DOCUMENT TITLE:

CRITICAL FACTOR SME DIAGNOSIS REPORT FOR CROATIA

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
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RE	Restricted to a group specified by the consortium	
CO	Confidential, only for members of the consortium	

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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	*26*	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 Croatia has been conducted from 16th March until 07th of July 2017. Mainly we have been targeting smaller production oriented SME's from Croatia. 146 SME representatives entered the survey, while the success rate was 18%, which means that we finally managed to receive 26 completed questionnaires.

Response rate (?) Base: Entered intro

Status	Frequency	State
Entered intro	146	100%
Entered first page	80	55%
Started responding	44	30%
Partially completed	44	30%
Completed	26	18%
Unit usability (50%/80%)		
Usable units	24	100%
Partially usable units		0%
Unusable units		0%
Breakoffs		
Introductory breakoffs	102	70%
Questionnaire breakoffs	18	12% (neto 41%)
Total breakoffs	120	82%

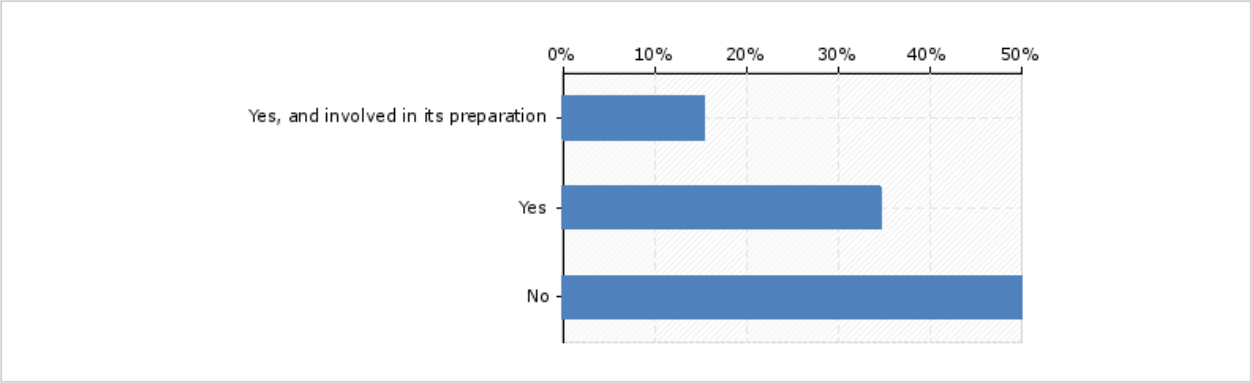
Below we are providing the analysis of the results based on the key questions set out in the questionnaire development.

2 Survey results for Croatia

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.



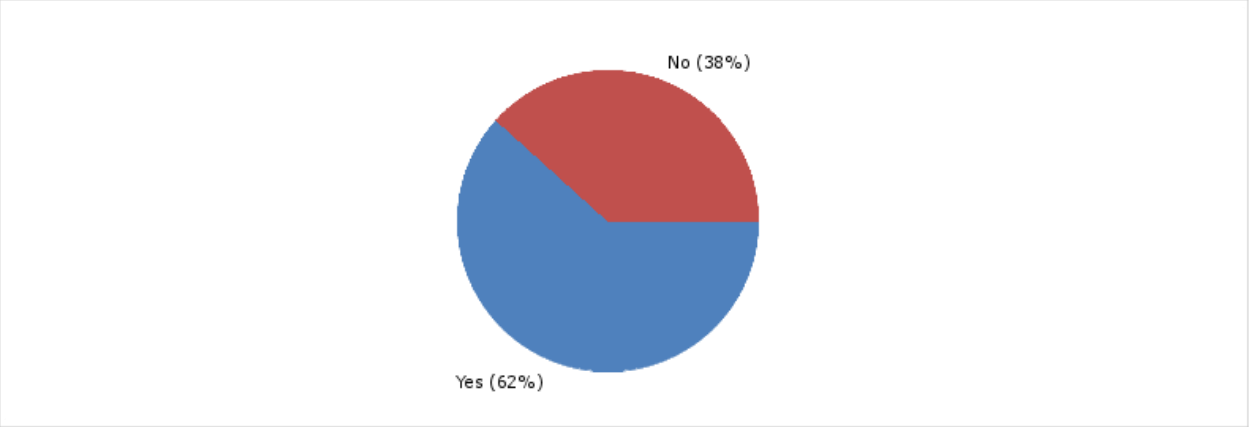
Based on answers to the first question we are able to conclude that 50% of companies are not familiar with the Smart Specialization. The other half of companies are familiar with the strategy but only 15% was involved in its preparation.

KEY MESSAGE:
Some SMEs have been involved in development of the Smart Specialization strategy (15%), while 50% of SMEs are not familiar with Strategy.

