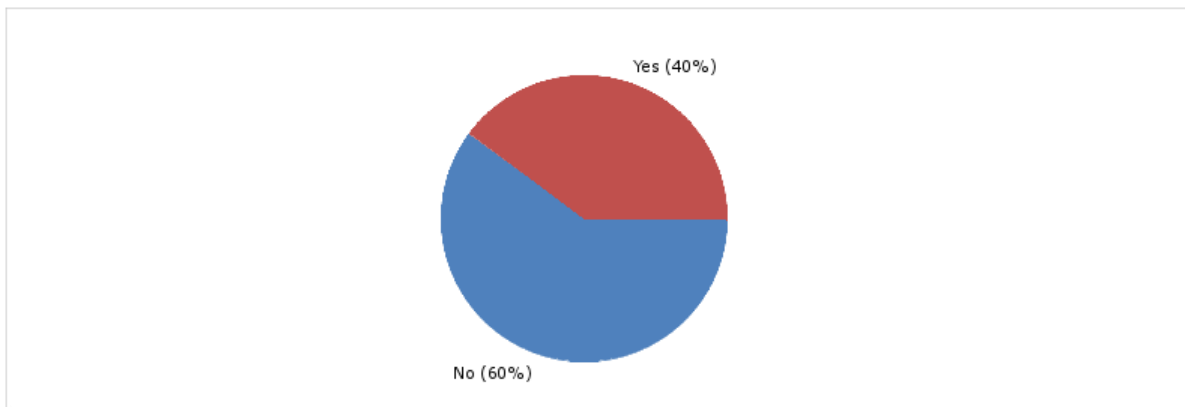
2.2 KEY QUESTION 2: How well is Smart Manufacturing perceived at strategic and spread at operational level (maturity of Smart Manufacturing in the SMEs)?

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 the benefits/impacts of "Smart manufacturing" for your organization are?



Q6 - Do you currently use Smart Manufacturing systems/solutions in your organisation?



As it can be seen in the Q6 figure, 60% of the organisations regularly do not use systems and/or solutions that can be connected to Smart Manufacturing. Nevertheless, in 40% of the participants Smart Manufacturing tools have already been implemented.

The Q4 diagram shows that the majority (68%) of the asked SMEs do comprehend the advantages of Smart manufacturing in their organization. This data is advantageous because the directorate of the companies are able to take advantage of the benefits provided by Smart Manufacturing.

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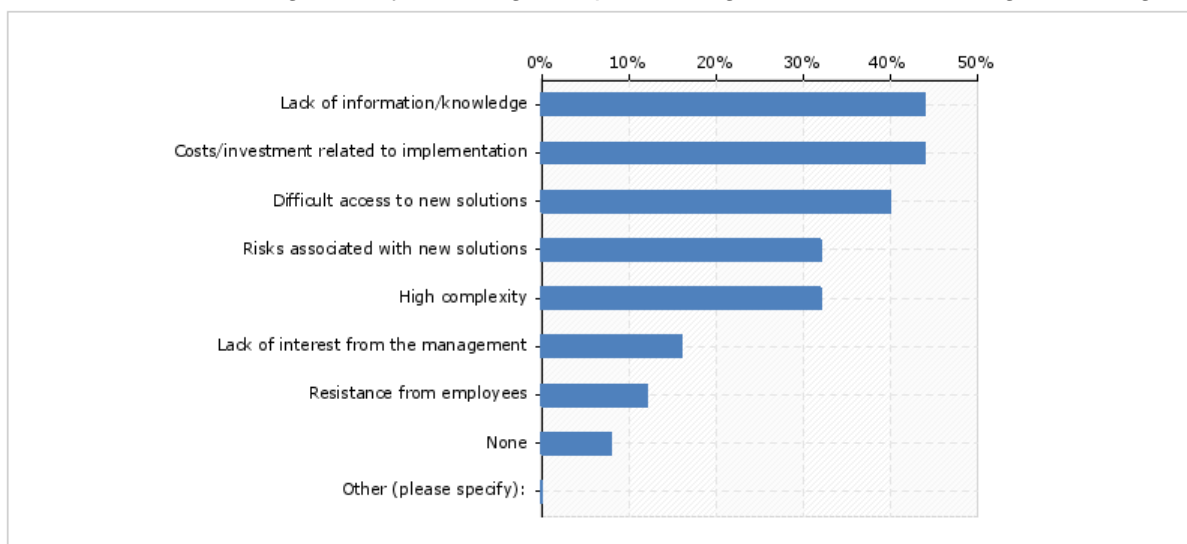
As the Q6 diagram points out, only 40% of the respondent SMEs use Smart Manufacturing devices in their organisation. The purpose is that organisations that do not use Smart Manufacturing tools familiarize with the benefits of this kind of Manufacturing. The Q4 diagram asked whether the management of the organization is aware of the advantages of Smart devices. The data shows that approximately 2/3 of the organizations understand the benefits/impacts of Smart Manufacturing, but nearly 1/3 do not. All in all,

the main objective is that as many organizations as possible use the Smart Manufacturing devices, and all of them understand how beneficial these are for them.

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?



