

COMPETITIVE MARKET-BASED DESIGN, TECHNOLOGY AND TESTING CENTER IN WOOD INDUSTRY AS THE WOOD ACADEMIA IN BOSNIA AND HERZEGOVINA

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SUMMARY

The Wood processing is one of the three sectors in BiH that have a positive trade balance. This sector participates in total exports with 12.6% or in absolute terms, export of wood sector back in 2016 was 1.188.865,450 BAM out of BAM 9,417 billion of total exports from BiH. The share of wood processing in GDP is 3.08% with 35,975 employees in 1,642 companies in BiH. The share of exports was 12.6%, and by comparison with 1991, the share in GDP was 10% (about 3 billion USD) and participation with 11% of exports from BiH [2].

The wood processing sector in BiH is characterized by a large gap between its current performances and its real potential. Due to the influence of the transition and privatization processes, some very large, sophisticated, fully-integrated companies were disintegrated or even collapsed. Within this period, their technologies and equipment became obsolete; as a result, many factories for final wood processing are still not working in their full capacity. The local furniture industry is obliged to import particleboard and MDF. BiH has a traditional joinery industry with a good reputation in Europe. Most of the companies are small to medium size and they use domestic sawn softwood and hardwood for raw material. Some of producers have their own sawmill to guarantee consistent supply and quality. There are joinery facilities in every area of BiH. Technical skills exist thanks to a long tradition in the sector, but additional investment in continuing education / modernization is needed [1].

In this article, we used those key factors as a basis to identify potential high impact information and communications technology (ICT) applications that could become core offerings of the Center for design, technology and testing that is to be established for the wood sector in Bosnia and Herzegovina. The findings will be presented to Bern University of Applied Centre. This briefing paper identifies the high impact ICT applications that could be used to provide the core offerings of the Wood Academia and presents a concise analysis of the market factors within BiH and internationally that would affect BiH SME's demand for and use of the specialize services. The major conclusion of this article is that SMEs from BiH in the wood processing industry have important opportunities to move value chain and compete in higher value-added niches (e.g., high quality, rapid-response, tailored products), as well as to improve their efficiency, rather than simply attempting to compete on the basis of cost [3].

1. INTRODUCTION

In March 2017, Prof. Ismar Alagić prepared an initial briefing paper, which presented a summary of the key factors related to the competitiveness of the wood products sector in BEAR region and even wider in the whole Bosnia and Herzegovina. The Author used those key factors as a basis to identify potential high impact information and communications technology (ICT) applications that could become core offerings of the Center for design, technology and inspection that is to be established for the wood sector. The findings has been presented to Bern University of Applied Centre.

Building on the initial briefing paper, Prof. Ismar Alagić conducted a market analysis of the potential high impact ICT applications that the briefing paper had identified. Through the market analysis, the project gained a more in-depth understanding of the market opportunities for the Center that would offer services based on the high impact ICT applications. This briefing paper identifies the high impact ICT applications that could be used to provide the core offerings of the Wood Center and presents a concise analysis of the market factors within BiH and internationally that would affect BiH SME demand for and use of the specialize services. It is important to note that this briefing paper is not intended to provide a detailed market analysis of the wood industry; rather, it distills the industry conditions in order to determine which ICT applications could help to significantly improve the competitiveness of the sector's small and medium enterprises (SMEs).

This article assesses the status of Small and Medium-sized Enterprises (SME) in BiH wood processing sector, within the scope of work of Wood Academia and Centre for design, technology and inspection in forestry and wood processing sectors. The focus of this report also highlights the proposal for Point of Interventions (POI) within the Wood Academia and above mentioned Centre.

A database of wood processing companies developed by Prof. Alagić and was used in constructing the sample. Prof. Alagić used stratified random sampling to select 30 companies from throughout Bosnia and Herzegovina from this database. In terms of their primary business, companies are commonly involved in more than one activity. The greatest number of business registrations are for firms doing business as construction joinery producers, furniture producers and veneer or board producers.

During March 2017, Prof. Alagić completed several sessions of consultations with representatives of wood processing companies, Business Support Organisations (BSOs) and education institutions. They provided valuable information derived from their experience in order to meet requirements of this survey.

The major conclusion of this report is that SMEs from Bosnia and Herzegovina in the wood processing industry have important opportunities to move value chain and compete in higher value-added niches (e.g., high quality, rapid-response, tailored products), as well as to improve their efficiency, rather than simply attempting to compete on the basis of cost.

This project paper and suggested consultancy and training services that the Centre provide are geared towards enabling these SMEs to take full advantage of these opportunities.

2. WOOD PROCESING INDUSTRY IN BOSNIA AND HERZEGOVINA

Wood industry is one of the most important branches of the manufacturing industry of Bosnia and Herzegovina. It is significant exporter and year after year it even increases surplus. However, the general evaluation is that the use of forest resources and the available wood processing capacity is not satisfactory. The total export of wood industry in FBiH, and the whole BiH, exports of furniture has not reached pre-war levels. Development role of the wood industry in the economy of both entities is to permanently maximum increase exports and reduce trade deficit. If you provide the right

conditions, this sector can develop rapidly, with the increase in production at an average annual rate of 10%. In order to revive and raise production, the following strategic goals should be set to provide the necessary conditions for faster and better development of the wood industry:

- Improving relations between forestry and companies engaged in wood processing;
- Defining target products and support to exports of higher levels of processing;
- Promoting companies and joint market presentation.

