DOCUMENT TITLE:

CRITICAL FACTOR
SME DIAGNOSIS REPORT
FOR SERBIA

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
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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?

<u>Yes</u> / 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	*29*	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 Serbia has been conducted during the month of May 2017. Mainly we have been targeting smaller production oriented SME's from whole Serbia. Survey was realized through the Chamber of Commerce and Industry of Serbia's network by sending out circular e-mail and manually inserting collected answers to 1KA.

Around 200 SMEs were contacted and we obtained 29 usable, fully completed questionnaires, which brings us to 14,50% success rate.

Below we are providing the analysis of the results based on the key questions set out in the questionnaire development.

2 Survey results for Serbia

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.

Q1 - 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.
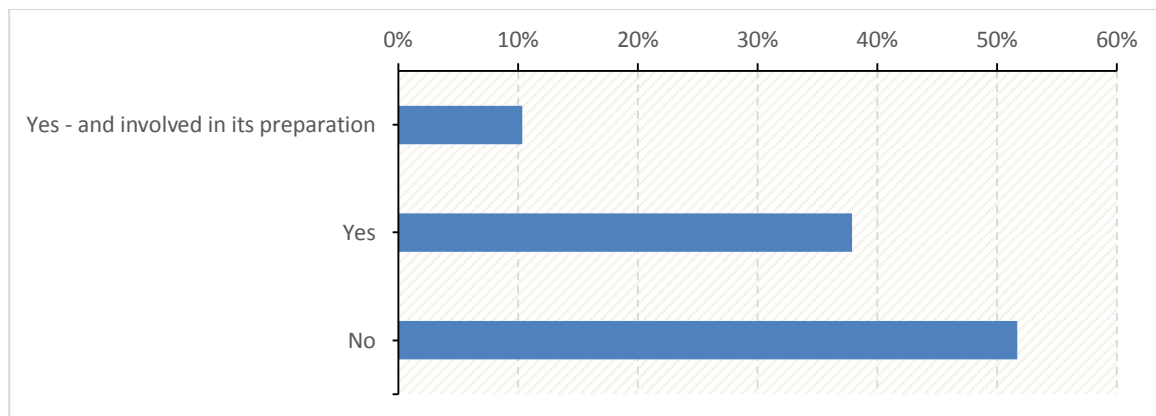
Taking into account that work on Serbian Smart Specialization strategy is ongoing in the framework of assigned Working Group, and that in fact strategy still doesn't exist, surprisingly high percentage of SME's (48%) responded that they are familiar with it and that they were involved in its preparation. One of the explanations could be their involvement in international projects like "Smart Factory Hub" where they have been in touch with smart manufacturing concept. On the other side, the majority of companies (52%) are not familiar with the Smart Specialization strategy.


KEY MESSAGE:
SMEs have mainly not been involved in development of the Smart Specialization strategy, while the concept of Strategy is more or less well recognized by the SMEs.


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 organization. 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 organizations.

Q2 - Do you understand what are benefits/impacts of ''Smart manufacturing'' for your organization?
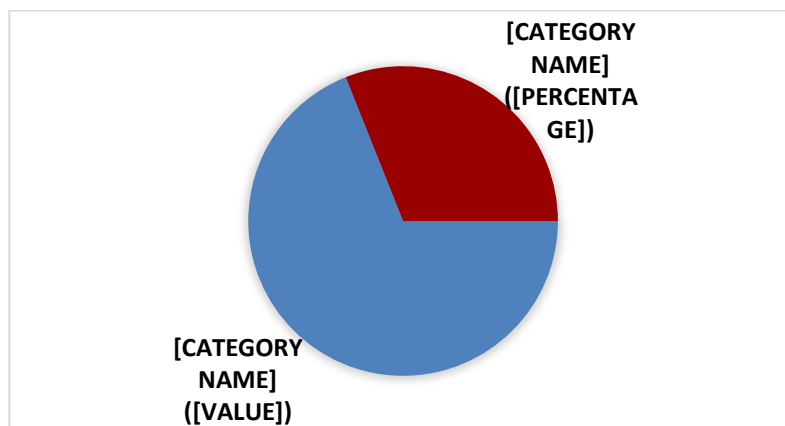
Q3 -   Do you currently use Smart Manufacturing systems/solutions in your organization?
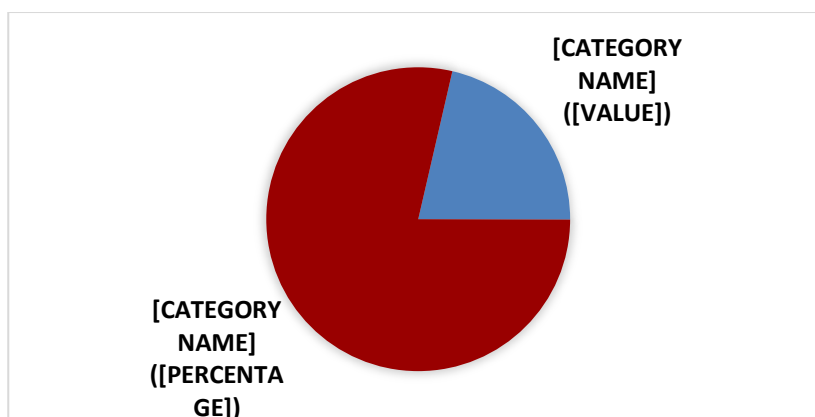
Based on answers to the question 2 we are able to conclude that 69% of companies understand the benefits of Smart manufacturing for their organization, while 31% have difficulties understanding the benefits brought by the Smart manufacturing systems/solutions. On the other hand, only 21% of SMEs currently use the Smart manufacturing systems/solutions in their organization.