The survey dealt with the question (in figure Q7) what the main challenges/obstacles are to implement Smart Manufacturing technologies. At this question seven specific challenges were listed, besides attendants could choose the answer “nothing” and they had the opportunity to specify other reasons that have not been mentioned in the list. As the results indicate, the most significant problems why Smart Manufacturing technologies cannot be implemented is the lack of information/knowledge (45%) and the expenditures related to the implementation (45%). These obstacles are succeeded by the difficult access to new solutions. Participants have marked the risks associated with new solutions and the high complexity in the same rate. (approximately 30%). Comparing to the already mentioned challenges, the management’s lack of interest (approx..18%) and the resistance of the employees (approx. 13%) are negligible factors.

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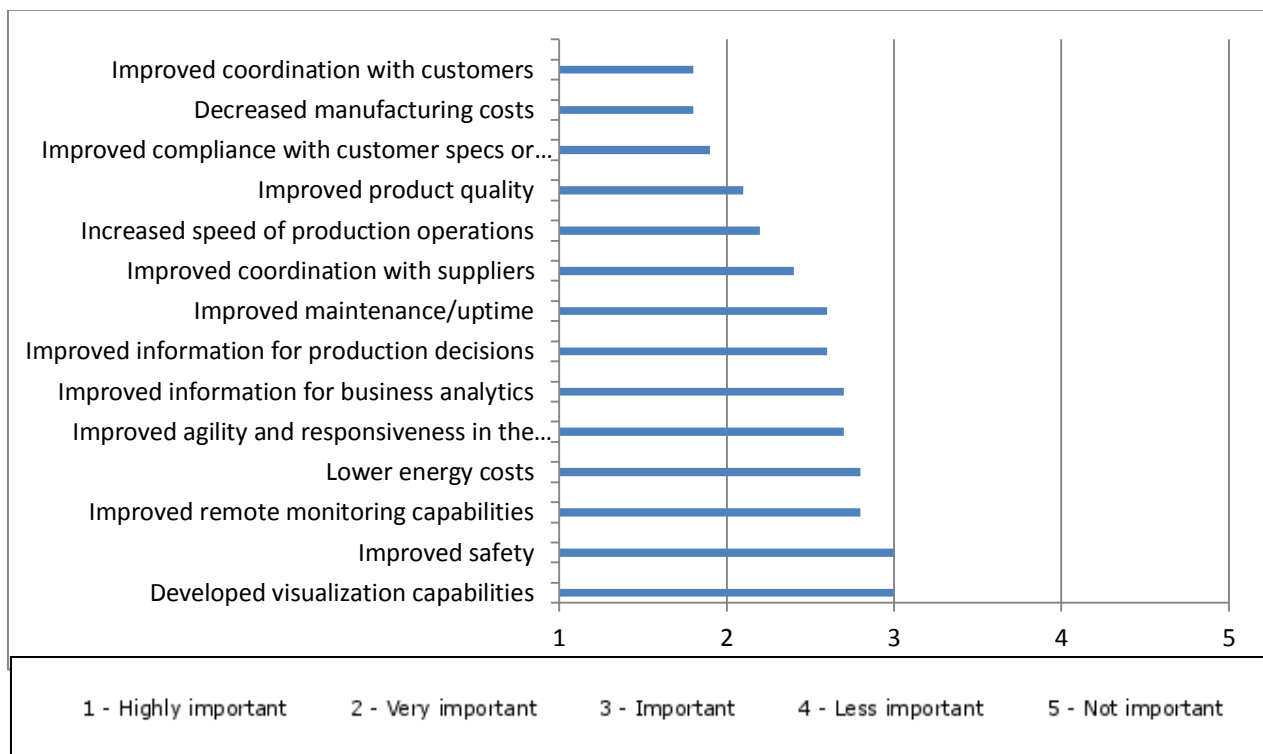
As the Q7 figure indicates, the participants’ main obstacles of the implementation of Smart Manufacturing devices are the lack of information/knowledge and the expenses

related to implementation. According to these data, on the one hand, organizations need to employ more qualified workers in order to they are able to apply Smart Manufacturing technologies. On the other hand, attendants have marked that they cannot afford devices related to Smart Technologies, so the lack of money plays an important role in the non-usage of these tools. Besides the above mentioned problems, the difficult access to new solutions is also a remarkable obstacle. This factor may be in correspond with the costs that Smart Manufacturing requires. The survey has pointed out that the lack of interest of the directorate and the opposition of the workers are not important challenges regarding Smart Manufacturing implementation.

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?



As it can be seen in the figure, the most substantial areas of making the companies competitive in the near future are the improved coordination with customers, the decrease of manufacturing costs, and the enhanced compliance with customer specialists. In total, these three areas have been marked as the highly important ones. Besides the already mentioned areas, the figure reflects that the best product quality, the growth of speed in production operations, and the improved coordination with the suppliers also play significant roles in the improvement of companies' competitiveness. Compared to the aforesaid areas, based on the participants' replies the improvement of maintenance, information for production decisions and for business analytics as well as development of agility and responsiveness in the production process are less important in correlation with competitiveness enhancement. As the figure points out, for the attendants, lower energy costs, the improved remote monitoring capabilities, safety and visualization development are the less relevant. Nonetheless, this data is relative because these areas all in all have been marked important in the five degree scale.

