

DOCUMENT TITLE:

CRITICAL FACTOR SME DIAGNOSIS REPORT FOR BULGARIA

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?

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 Survey has been conducted in Bulgaria from 16th of March until 20 June 2017. We have been targeting productions oriented SMEs. 200 SME representatives entered the survey and we managed to receive 25 completed questionnaires, which means that success rate was 13 %.

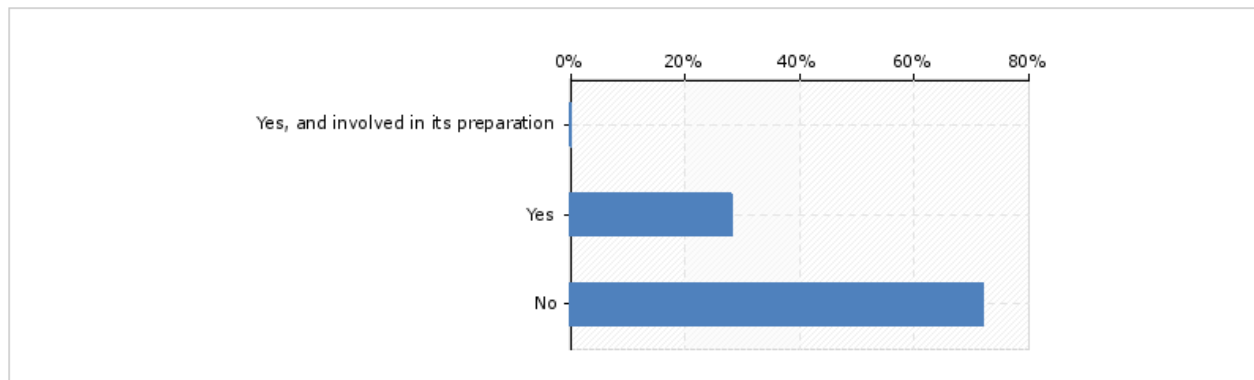
Response rate (?)		Base: Entered intro
Status	Frequency	State
Entered intro	200	100%
Entered first page	105	53%
Started responding	38	19%
Partially completed	38	19%
Completed	25	13%
Unit usability (50%/80%)		
Usable units	25	100%
Partially usable units		0%
Unusable units		0%
Breakoffs		
Introductory breakoffs	162	81%
Questionnaire breakoffs	13	7% (neto 34%)
Total breakoffs	175	88%

2 Survey results for Bulgaria

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.



The results show that 70% of companies, participated in the Survey are not familiar with the Smart Specialization Strategy. 30% of companies are familiar with the strategy, but none of them has been involved in its preparation.

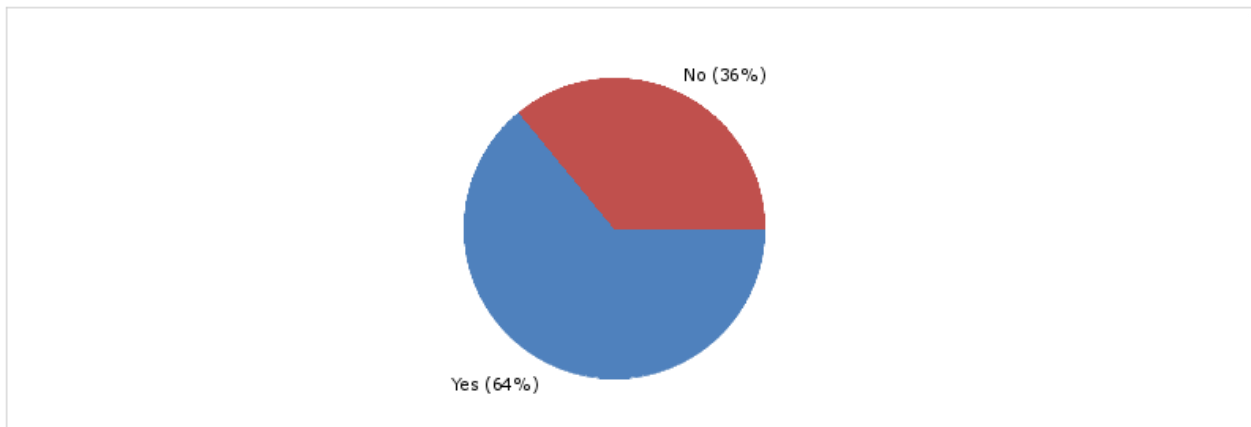
KEY MESSAGE:

Bulgarian SMEs have not been involved in development of the Smart Specialization Strategy, and the Strategy is not well recognised by the SMEs.

