Commercialisation of PLC-operated pneumatic xylophone

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Aim of the Project

The Aim of the project is to design and make a commercialization report that mainly focuses on the pneumatic-operated xylophone controlled by PLC that was made in the first and second semester.

Figure 1: pneumatic-operated xylophone controlled by PLC

Background

Commercialisation,
From my knowledge and from watching videos on YouTube about what is commercialisation. Commercialisation involves the process of taking a product and making it available for sale to customers and companies, figuring out how to sell it to people who want to buy the product.

Having great commercialisation requires understanding customer needs, identifying market opportunities, developing competitive products or services, and effectively positioning them in the marketplace. Commercialisation involves securing intellectual property and financial considerations. Commercialisation is essential for transforming new ideas and driving economic growth.

Target Market

Figure 2: STEM

The pneumatic-operated xylophone controlled by a PLC can make learning STEM (science, technology, engineering, and mathematics.) subjects, and courses more enjoyable and practical for students in schools, colleges, and universities. This product/ design combines with automation, music, pneumatic, and PLC coding. This product can provide students with hands-on learning experiences with real-world experiments. Instead of reading about concepts in books.

Technology Description

Team 2B has developed a project involving a pneumatic-operated xylophone controlled by a PLC. Despite efforts to make the project unique, the xylophone could only undergo test runs by the end of the second semester. To address this, the team turned to Arduino technology, which enabled easier coding and storage of multiple songs. Over the following four months, they refined songs and enhanced the beater mechanism, resulting in improved performance and reliability of the system.

Intellectual Property

Figure 3 : Intellectual Property

Intellectual property (IP) rights are integral to the successful commercialisation of innovative products like the pneumatically operated xylophone controlled by a Programmable Logic Controller (PLC). This report provides insights into the various types of IP rights and their significance in protecting and promoting the commercialisation of this unique musical instrument.

Patent

a PLC-controlled xylophone enhanced with Arduino technology, demonstrates patent-worthy elements such as its innovative design, use of Arduino for music, and unique beater mechanism. This potential for patentability arises from meeting key requirements such as novelty, inventiveness, and industrial applicability.

Regarding patent options, there is a choice between full-term patents lasting 20 years with higher filing fees (€385) and short-term utility models lasting 10 years with lower filing fees (€60.21).

Figure 4 : Patent

Conclusion

Overall, This report investigated the commercialization potential of a novel PLC-controlled xylophone enhanced with Arduino technology. The report argued that this product could significantly benefit students in educational institutions by making STEM learning more engaging and practical.

Several key takeaways emerged for successful commercialization. Firstly, the xylophone addresses a clear market need for more engaging and hands-on learning experiences in STEM education. Secondly, the unique combination of automation, music, pneumatics, and PLC coding sets this xylophone apart from traditional learning tools, creating a strong Unique Selling Proposition (USP). Finally, the report emphasized the importance of intellectual property (IP) protection strategies. Patenting the xylophone's unique design, Arduino integration, and beater mechanism could provide Team 2B with a competitive edge and safeguard their innovation. The report also highlighted the cost benefits of utility models compared to full-term patents.

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