KEY MESSAGE:

The Q8 table lists several areas of improvement that would be fundamental to the companies' competitiveness in the near future. The attendants could indicate the areas with five opportunities from "highly important" to "not important". The figure unequivocally shows that in overall none of the 14 specified areas have been marked "less important" or "not important". In other words all of the factors have been considered important by companies. In the knowledge of these data, all factors have to be taken into consideration if we talk about enhancement of companies' competitiveness.

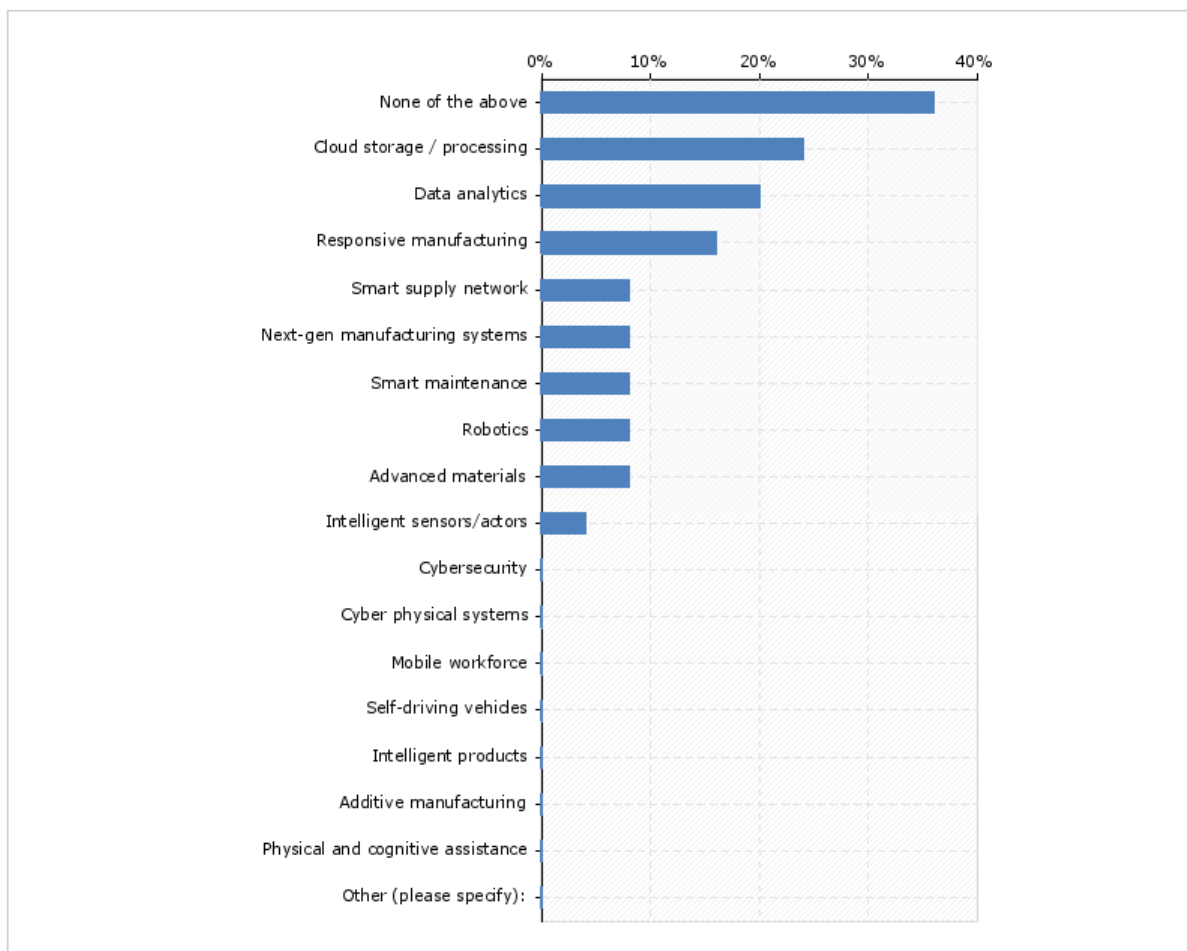
2.5 KEY QUESTION 5: What are the current state-of-art and future plans/strategic orientation for implementation of SMEs in relation to all three areas of intervention?

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.