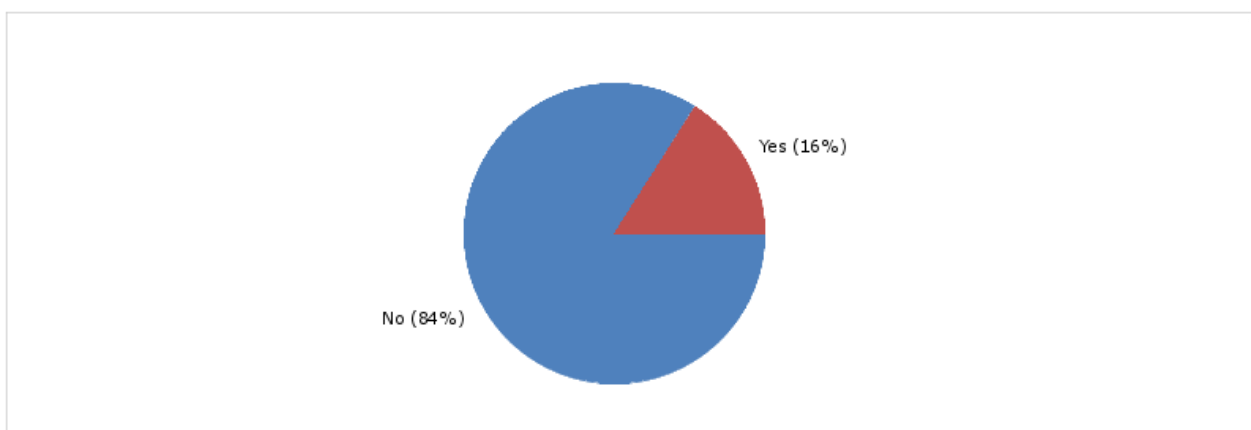
2.2 KEY QUESTION 2: How well is Smart Manufacturing perceived at strategic and spread at operational level (maturity of Smart Manufacturing in the SMEs)?

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 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?



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



Based on answers to the question 4 we are able to conclude that 64% of SMEs understand the impact of Smart manufacturing for their organization, while 36% have difficulties to understand the benefits brought by the Smart manufacturing systems/solutions. Only 16 % of SMEs currently use the Smart manufacturing systems/solutions in their organization.

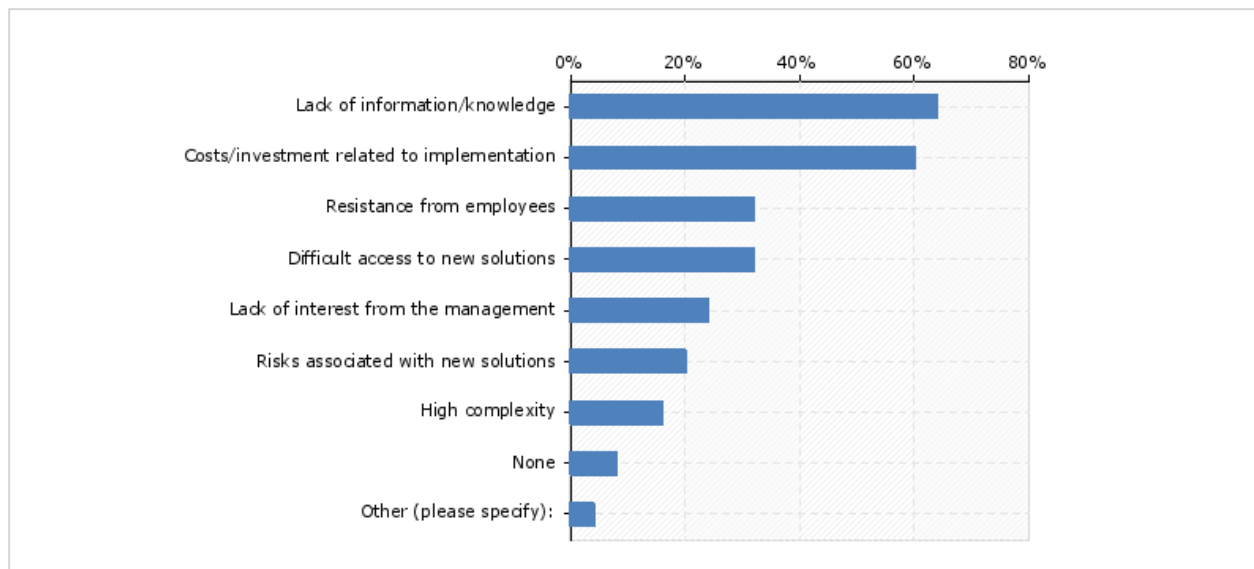
KEY MESSAGE:

From the technical view (systems and solutions) the Smart manufacturing is not well perceived among Bulgarian SMEs, as only 16 % of them use 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.

Q7 - What challenges are you facing in implementing Smart Manufacturing technologies?



The Survey results shows that for the most companies (65%) the biggest challenge for implementation of Smart manufacturing technologies and solutions is the lack of information/knowledge, followed by the Costs/investments related to implementation (60%), resistance from employees (35 %) and difficult access to new solutions (35%). 25 % of the SMEs believe that there is lack of interest from the management. A low percentage of the respondents see the risks associated with new solutions (20%) and high complexity of the solutions (15 %).