> **KEY MESSAGE:**
> **From the technical view (systems and solutions) the Smart manufacturing is well perceived among Serbian SMEs, but only 21% of them using Smart manufacturing systems/solutions at the operational level.**

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.

Q4 - What challenges are you facing in implementing Smart Manufacturing technologies?
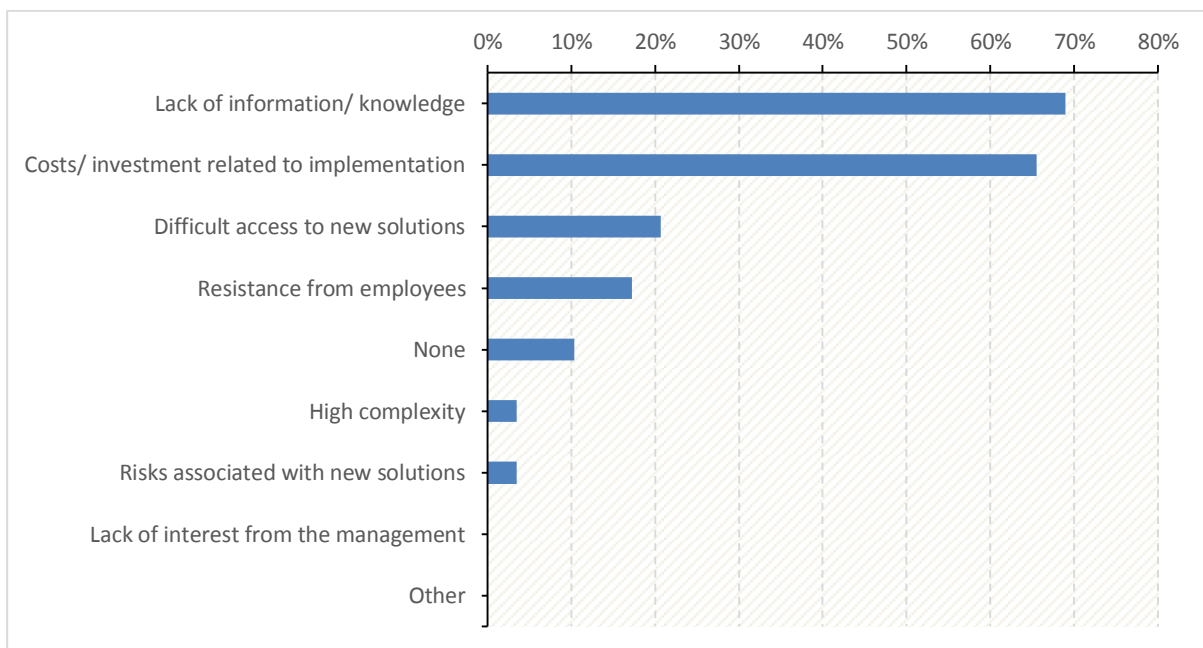
The most organizations (69%) believe that the biggest challenge for implementing Smart manufacturing technologies and solutions is in the lack of information/knowledge, which is followed by the costs/investments related to implementation (66%). After that, but only with 21% comes difficulties to access new solutions, followed by resistance from employees with 17%. High complexity and risks associated with new solutions with 3% both are very low. It is interesting to see that there is absolutely no lack of interest at the management level.


KEY MESSAGE:
SMEs are facing variety of challenges when it comes to the implementation of Smart manufacturing technologies, but the most important two are related to lack of information/ knowledge and investments.

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.