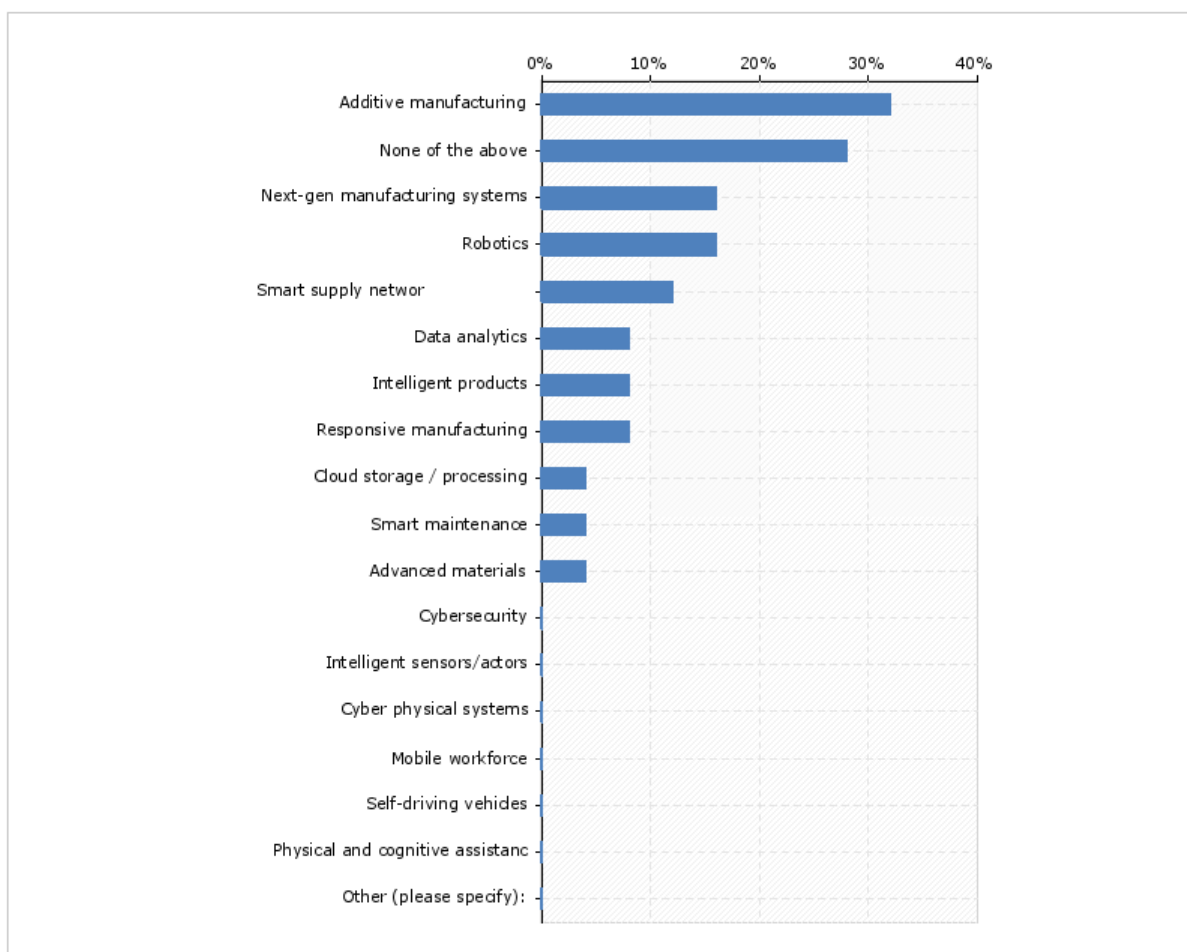
Q10 - What kinds of novel technologies are currently implemented in your company?



The Q10 figure shows that what kind of novel technologies are currently implemented in the companies. The table lists numerous devices, tools, among others from cloud storage and data analytics through smart supply network, and robotics up to intelligent products, additive manufacturing as well as physical and cognitive assistance. As the responses reflect, nearly 40% of the companies do not use any of the listed technologies. It is undeniable that this rate has to

increase in order to companies are able to keep abreast of the recent technological changes. The other side of the coin is that there are some modern devices that exist in companies. From the list, cloud storage is the most popular, approximately 25% of the companies is currently using this technology. This is followed by data analytics (20%) and responsive manufacturing (approx. 15%). According to the table, smart supply network, next-generation manufacturing system, smart maintenance, robotics and advanced materials stand in the same position (approx. 8%). Last but not least, intelligent sensors/actors are implemented in about 5% of the attendant companies.

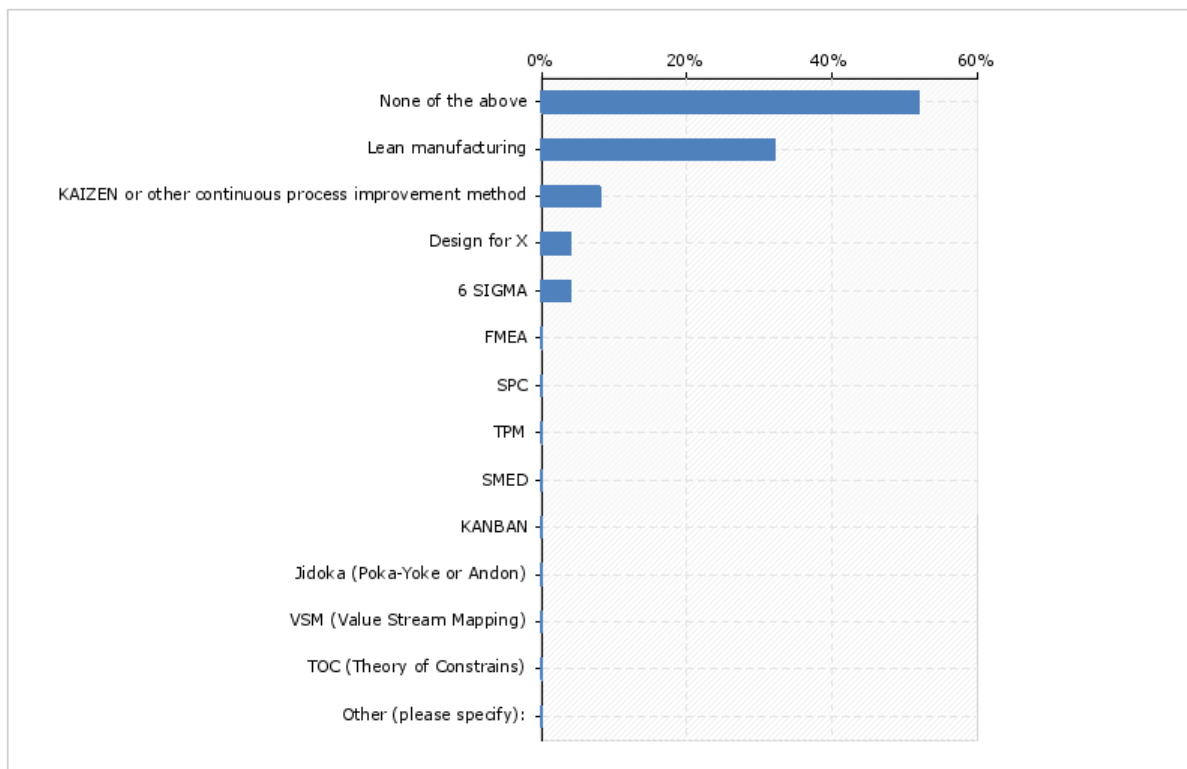
Q11 - What kinds of novel technologies are relevant and/or planned to be implemented in the future?