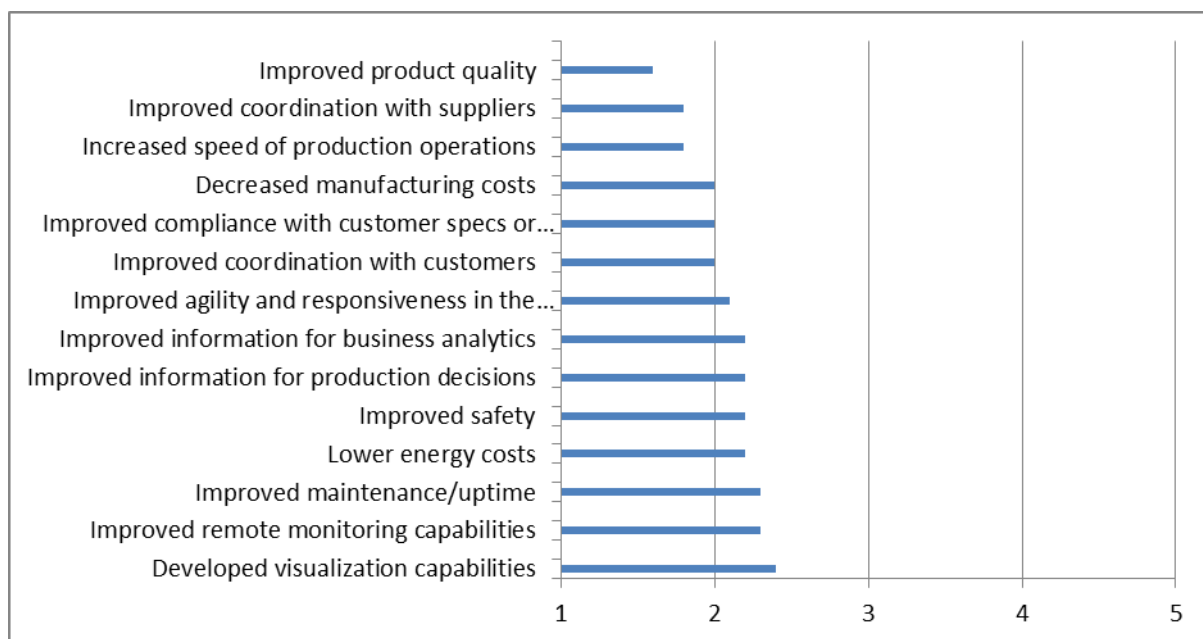
KEY MESSAGE:

SMEs are facing variety of challenges when it comes to the implementation of Smart manufacturing technologies, but the most important two are related to the lack of information/knowledge and investment for 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?



1 - Highly important 2 - Very important 3 - Important 4 - Less important 5 - Not important

From the answers received, we are able to outline few areas essential for SMEs to increase their competitiveness. The most important areas pointed by respondents are the improved product quality, improved coordination with suppliers and increased speed of productions operations, followed by decreased manufacturing costs, improved compliance with customers and improved coordination with customers.

The results show that the most important focus for SME's competitiveness are: product quality, suppliers, productions speed, production costs, customers, while areas like maintenance, safety, energy, and business analytics are of less importance. Respondents in the Survey pointed as the least important areas like monitoring and visualization.

KEY MESSAGE:

The most influential areas for increasing SME's competitiveness in the future are (i) product quality, (ii) coordination with suppliers, (iii) speed of production and (iv) manufacturing costs

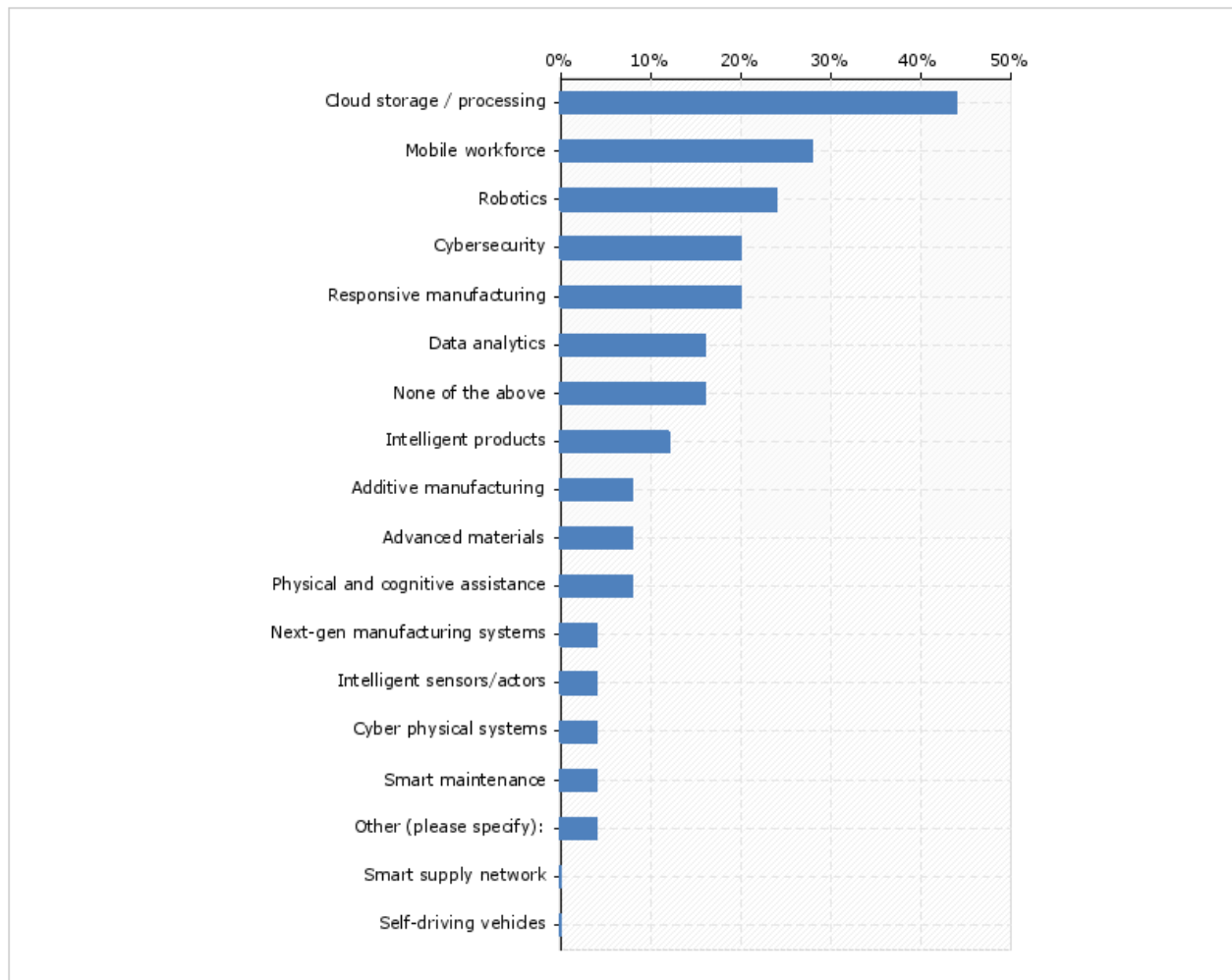
2.5 KEY QUESTION 5: What are the current state-of-art and future plans/strategic orientation for implementation of SMEs in relation to all three areas of intervention?