<u>Q5 - 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?</u>
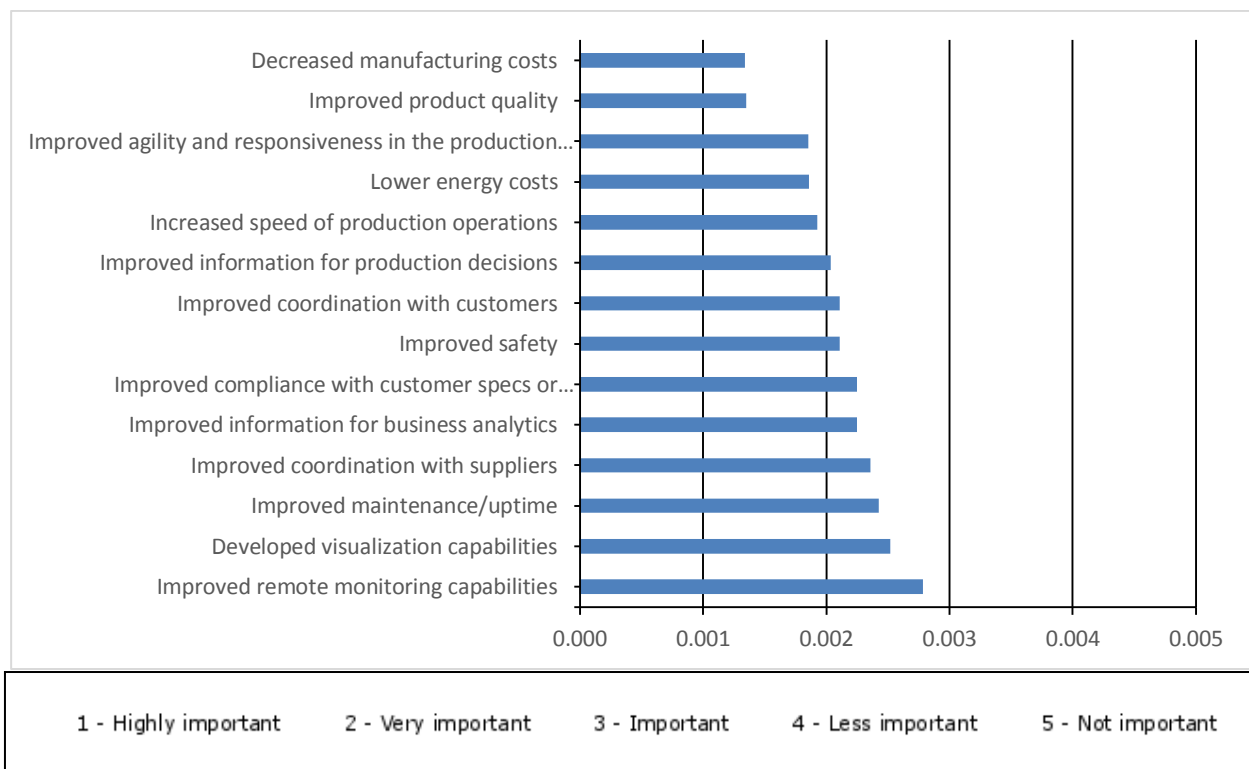
From all the answers received, we are able outline that SMEs pointed out few areas which will be of a special importance to them in the years to come. The most important areas are decreased manufacturing costs and improved product quality, which are followed by improved agility and responsiveness in the production process, lower energy costs and increased speed of production operations. These results show that the most important focus for SME's competitiveness will be: product quality, production costs and speed, energy, safety, customers, while areas like

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suppliers, maintenance, regulatory requirements, and business analytics are of less importance. Areas like visualization and monitoring are least important.

KEY MESSAGE:
The most influential areas for increasing SME's competitiveness in the future are (i) manufacturing costs, (ii) product quality, (iii) agility and responsiveness in the production process and (iv) energy costs.


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.

Q6 - What kinds of novel technologies are currently implemented in your company?
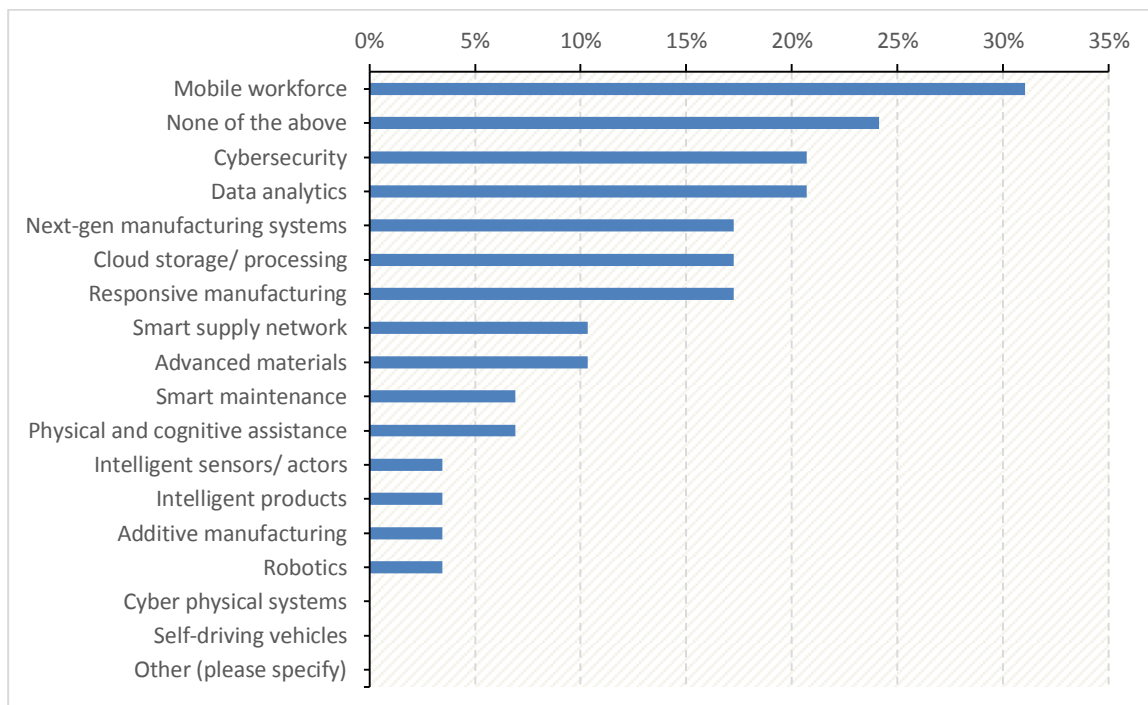
As seen above, 31% of SMEs are currently using mobile workforce, but 24% are not using any smart manufacturing systems/solutions in their production. Cyber security and data analytics are

following with 21% both, and after them the group of 17%: next-gen manufacturing systems, cloud storage/ processing and responsive manufacturing, while others are used less. It is interesting to see however that none of the SMEs replied with cyber physical systems and self-driving vehicles.