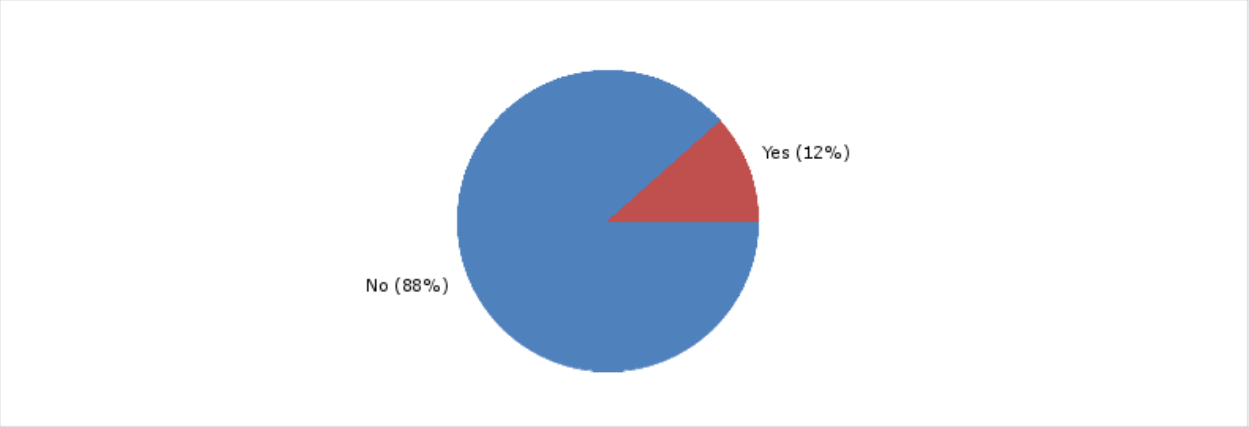
2.2 KEY QUESTION 2: How well is Smart Manufacturing perceived at strategic and spread at operational level (maturity of Smart Manufacturing in the SMEs)?

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?



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



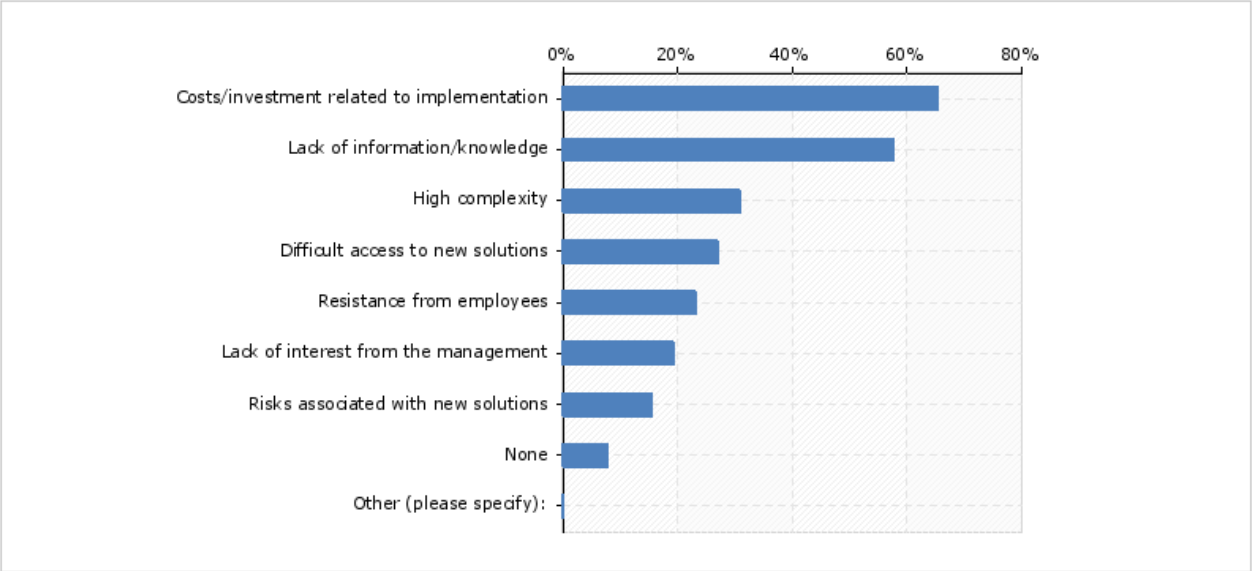
Based on answers to the question 4 we are able to conclude that 62% of companies understand the benefits of Smart manufacturing for their organization, while 38% have difficulties understanding the benefits brought by the Smart manufacturing systems/solutions. Only 12% of SMEs currently use the Smart manufacturing systems/solutions in their organization.

KEY MESSAGE:
From the technical view (systems and solutions) the Smart manufacturing is well perceived among Croatian SMEs, but only 12% 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.