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.

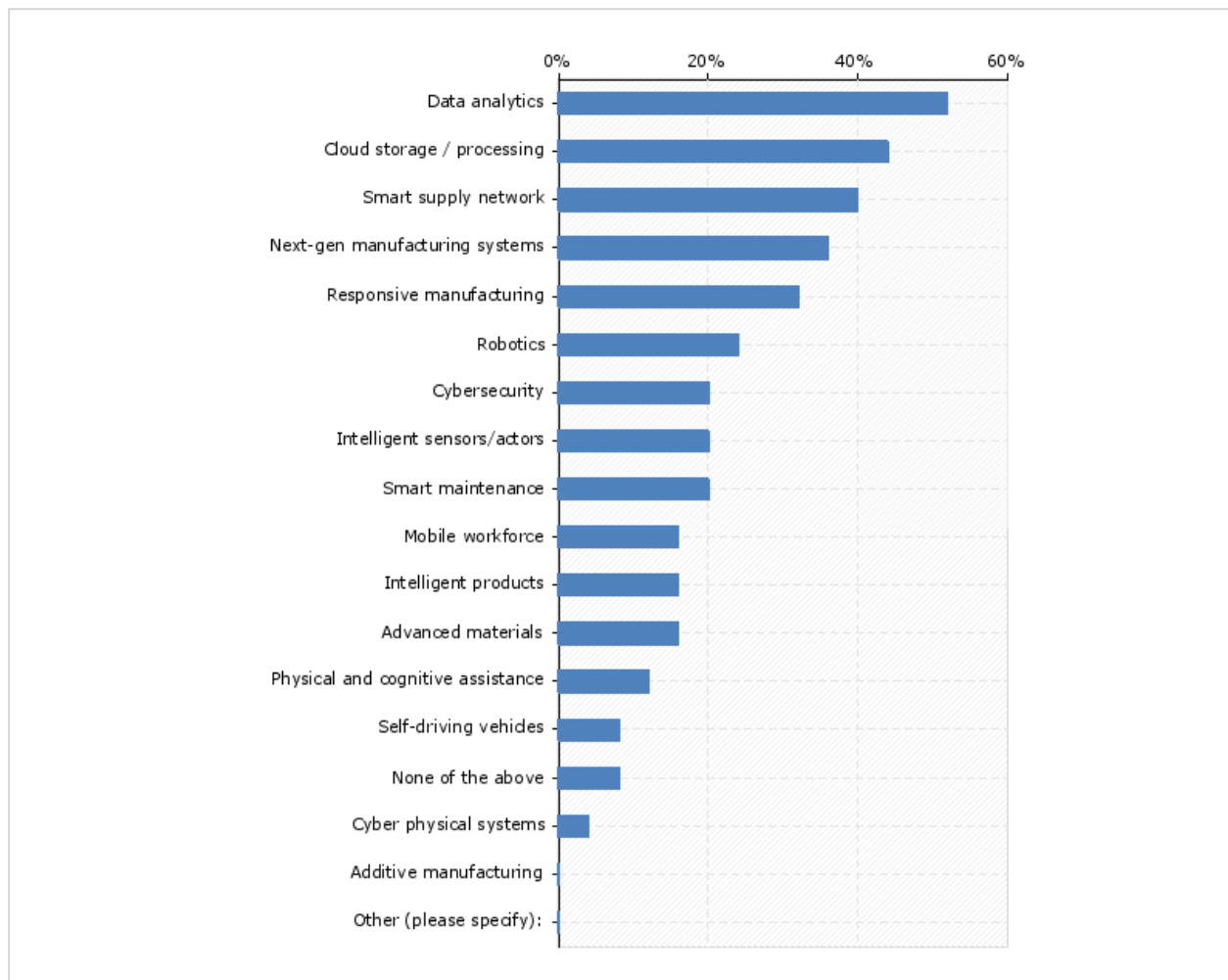
Q10 - What kinds of novel technologies are currently implemented in your company?