Q7 - What kinds of novel technologies are relevant and/or planned to be implemented in the future?
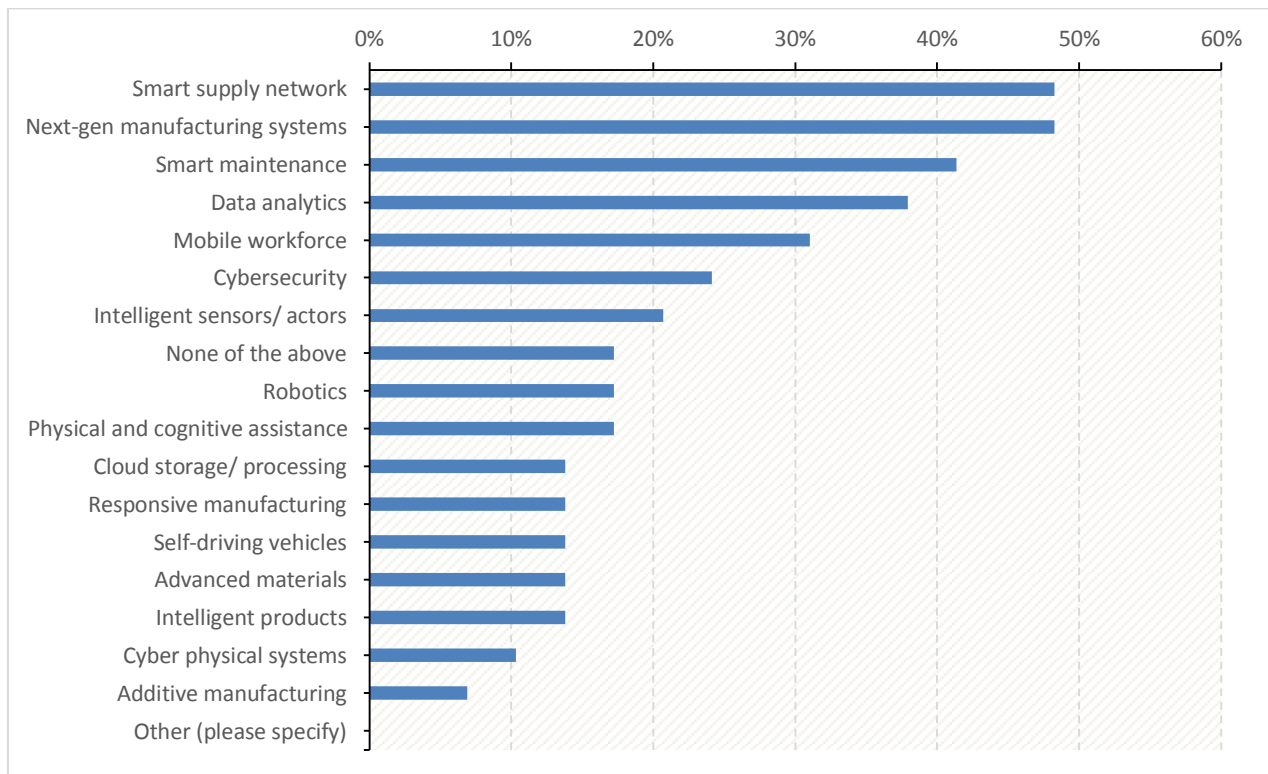

93% of organizations answered that they are willing to implement at least some new technologies in the future. The most organizations (48%) are planning to implement technologies related to smart supply network and next-gen manufacturing systems, which is followed by smart maintenance (41%) and data analytics (38%). Those three areas are in the upfront of all the answers from the organizations and should be the main orientation for the mapping possibilities in the future.