The Q 11 table figure refers to technologies that companies are contemplating to implement in the future. The list is the same as it in Q 10, only the rate differs. Generally speaking, additive manufacturing is the most popular technology that will be implemented soon, based on the participants' answers. Approximately every third company plans to implement this modern technology. However, almost 30% of the companies do not wish to carry out any of these recent technologies, which is a relatively big rate and ought to decrease. The collected data

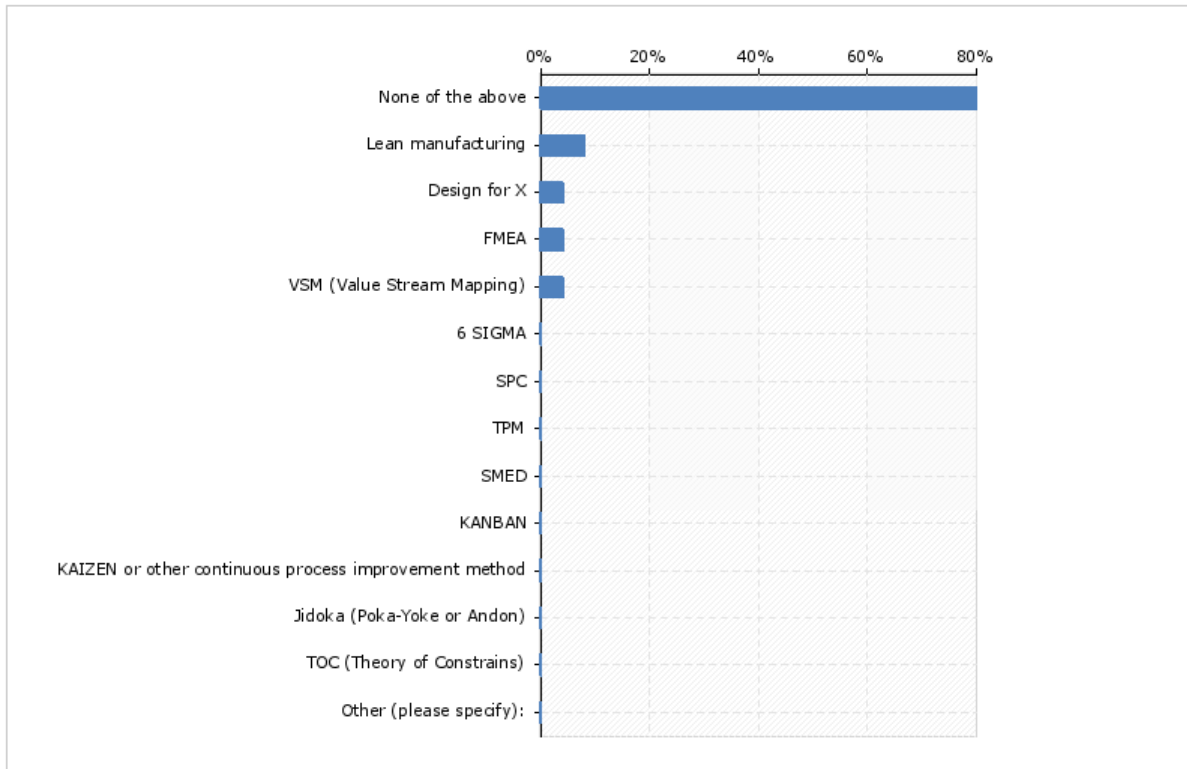
have shown that next generation manufacturing systems and robotics are planned to be implemented by 15% of the companies. These technologies are succeeded by smart supply network. (approx.: 12%). Furthermore, data analytics, intelligent products, responsive manufacturing are to be implemented by about 8% of the participant companies, whereas 5% want to implement cloud storage, smart maintenance, and advanced materials.