The chart above shows that less than 20 % of Bulgarian SMEs – responded In the Survey - don't use any novel technologies in their manufacturing process. Bulgarian SMEs that answered they use novel solutions, are using cloud storage/ processing (44 %), mobile workforce (28 %) and

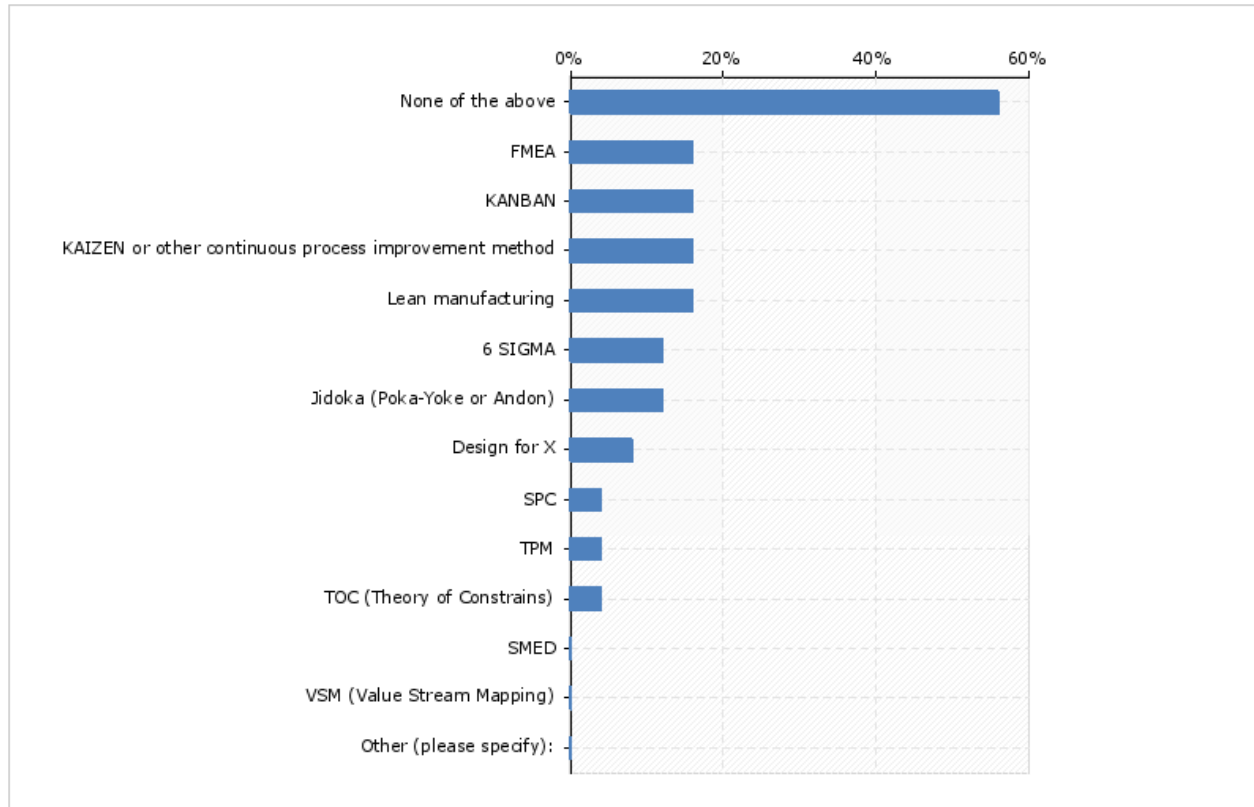
robotics (25 %), cyber security (20%) and responsive manufacturing (20%) Less than 20 % of the respondents implemented solutions such as: data analytics, intelligent products, additive manufacturing, advance materials, physical and cognitive assistance, next – gen manufacturing systems, intelligent sensors, cyber physical systems and smart maintenance. None of the SMEs replied with Smart supply network and Self driving vehicles.

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



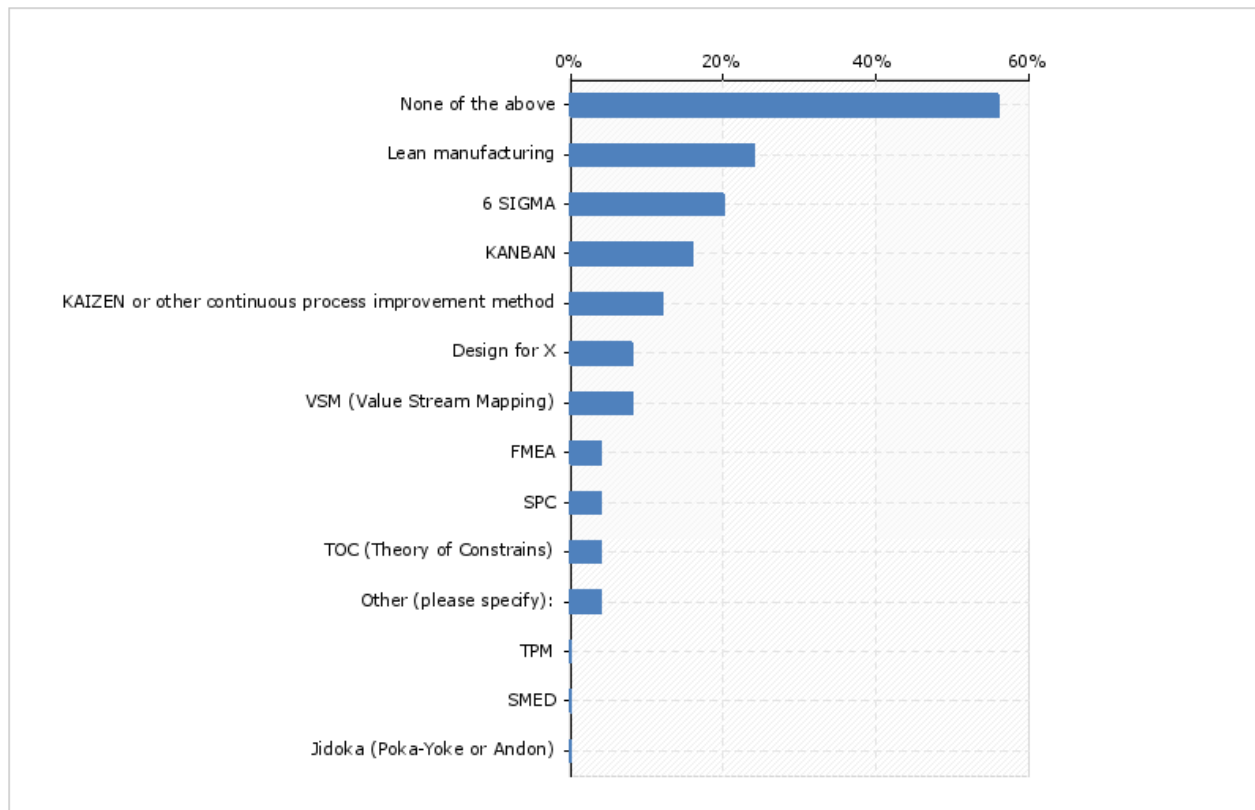
Almost all organizations answered that they are willing to implement at least some new technologies in the future. The most of the respondents (53%) are planning to implement technologies related to data analytics, followed by the cloud storage/processing (45 %), and smart supply networks (40 %).