Q8 - What kinds of solutions/methods related to production processes are currently implemented in your company?
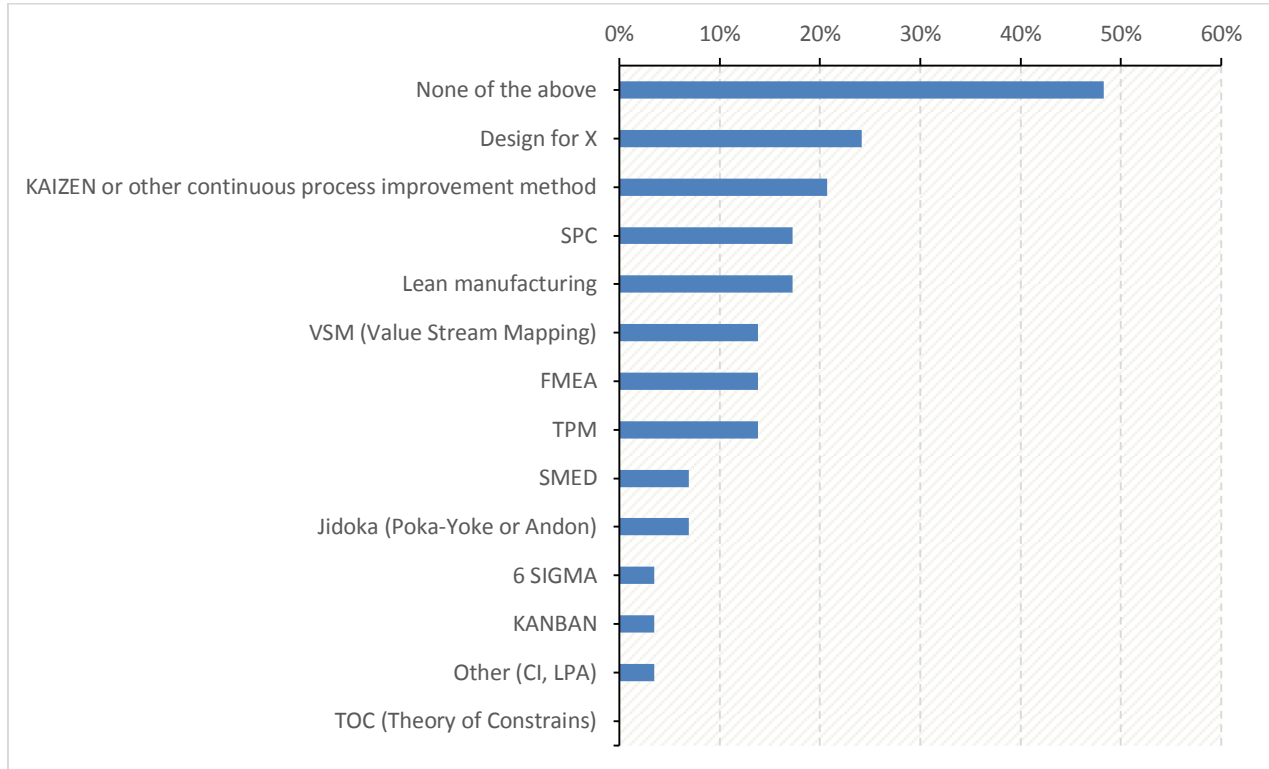

Solutions/methods related to the production process are currently not implemented in 48% of organizations. The ones who have implemented new methods choose the design for excellence (24%), KAIZEN (21%), SPC and Lean manufacturing both with 17%, while others were chosen by less than 15% of organizations.

Q9 - What kinds of solutions/methods related to production processes are planned to be implemented in the future?
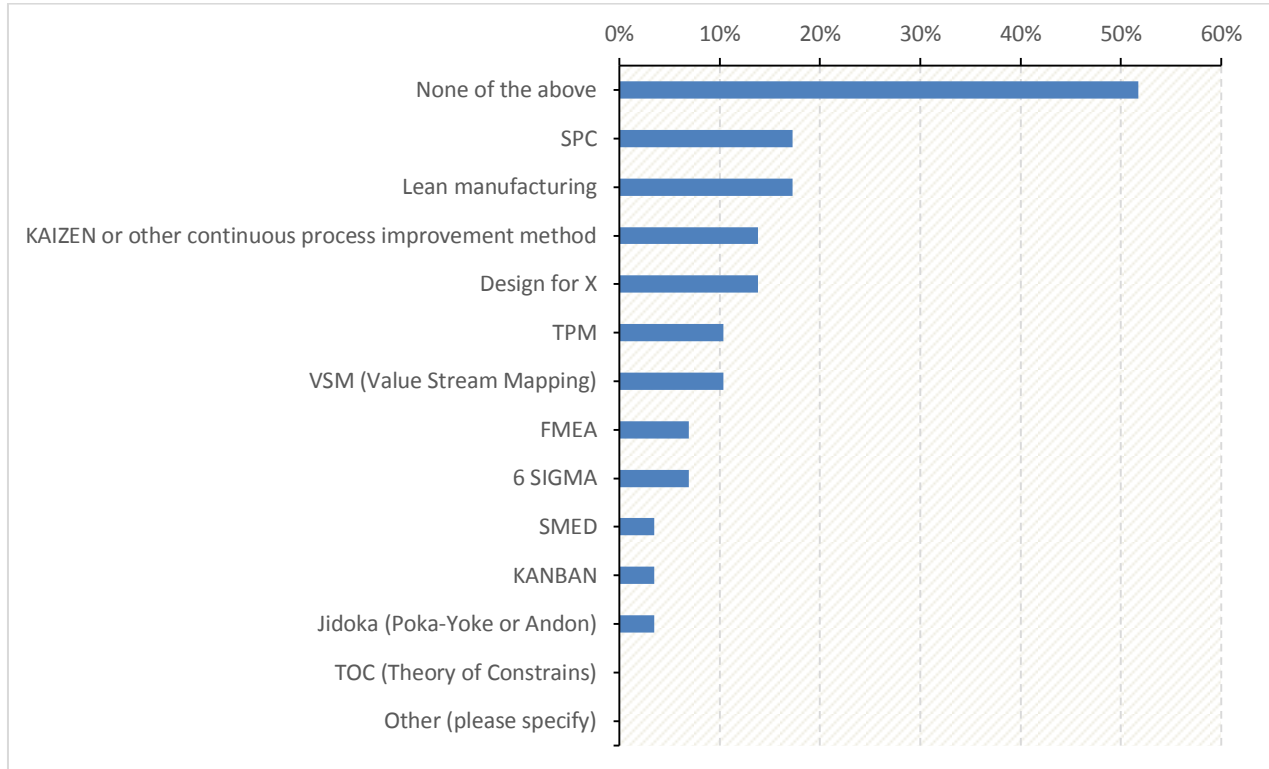