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



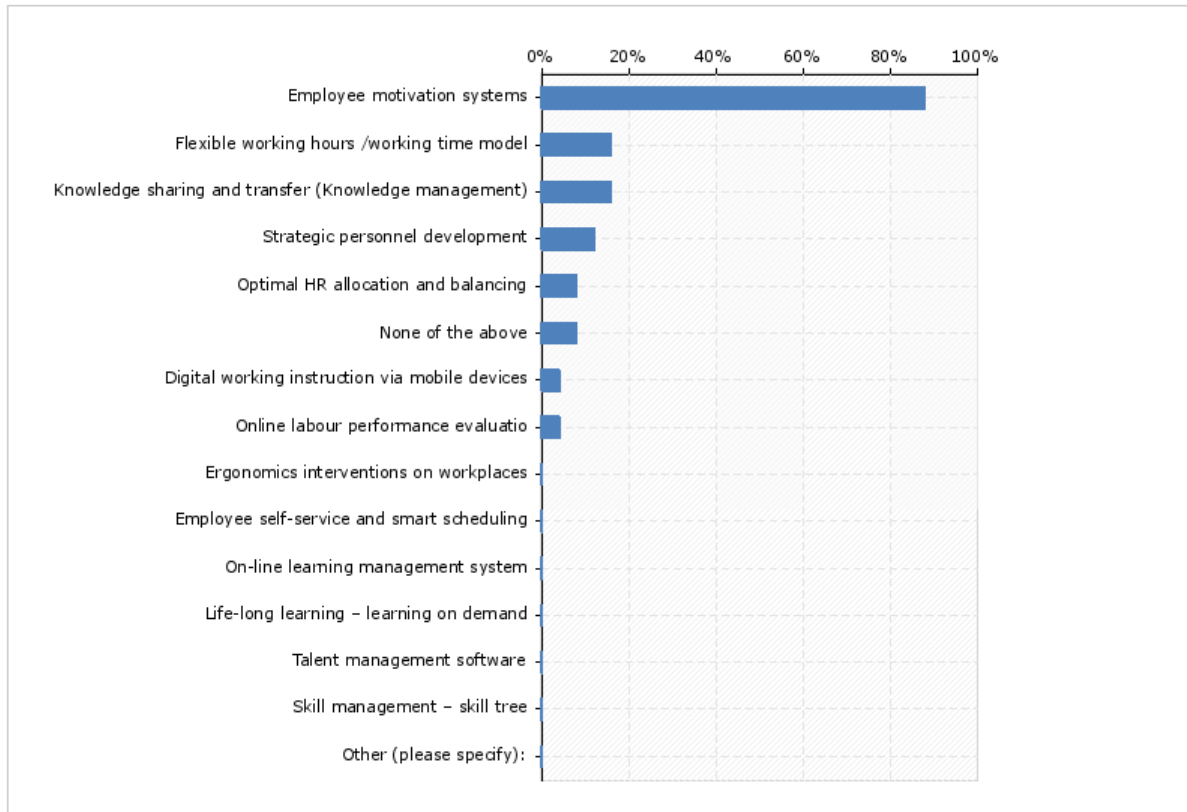
The Q13 question asks the currently implemented production processes, and the summary of the received data can be seen in the above figure. In spite of the fact that 12 various processes have been specified, almost 50% of the respondents do not implement any of them. From the specified list, lean manufacturing was the most popular that is used by 30% of the participants. Compared to this data, KAIZEN, Design for x, 6 Sigma are less relevant. The other production processes have not been chosen.

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



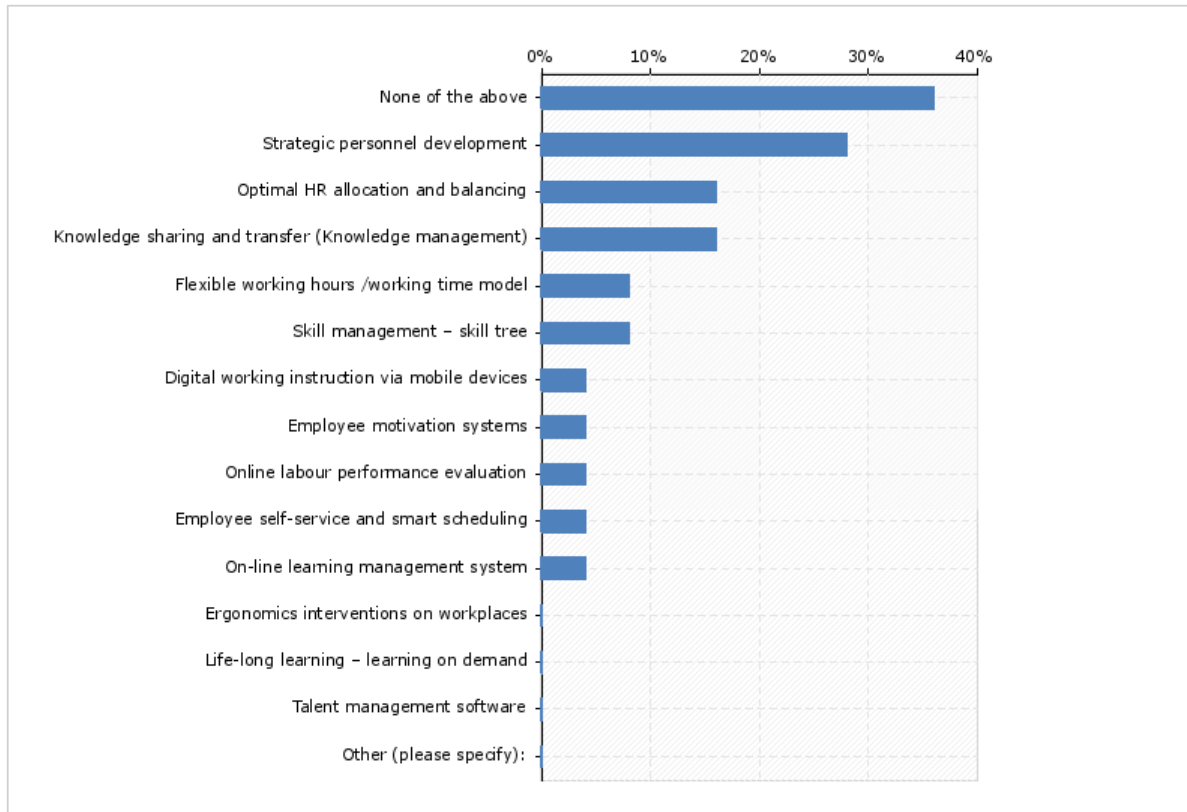
The Q14 question examined that from the Q13 list which production processes are planned to be implemented in the future. Regrettably, 80% of the companies do not intend to use any of the mentioned processes in the future. However, from the list, lean manufacturing, design for X, FMEA and Value Stream Mapping have been chosen to be implemented.