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



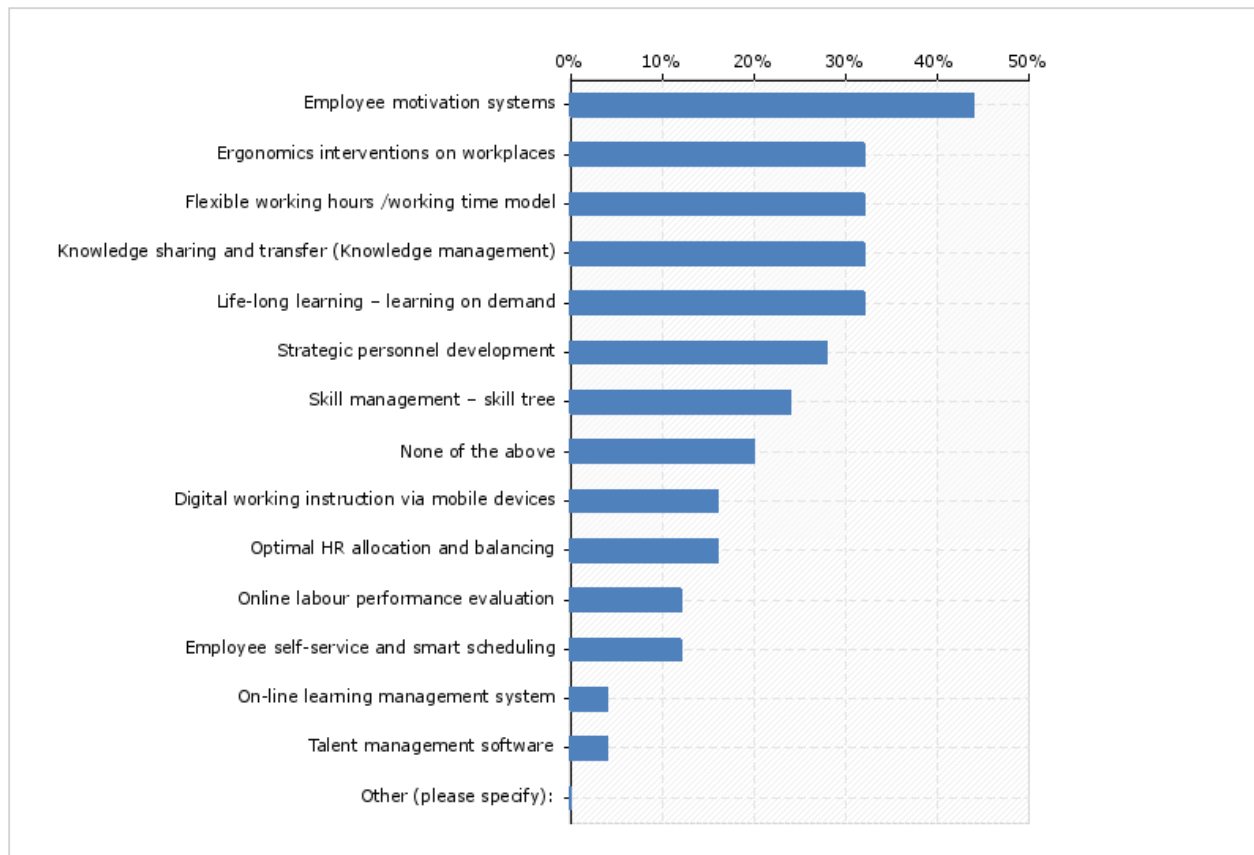
Solutions/methods related to the production process are currently not implemented in almost 60% of organizations. The ones who have implemented new methods (less than 20 %) choose the FMEA, KANBAN, KAIZEN, Lean manufacturing, Sigma and Jidoka. Design for X, SPC and TOC were chosen by less than 10% of organizations. None of the respondents answered with SMED or VSM.