In the future, majority of SMEs (52%) do not have plans to implement new solutions/ methods for the production process. The ones, who will implement new methods, have chosen the answer SPC and Lean manufacturing both with 17%, and the others were chosen by less than 15% of organizations.

Q10 - What kinds of solutions/methods related to human resource management are currently implemented in your company?
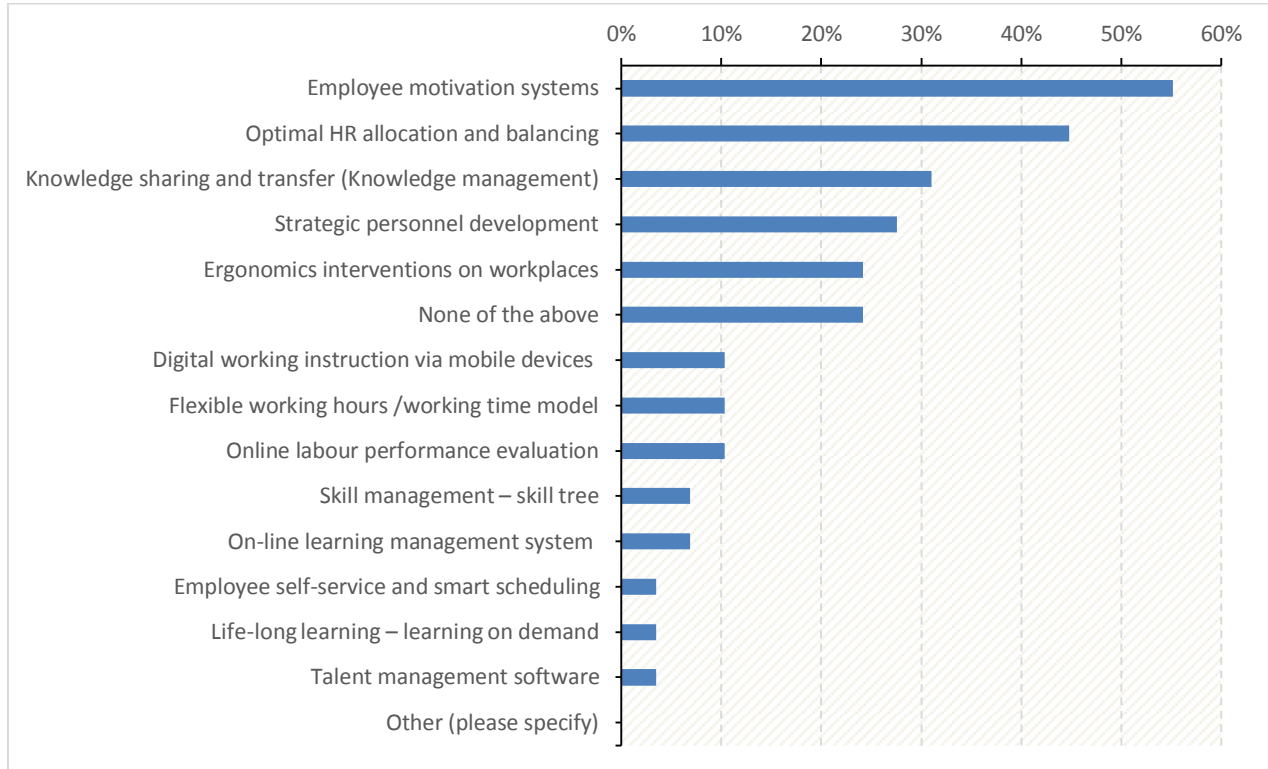
Unlike production processes, human resource management is implemented in more than 75% of surveyed SMEs. The most used is employee motivation system (55%), followed by optimal HR allocation and balancing (45%), knowledge sharing and transfer (31%), strategic personnel development (28%) and ergonomics interventions on workplaces (24%). There are still 24% of SMEs who do not use any of the solutions/methods related to the human resource management.