Q16 - What kinds of solutions/methods related to human resource management are currently implemented in your company?



The Q16 question has scrutinized solutions and methods related to human resource management that are currently implemented in the companies. 14 diverse solutions have been listed, and the replies doubtlessly show that employee motivation systems are the most significant methods in human resource management. (approx.:88%). Compared to motivation systems, flexible working hours and knowledge management have been only chosen approximately by 18% of the companies. Besides these, strategic personnel development, (approx.: 16%) optimal HR allocation, (approx.: 10%) digital working instruction (approx.:5%) as well as online labour performance evaluation (approx.:5%) have also been selected. It is important to mention that about 10% of the attendants has chosen that none of the mentioned solutions are present in their companies.

Q17 - What kinds of solutions/methods related to human resource management are planned to be implemented in the future?



The Q17 figure points out that what kind of solutions as well as methods related to human resource management are to be implemented in the future in the respondents companies. On the one hand, it can be seen in the table, that approximately 35% of the companies do not propose to implement any of the listed methods. On the other hand, numerous methods have been chosen by the companies though. The most popular would-be method is the strategic personnel development, that has been chosen by almost 30% of the participants. Additionally, optimal HR allocation and balancing as well as knowledge management also play important roles, because 15% of the companies have marked these methods as plans for the future. Furthermore, flexible working hours and skill management are also have to be mentioned, both of them are promoted by about 8% of the companies. In overall, merely 5% of the participants have marked digital working instruction, employee motivation system, online labour performance evaluation, employee self-service and online learning.

KEY MESSAGE:

If the data from the Q10-Q17 table are summarized it can be easily seen that enormous changes and development are needed in the participant companies if they would like to keep up with the latest technologies and other devices. As the Q10 table figures approximately 40% of the companies do not implement any of the listed novel

technologies. The most popular modern technological devices are cloud storage (25%) and data analytics (20%).

As far as the would-be technological plans are concerned, the introduction of additive manufacturing has been marked the most significant device. (approx. 33%) However, nearly 30% of the companies do not wish to implement any of the listed recent technologies, which is a relatively high rate.

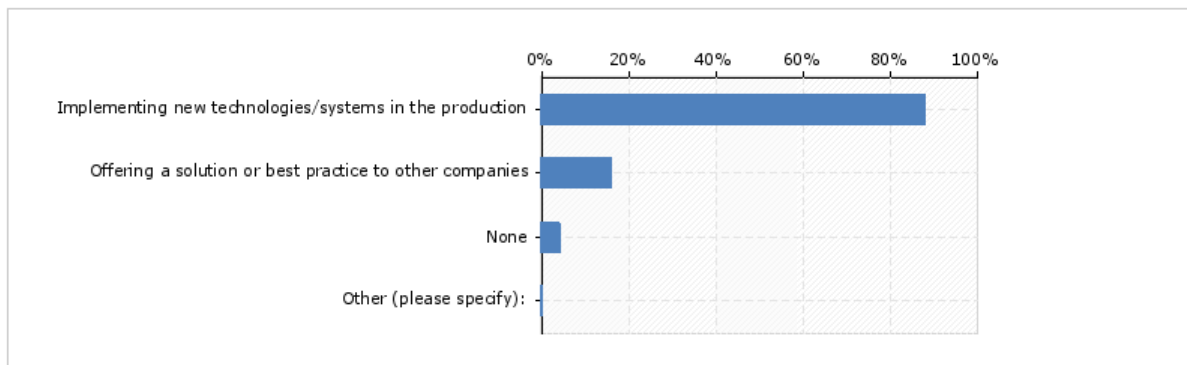
As regards the production processes, merely four systems have been selected out of the 12, because the majority of the companies do not use any of them. As the Q14 table indicates the majority of the companies do not wish to change in their production processes either, and merely four production processes have been selected from the list for future use.

The Q16 figure reflects that employee motivation systems are the most remarkable solutions in connection with current human resource management. As regards the future plans, strategic personnel development are the most desired method in human resource management. Nonetheless, approximately 35% of the respondents do not wish to implement any of the offered solutions.