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



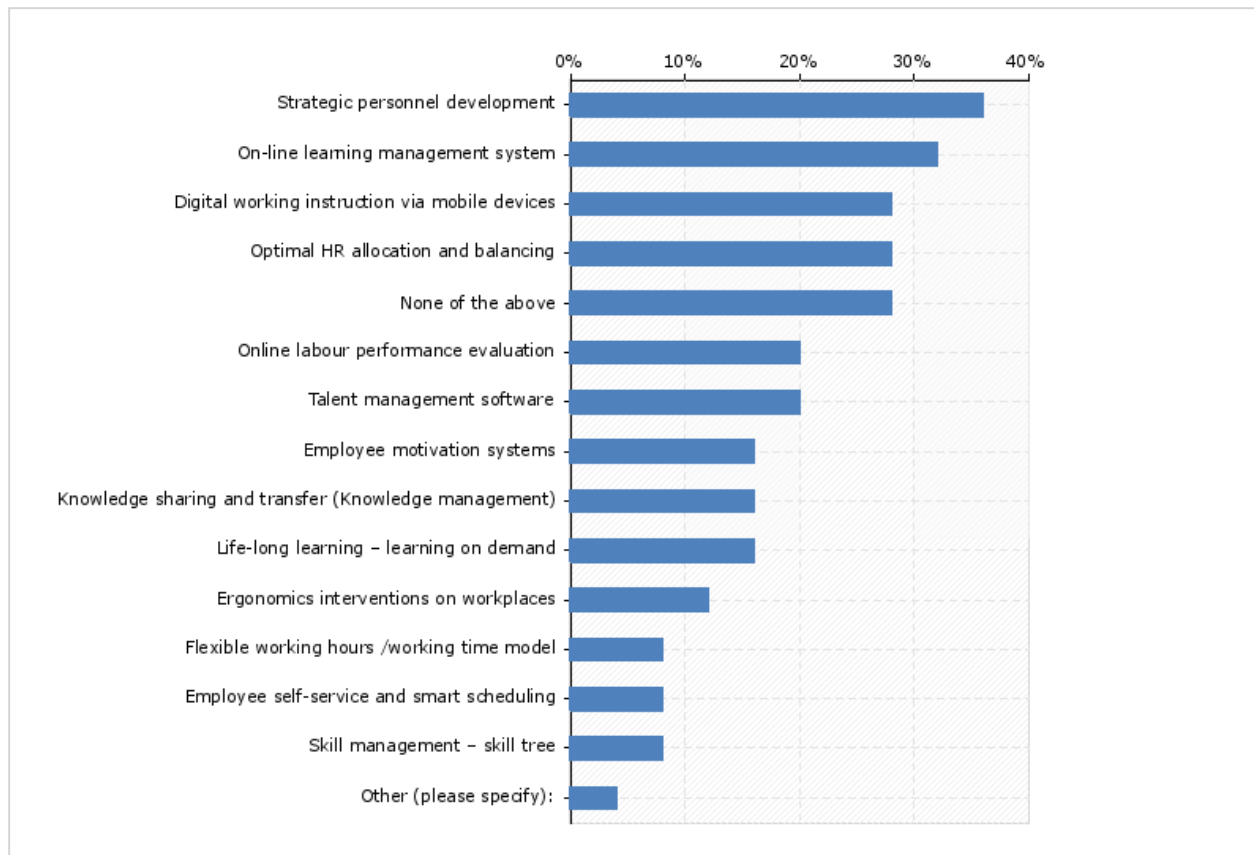
The future plans from organizations are very modest, as majority of them answered that they won't be implementing new solutions/methods for the production process (58%). The ones, who are planning to implement novel solutions, have chosen the answers: Lean manufacturing (25%), SIGMA (20%), KANBAN (18 %), KAIZEN (15 %), Design for X and VSM (10 % each). None of the respondents answered with TPM, SMED and Jidoka.

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



Unlike technologies and production processes, many SMEs have already implemented human resource management. The most used is employee motivation system (45%), followed by Ergonomic interventions on workplaces (32 %), Flexible working hours (32%), Knowledge sharing and transfer (32 %) and life-long learning (32%). There are still around 20% of SMEs who do not use any of the solutions/methods related to the human resource management.

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



In the future, SMEs are planning to implement Strategic personnel development (37%), and online learning management systems (33%). The answer none of the above is selected by the 28% of the respondents.

KEY MESSAGE:

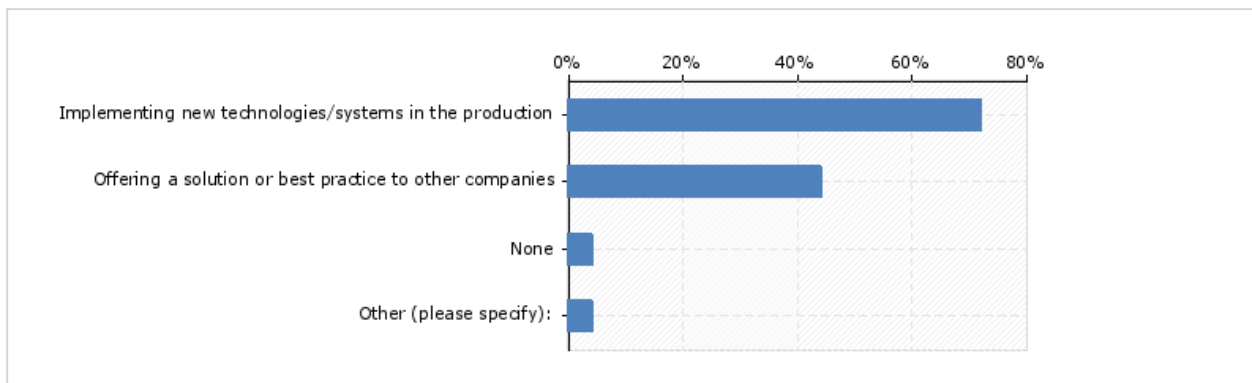
20 % of Bulgarian SMEs – responded in the Survey are currently not implementing any novel technologies and almost 60 % of the organizations are not implemented any solutions/methods in the production process