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



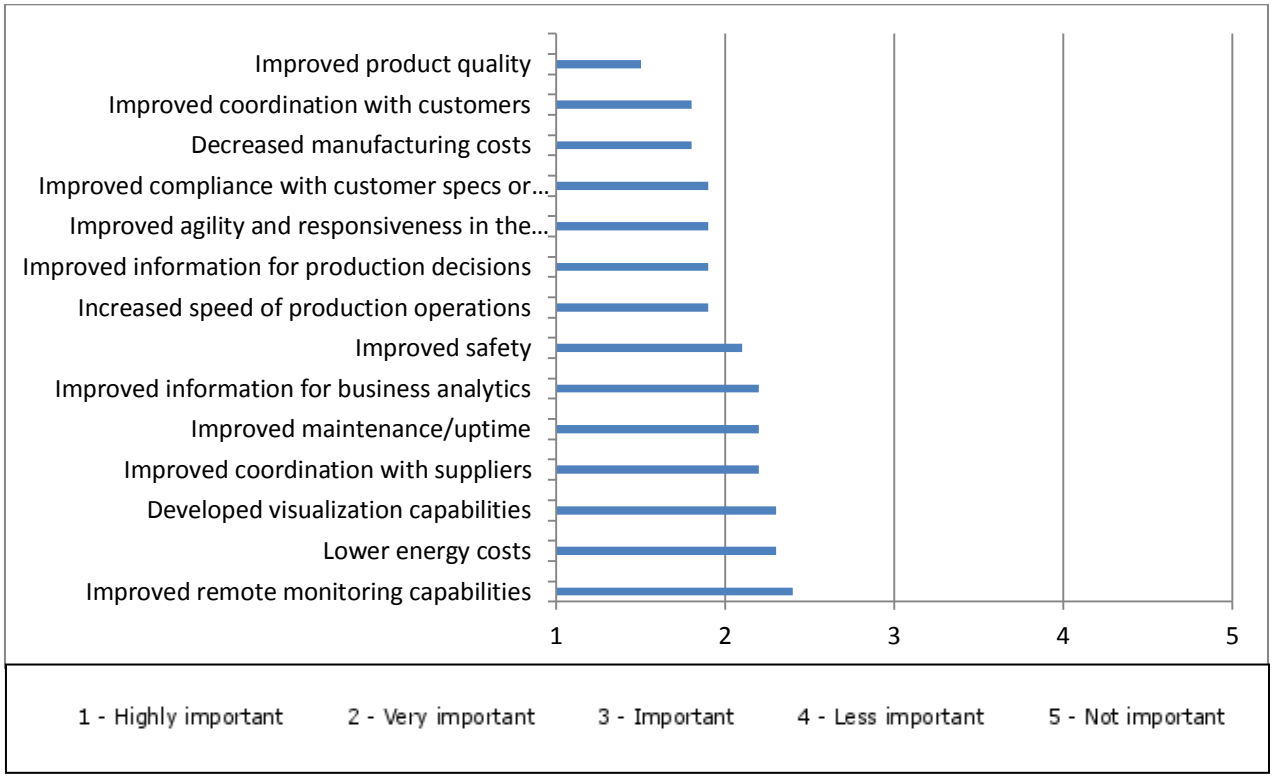
The most organizations (65%) believe that the biggest challenge for implementing Smart manufacturing technologies and solutions is in the Costs/investments related to implementation, which is followed by the lack of information/knowledge (55%) and high complexity linked to Smart manufacturing (35%). SMEs is some occasions also believe that it is difficult to access new solutions (30%), while resistance from employees (25%) are lower. Lack of interest at the management level is on the 6 th place with 20%.

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 investments and 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?



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 area will be the improved product quality and improved coordination with customers, which is followed by decreased manufacturing costs, improved compliance with customer specs or regulatory requirements, improved agility and responsiveness. All those areas are classified as highly important. The other areas like monitoring, visualization and lower energy costs are very important but no areas are classified as just important, less important or not important.

KEY MESSAGE:

All areas are highly or very important and the most influential areas for increasing SME's competitiveness in the future are (i) product quality, (ii) coordination with customers, (iii) manufacturing costs and (iv) improved compliance with customer specs or regulatory requirements.

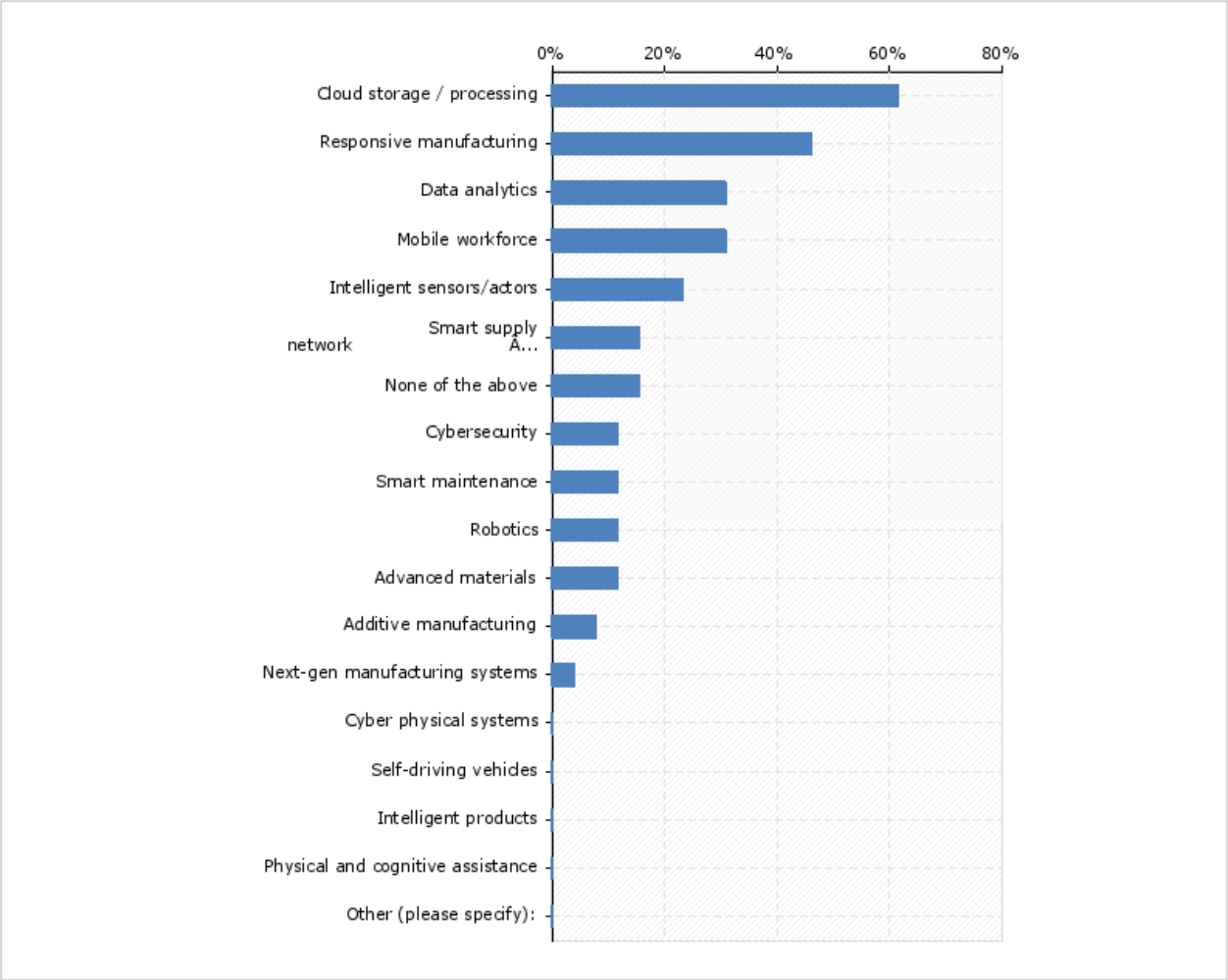
2.5 KEY QUESTION 5: What are the current state-of-art and future plans/strategic orientation for implementation of SMEs in relation to all three areas of intervention?