As already stated, wood processing is one of the three sectors in BiH that have a positive trade balance. This sector participates in total exports with 12.6% or in absolute terms, export of wood sector back in 2016. was 1.188.865,450 BAM out of BAM 9,417 billion of total exports from BiH. The share of wood processing in GDP is 3.08% with 35,975 employees in 1,642 companies in BiH. The share of exports was 12.6%, and by comparison with 1991, the share in GDP was 10% (about 3 billion USD) and participation with 11% of exports from BiH.

This sector also has several sub-sectors: wood and wood products (lumber, panels, veneer, joinery, parquet floors, wooden packaging, etc.), furniture and prefabricated wooden construction. The export of BiH in 2016. is presented in figure 1.



Figure 1. The export of Bosnia and Herzegovina by category of products.

Targeting products should lead to lower exports of sawn timber in favour of making products of higher stages of finalization and simultaneously strengthen the competitive ability of enterprises and improve the quality of certain products. This approach means first of all improving investment for provision of equipment and introduction of modern technologies in the final wood processing. In addition to significantly improving the quality it is necessary to emphasize and direct export to neighbouring countries, the EU and Russia. As the competitiveness of the market depends on the quality of the products, therefore the modernization of production is a precondition of growth in production, exports and survival of the conquered foreign markets. Development role of the wood industry in the economy is a permanent increase in exports of wood products in particular with a higher degree of processing in order to reduce foreign trade deficit. Key to the success of the furniture industry in the future is in exports, but in order to succeed it is necessary to know the foreign market and improve the production process in order to meet the requirements of foreign demand through good design, surface treatment, flexible production and the creation of clusters, mutual cooperation in order to strengthen competitiveness and establishing an adequate marketing mix.

Marketing mix is not possible if the extensive way of doing business (there is a product, the customer is required and the product is sold at a low price) is not replaced with the intensive production focused exclusively on meeting the needs of foreign customer. In this regard, the strengthening of cooperation and the formation of clusters between manufacturers in the wood industry is essential to maximize the use of all production capacities and increase production readiness. This would reduce the need for investments, improve productivity and quality through specialization of production, reduce costs and the creation of individual clusters would provide a mutual support in the international market and not competition. Information and communication technology is the most important infrastructure of the 21st century and, together with education and training is becoming the biggest factor of growth and prosperity. The use of information and communication technologies in international business is a key to success and enhances the competitive readiness in terms of technology.

The current points of weakness in the wood processing sector in BiH are:

- low level of finalization in production;
- high production costs;
- low utilization of production capacity;
- insufficient investment in technological development;
- the absence of a joint appearance on foreign markets;
- unsatisfactory design and product quality;
- slow opening of new markets and others.

3. SURVEY AND RESULTS

The market survey findings and a detailed summary of key finding is provided by Prof. ALAGIĆ. There is a significant difference between the number of high impact ICT applications identified in industry analysis and those identified during the market analysis.

Industry analysis recommended the following services:

1. CAD/CAM (computer-aided design/computer-aided manufacturing) services supporting high quality, rapid-turn-around products could serve as a core offering.
2. Design and/or manufacture parts for the wood products producers in BiH and nearby European countries, with a particular focus on “hard to produce” specialty pieces
3. Fee-based CAD/CAM and CNC (computer numerical control) training for furniture manufacturers.

However, the market research recommends the following services:

4. 3D CAD modeling and design education
5. CNC machine operations training
6. Operations on machines for wood drying and painting
7. Education for various quality standards and scrap reduction like ISO 14001, Chain of custody, FSC, optimization of wood cutting, etc.
8. Education in using and implementing expert literature and technical documentations
9. Industry announcements, training calendar, business directory, industry tenders using Internet
10. Match making service; demand – supply using Internet
11. Export assistance
12. Legal advice in wood industry
13. Environment, cost and social issues marketing
14. Machine purchasing consulting service and reselling
15. Furniture design using CAD
16. Rapid prototyping of furniture or furniture parts
17. CAD and CNC programming
18. Advance furniture manufacturing using CNC machines
19. Tools sharpening service

20. Testing and laboratory service.

The list above provides a basic overview of services that can be offered individually or in combination with some other service. It is up to Wood Center to determine the optimal mix of services that should be delivered to the market.

4. CONCLUSION

Overall, the industry analysis, market research via survey and direct interviews indicate that there is a not as single predominant service that Center for design, technology and testing in Wood Industry (Wood Center) can offer in order to reach profitability. The findings indicate that a portfolio of services is needed in order to achieve success.

The previous chapter provided a detailed analysis of each individual service that Wood Center could offer, however, it is difficult to predict the best combination. It is clear by now that the Wood Center has to start with services from at least two categories during the first year and gradually expand to others. Moreover, it is clear that some services like advance manufacturing and tools sharpening can be a good income generator, while others like education and training can only be promotional services.

Advance technologies that use CAD and CAM experts, designers and CNC programmers, can be demanding in terms of resource availability and operating costs due to high salaries of such people (compared to average in wood industry). This high operating cost problem can be potentially dangerous for Wood Center's cash flow and long term sustainability.

Finally, testing and laboratory services can effectively grant a monopolistic position to the Wood Center in BiH, but high startup costs and long-term credibility can hamper the success of the Center.

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