Q11 - What kinds of solutions/methods related to human resource management are planned to be implemented in the future?
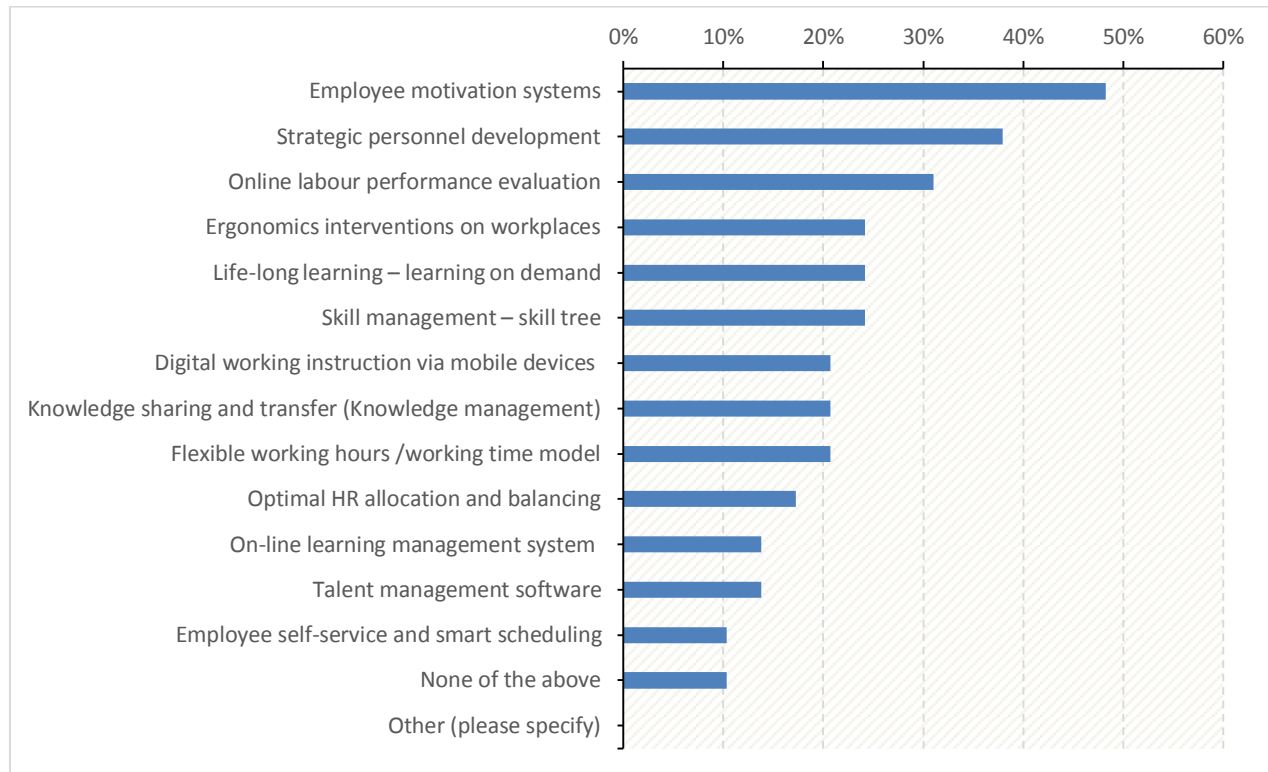
Focused on human resources, in the future, SMEs will be mostly looking to implement employee motivation systems (48%), strategic personnel development (38%) along with online labour performance evaluation (31). Other options were chosen by less than 25% of organizations. It is interesting that only 10% of SMEs have no plans for solutions/methods related to human resource management in the future, which could be due to the fact that they have already implemented them.


KEY MESSAGE:
Around 30% of Serbian SMEs are currently using mobile workforce in the framework of novel technologies with intention to implement smart supply network and next-gen manufacturing systems in the future. Almost 50% of SMEs are not implementing any solutions/methods related to production processes and more of 50% of them are not interested for their future implementation. Next areas of interest are statistical process control and lean production. In the field of human resource management, employee motivation systems is the method most used and also in the plans for 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 favorable areas and levels of cooperation.

Q12 - In which cooperation area would you be interested?
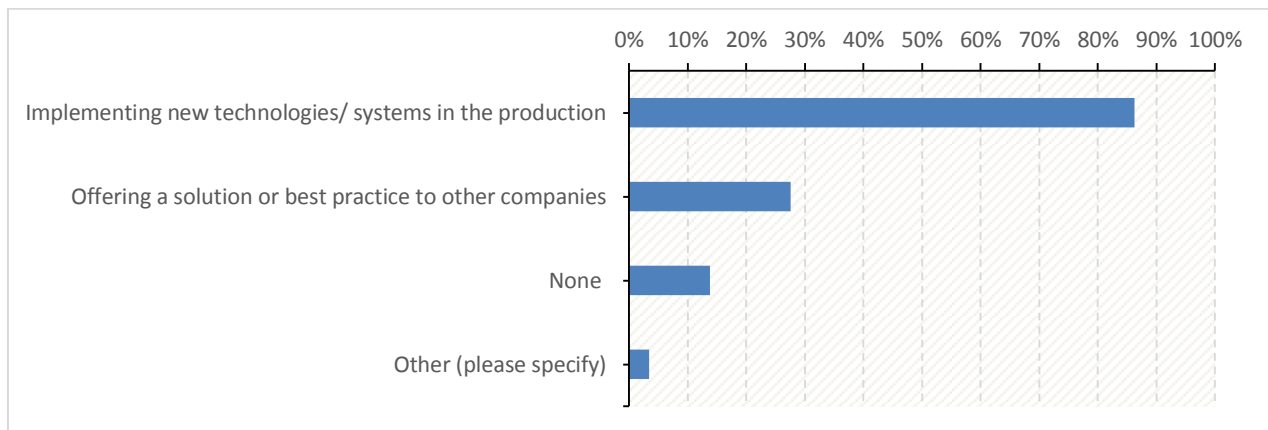
The most of the SMEs are production oriented companies who are willing to implement new technologies/systems in the production (86%), while only 14% answered that they are not interested in such cooperation. Less than 30% answered that they would like to become the solution provider or best practice showcase to other companies.