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.

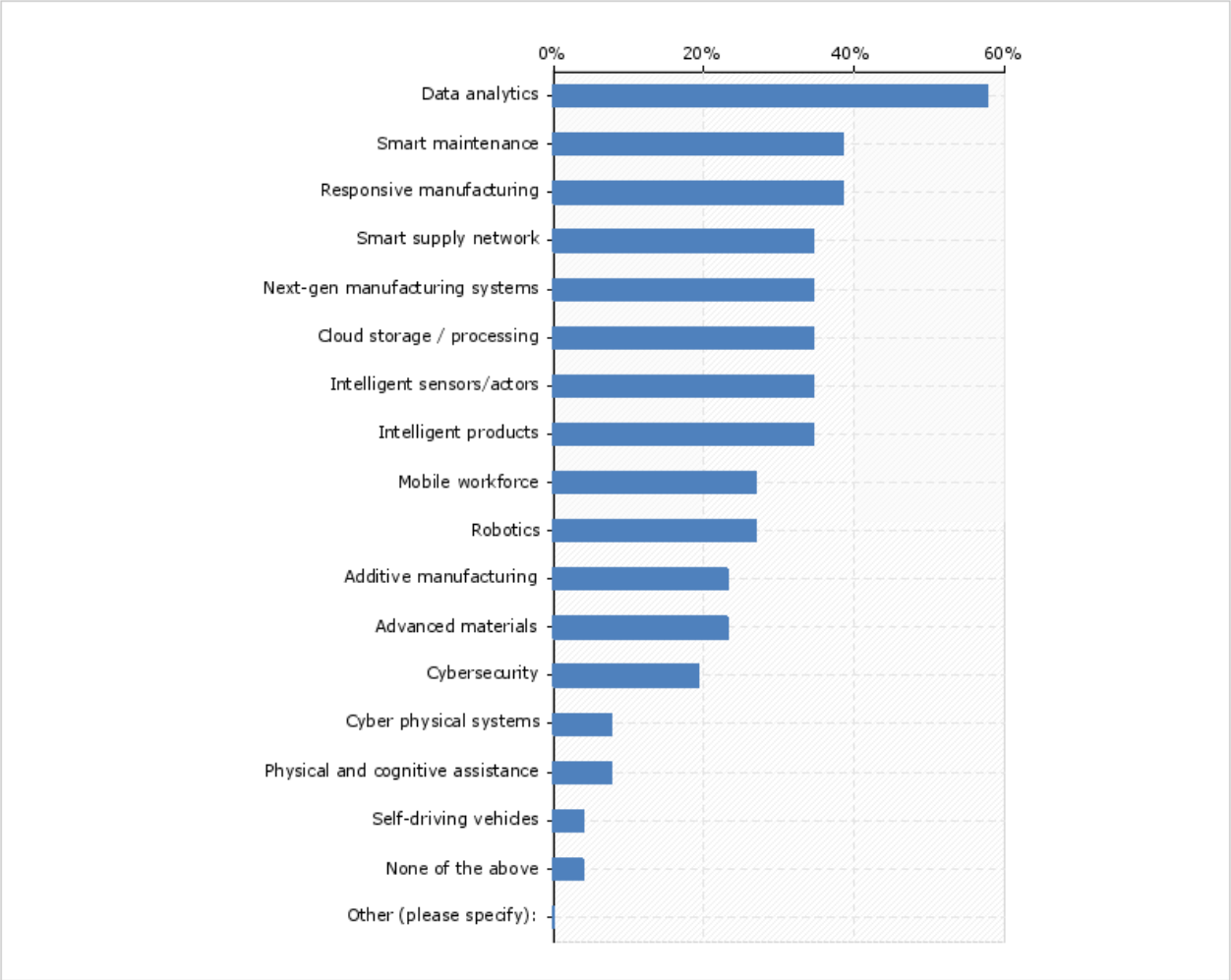
Q10 - What kinds of novel technologies are currently implemented in your company?