SMEs do have plans to become more active in the future, by implementing technologies related to data analytics, cloud storage/processing and smart supply networks. Lean manufacturing is considered the most favourite production process optimisation systems, while Strategic personal development is the most selected HR management system to be implemented in the future.

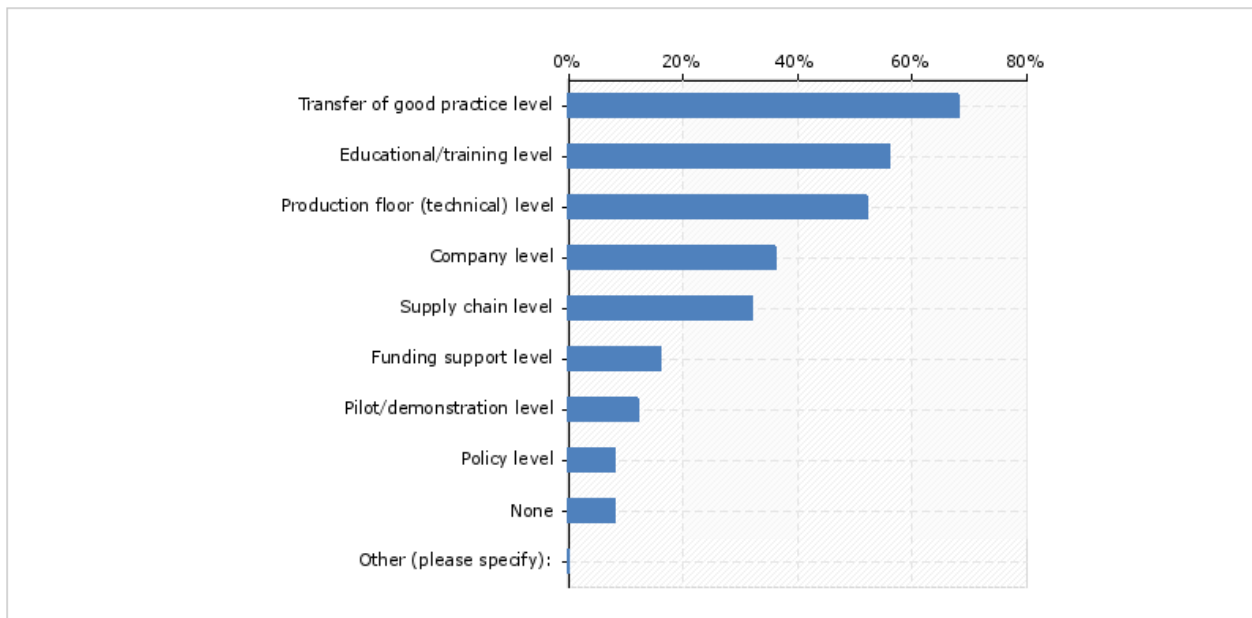
2.1 KEY QUESTION 6: Would SMEs be willing to cooperate, in which areas and at what levels?

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?



Most of the organizations are production oriented companies who are willing to implement new technologies/systems in the production (73%), 5 % answered that they are not interested in such cooperation. 43 % of the organizations answered that they would like to become the solution provider or best practice showcase to other companies.

Majority of SMEs would appreciate cooperation on transfer of good practice level (70%), followed by Educational/ training level (58 %) and production floor (technical) level (55 %).

KEY MESSAGE:

95 % of Bulgarian SMEs are willing to cooperate in the future, predominantly acting as “receivers” of new technologies and systems. They are mostly interested in cooperation in the field of transfer of good practices, education/training and technical cooperation at the production floor.

3 Conclusion

SMEs in Bulgaria were not involved in preparation of the Smart specialization strategy, however around 30% of them are aware of the existence of such strategy.

Bulgarian SMEs understand the impact of Smart manufacturing (in general) for their company – 64 % already understand the benefits, but only 16 % of SMEs are already implementing technologies, solutions or methods related to smart manufacturing.

The difficulties related to the implementation of novel technologies facing most of the companies are related to the lack of information and knowledge and also investments for their implementation. Other companies have troubles with resistant from their employees and difficulties in access to new solutions.

Bulgarian SMEs are mostly interested in introduction of new technologies and think that the most influential areas for their competitiveness are improved product quality, improved coordination with suppliers, increased speed of production and decreased manufacturing costs.

Current state-of-art shows that around 18 % of SMEs are still not implementing any novel technologies and 25 % are not implementing any of the modern trends in Human resources management. Almost all organizations are willing to implement different technologies, solutions or methods related to smart manufacturing in the future.

95 % 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 transfer of good practice level. On the other hand, respondent are also willing to cooperate on educational/ training level or the production floor level.