Q13 - At what level would you be interested in cooperation?
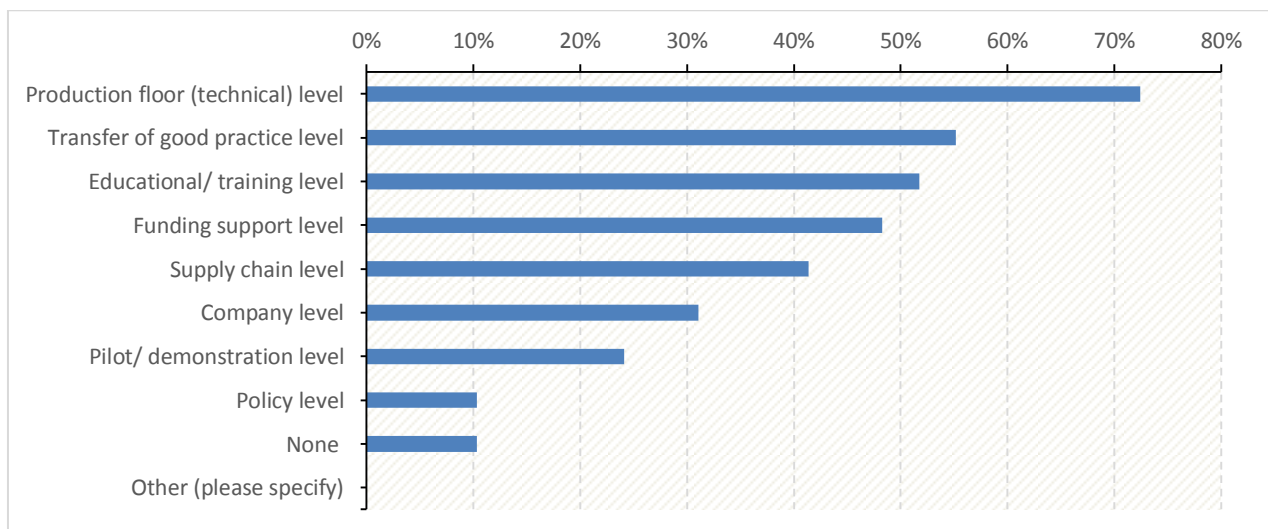
The other possible level of cooperation was proposed to SMEs, who responded more positively, with 10% of them answering negatively. It is very evident that majority of SMEs would appreciate cooperation on production floor (technical) level (72%), after which is cooperation on transfer of good practice level (55%) and educational/ training level (52%). Surprisingly, cooperation on funding support level comes on fourth place with 48%.

KEY MESSAGE:
Almost 90% of Serbian SMEs are willing to cooperate in the future, predominantly acting as "receivers" of new technologies and systems. They are mostly interested in the concrete technical cooperation at the production floor and the transfer of good practice.

3 Conclusion

As the work on development of the Smart Specialization strategy in Serbia is in progress, and the majority of companies are not involved in its preparation, more than 50% are aware of it and are involved. They find Smart manufacturing (in general) beneficial for their company and what matters even more, they are familiar with new trends in the industry and are starting to use the smart manufacturing solutions, technologies and methods. Almost 70% already understand the benefits of this, while only 21% of SMEs are already implementing technologies, solutions or methods related to smart manufacturing.

There are still difficulties related to the implementation, since many consider lack of information and knowledge, and costs related to implementation challenging, while others have troubles with access to new solutions. Serbian SMEs are very interested in introduction of new technologies and think that the most important fields for their competitiveness are decreased manufacturing costs and improved product quality.

Current state-of-art shows that around 30% of SMEs are implementing mobile workforce as novel technologies related to smart manufacturing, but almost 25% of them are not using any. There are still difficulties related to the production processes considering that almost 50% do not use any solution/method related to, and they do not intend to. Regarding the human resource management, employee motivation is in the focus of Serbian SMEs. A good thing is that they have intention to implement different technologies, solutions or methods in the future, especially in the field of human resource management.

At the end we can say that Serbia has a solid ground when it comes to current or future implementation of smart manufacturing technologies or solutions. Almost 90% of respondents are willing to cooperate in the future either through implementation of new technologies/systems in the production or by offering solutions or best practice to other companies. The most respondents are interested in cooperation on production floor level and transfer of good practice to their companies, which shows their intention to reduce the technological gap with companies in the region and that they are very concrete when it comes to following new trends in production and raise of their competitiveness.