As seen above, Croatian SMEs are currently using cloud storage/ processing, responsive manufacturing, data analytics, mobile workforce and intelligent sensors. Those solutions are used by more than 20% of organizations while others are used less. Some solutions like cyber

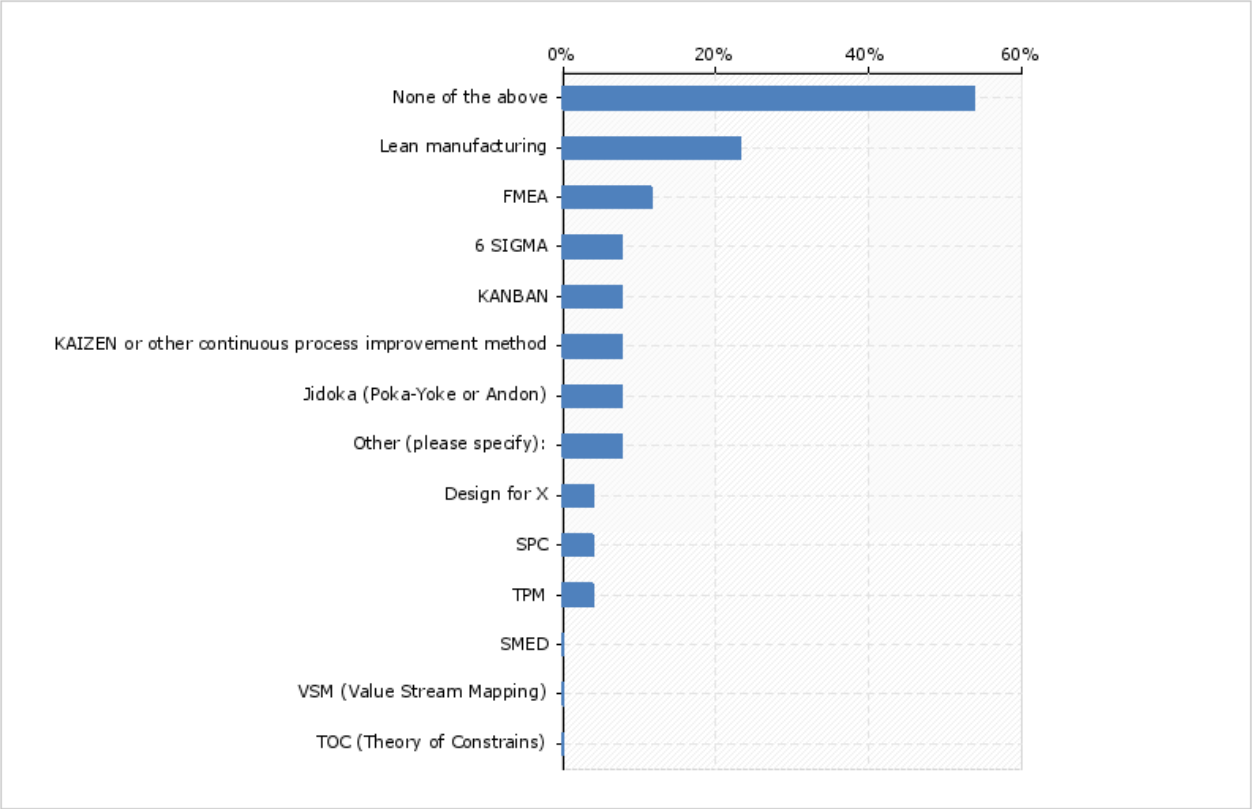
physical systems, self-driving vehicles, intelligent products and physical cognitive assistance aren't used at all.