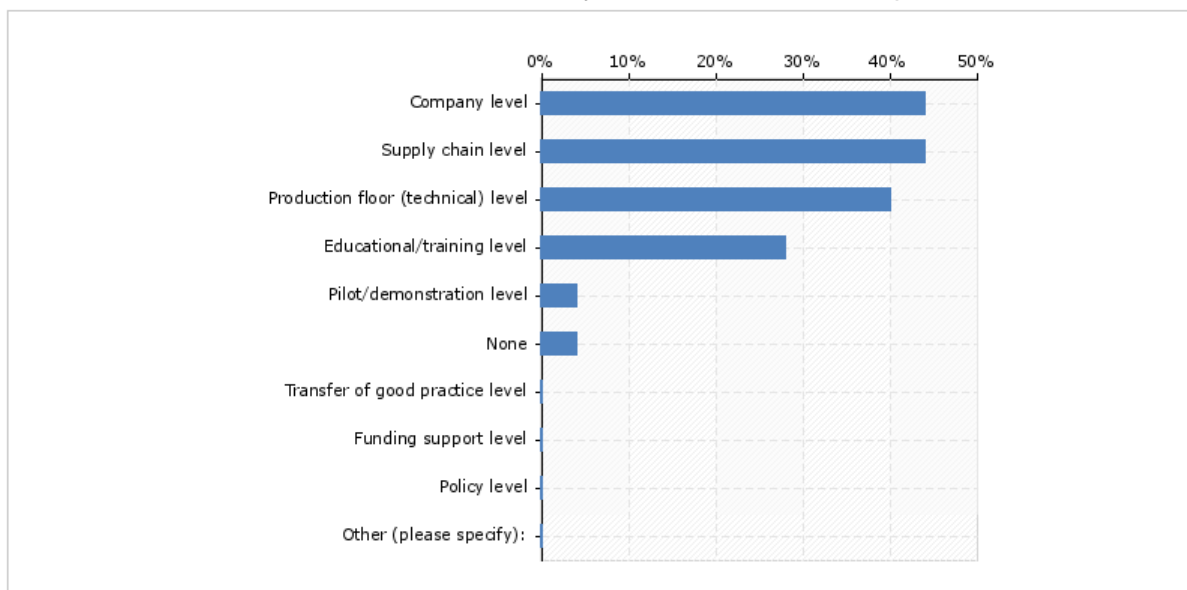
2.6 KEY QUESTION 6: Would SMEs be willing to cooperate, in which areas and at what levels?

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?



The Q19 and Q20 questions analysed the cooperation of the companies. The Q19 figure asks the area that would be interesting among respondent companies. As the figure points out the majority of the participants (approx.:90%) have selected cooperation area through which they are able to implement new technologies in the production. As far as the level of the cooperation is concerned, about 45% of the companies are interested in collaboration at company level and supply chain level. Besides these, technician level, and training level have to be mentioned too, which have been selected by 40% and 30% of the participants.

KEY MESSAGE:

The 6th key question has dealt with cooperation between companies. The figures show that the majority of the respondent companies are open to collaborate with other institutions. The Q19 diagram reflects that the most popular area in cooperation is the implementation of new technologies and systems in production.

As regards the level of the cooperation, as it can be read from the data the most company would like to cooperate at company level and supply chain level. All in all, very few companies are not interested in any form of cooperation.

3 Conclusion

Taking everything into consideration, according to the received data, it can be stated that currently, in the respondents companies smart manufacturing and novel technologies are not widely implemented yet.

As the survey reflects, the majority of the asked SMEs are neither familiar with the national Smart Specialization strategy nor the policy initiatives regarding Smart Manufacturing. In consequence, in 60% of the attendant companies Smart Manufacturing is not present yet. Lack of knowledge and information as well as the expenses related to implementation have been marked by companies as main obstacles to initiate Smart Manufacturing.

The results which can be seen in the Q8 figure are very interesting, because all of the listed areas have been selected at least “important” in the fifth degree scale regarding improvement of companies’ competitiveness. Within the different areas the improved coordination with customers and the decreased manufacturing costs have been selected the most remarkable ones.

As far as the already implemented novel technologies are concerned, the answers indicate that in the most companies none of the listed technologies are used currently. Nevertheless, cloud storage and data analytics are used in 25% and 20% of the companies. As regards the planned novel technologies, additive manufacturing has been widely chosen, approximately one-third of the respondents wish to implement this method in the near future.

The Q13 question that has dealt with production processes has shed light on that about the half of the companies do not use any of the listed processes currently. Whilst, the most popular process was lean manufacturing that has been chosen approximately by one-third of the companies. The related question that asked the companies about their future plans regarding production processes points out that none of the mentioned processes are to be implemented by the majority (80%) of the companies.

Additionally, the survey has demonstrated that in connection with human resource management currently the employee motivation systems play the most significant roles (approx. 88%) in companies. However, nearly 35% of the companies do not intend to implement further solutions in this area.

Last but not least, the majority of the respondent companies are interested in cooperation with other organizations, and the main priority is the implementation of new technologies in the production. As regards the level of the cooperation, company level and supply chain level have been selected by the most companies.

All in all, on the one hand it can be claimed that the awareness of Smart Manufacturing and novel technologies ought to be increased in the companies. However, it was a positive result that additive manufacturing has been chosen by almost one-third of the companies to be implemented in the near future. On the other hand, production processes and the different solutions regarding human resource management should be popularized as well.