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



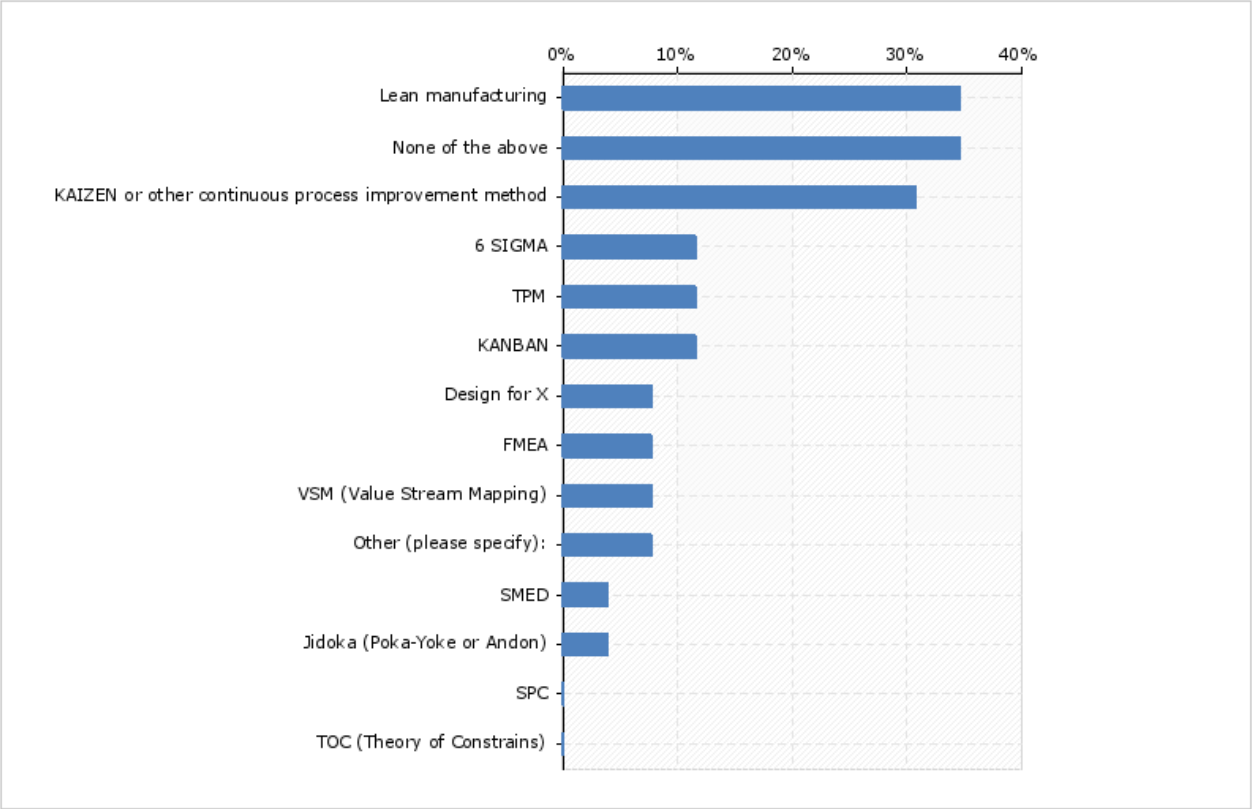
Almost all organizations answered that they are willing to implement at least some new technologies in the future. The most organizations (55%) are planning to implement technologies related to data analytics, which is followed by the smart maintenance and responsive manufacturing (40%).

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



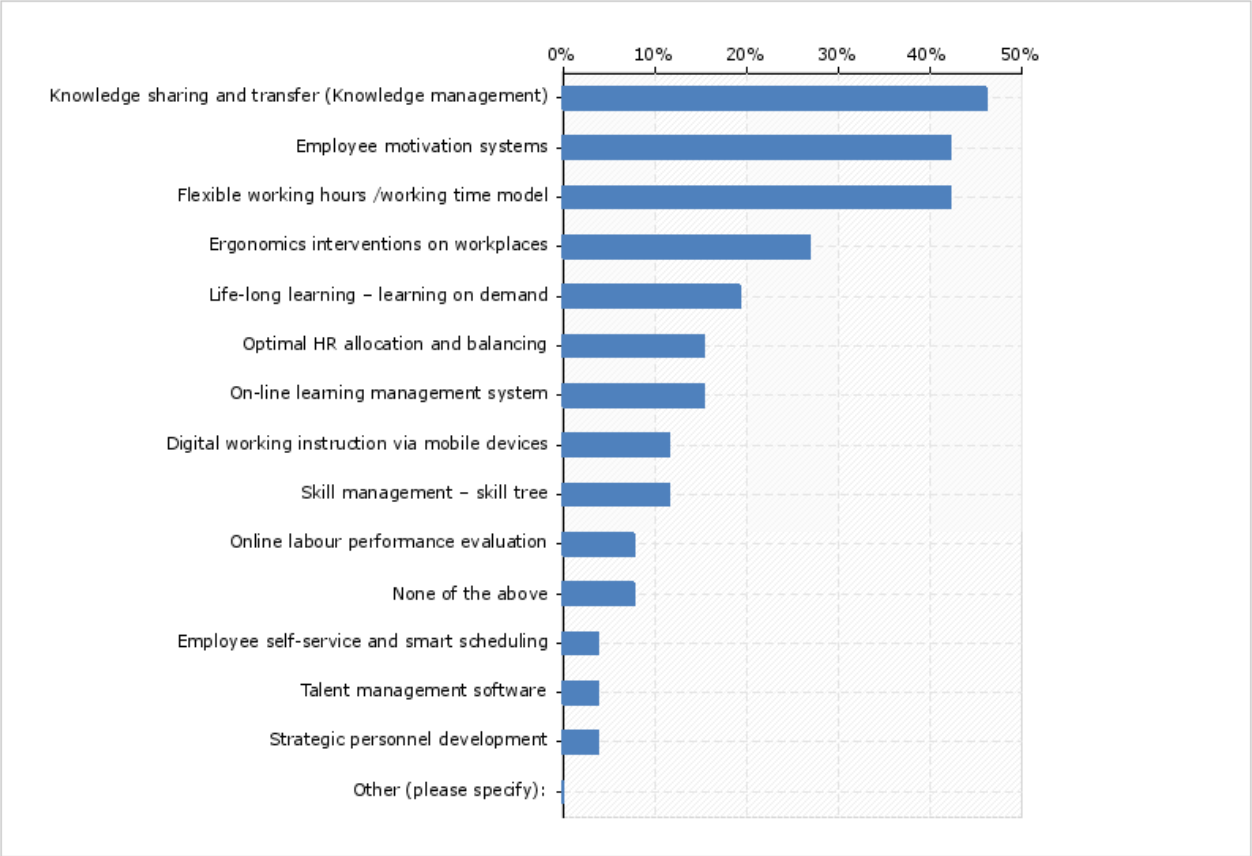
As seen above, 55% of SMEs are currently not using any solutions/methods related to the production process. The ones who have implemented new methods choose Lean manufacturing (25%) and FMEA (10%). Less than 10% have implemented 6 SIGMA, KANIBAN, KAIZEN and other methods.

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



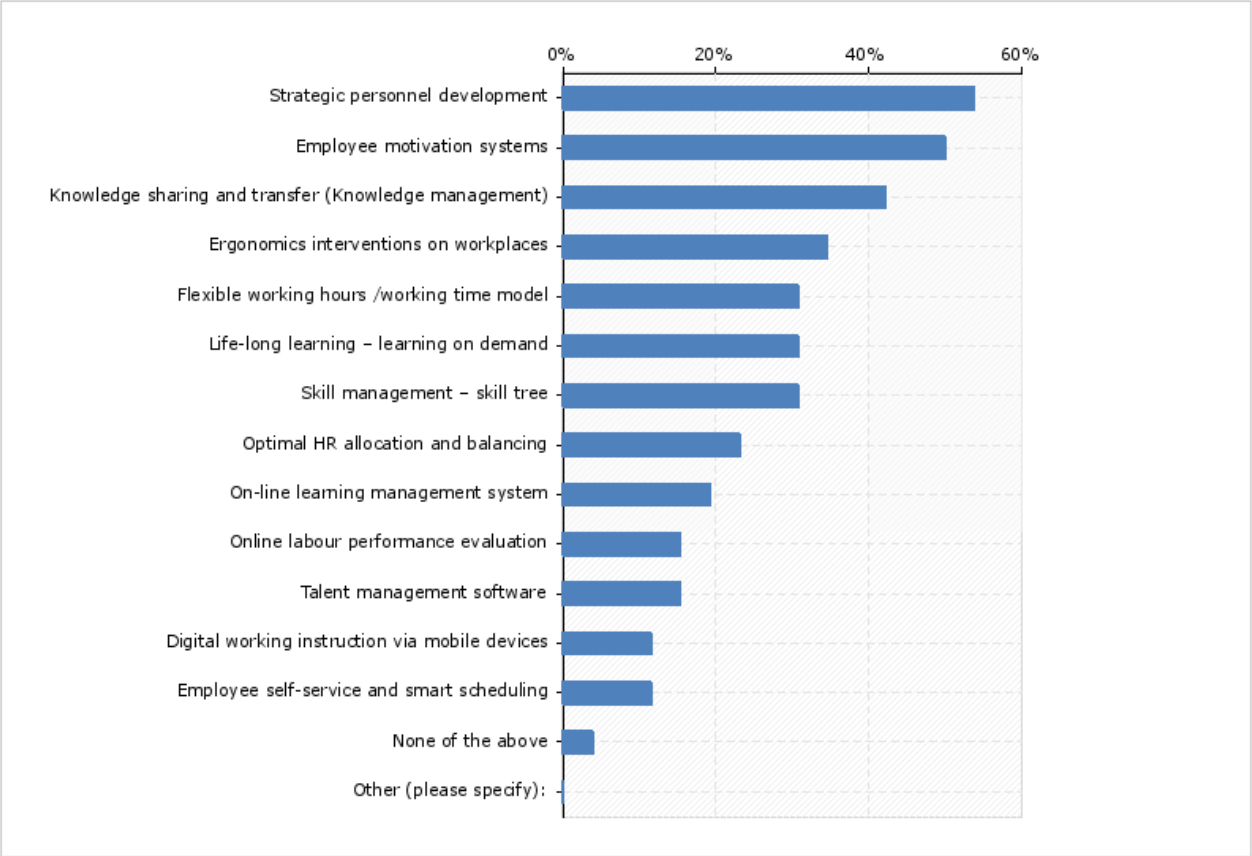
In the future, SMEs will be mostly looking to implement Lean manufacturing (35%) and KAIZEN (30%) and 35% of them answered that they won't be implementing new solutions/methods for the production process.

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



The most used solutions/methods related to human resource management is Knowledge sharing and transfer (45%), followed by employee motivation system and flexible working hours (40%). Around 10% of SMEs 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 will be mostly looking to implement strategic personnel development (55%), Employee motivation system (50%) and Knowledge sharing and transfer (40%). Only less than 10% of organizations selected none of the above.

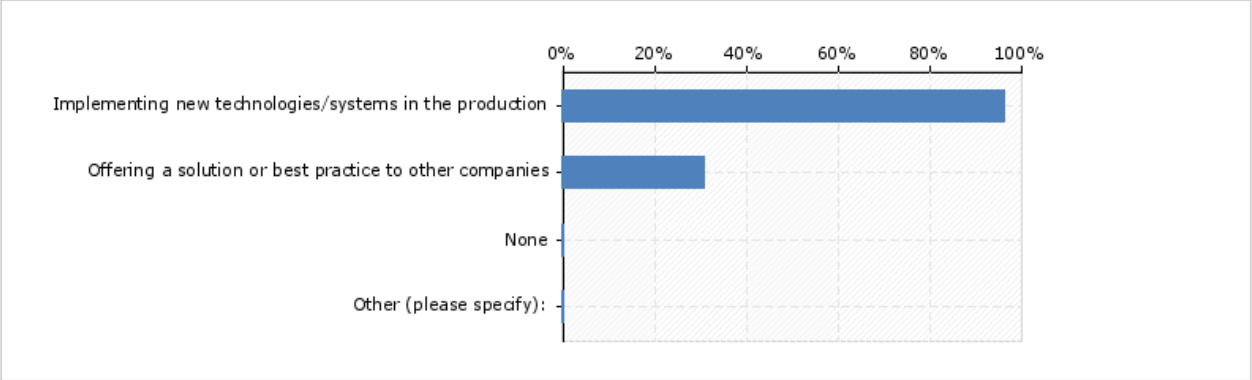
KEY MESSAGE:

Croatian SMEs are currently using some novel technologies as Cloud storage/ processing, Responsive manufacturing, Data analytics, Mobile workforce and intelligent sensors. Companies with not implemented any smart manufacturing novel technologies or solutions/methods related to production processes have plans to become more active in the future and implement some. Lean manufacturing is considered the most favourite production process optimisation systems, while Strategic personnel development is the most selected HR management system to be implemented in the future.

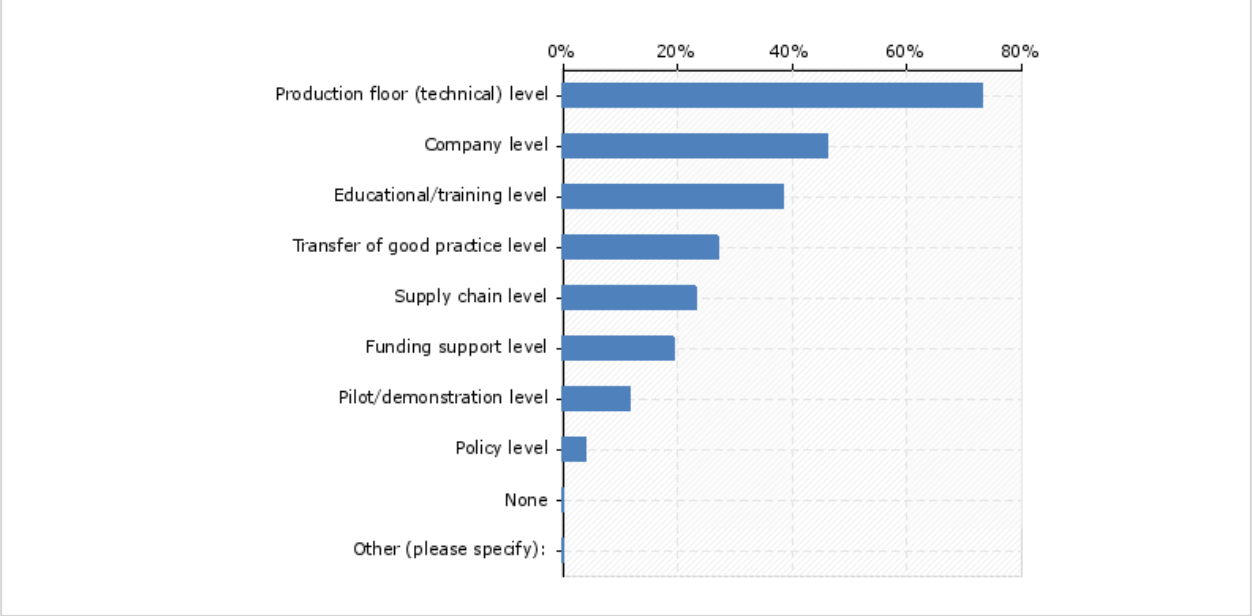
2.6 KEY QUESTION 6: Would SMEs be willing to cooperate, in which areas and at what levels?

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 interesting to see that most of the organizations are production oriented companies who are willing to implement new technologies/systems in the production (95%) and 30% answered that they would like to become the solution provider or best practice showcase to other companies.

Majority of SMEs would appreciate technical cooperation at the production floor (75%), followed with cooperation on company level, educational/training level and transfer of good practice level.

KEY MESSAGE:
Almost all Croatian SMEs are willing to cooperate in the future, predominantly acting as ‘’receivers’’ of new technologies and systems. They are mostly interested in the technical cooperation at the production floor.

3 Conclusion

Some of Croatian SMEs were involved in preparation of the Smart specialization strategy, while 50% of them are not aware of the existence of such strategy at the policy level. 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 slowly starting to use the smart manufacturing solutions, technologies and methods. Close to 65% understand the benefits of this, while only 12% of SMEs are already implementing technologies, solutions or methods related to smart manufacturing.

There are still difficulties related to the implementation, since many consider costs related to implementation challenging, while others have troubles with lack of information and high complexity of novel technologies and solutions. Croatian SMEs are still interested in introduction of new technologies and think that the most important fields for their competitiveness are improved product quality, improved coordination with customers, decreased manufacturing costs and improved compliance with customer specs or regulatory requirements.

Current state-of-art shows that around 60% of SMEs have implemented novel technologies as cloud storage/ processing and responsive manufacturing, while they pay less importance to human resource. The good thing is that they have intention to implement different technologies, solutions or methods in the future.

Croatia has a very solid ground when it comes to current or future implementation of smart manufacturing technologies or solutions. Everybody is 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 the production floor level, followed with cooperation on company level, educational/training level and transfer of good practice level, which shows their desire to be very concrete when it comes to following new trends in production and raise of their competitiveness.