DECISION-MAKING. Comprehensive methodology and circular approach to business decision-making

Summary

The Decision-Making project consists of creating a methodology for implementing and using business intelligence and artificial intelligence tools and knowledge in the commercial field of small companies.

Objectives

• **Increase sales** through digitisation and improved decision-making. Provide tools and information that, through business intelligence techniques, generate knowledge for commercial decision-making.
• **Facilitate decision-making** through automation of knowledge systems extracted from data analysis, allowing the creation of decision patterns that facilitate swift and effective responses when faced with similar situations in the future.
• **Obtain an advantage over the competition**. The time between detecting a business opportunity and executing it and achieving the desired result is key in an increasingly volatile and competitive market. It is no good knowing what to do if you are not able to do it. What really makes the difference is the time it takes to implement actions that have a real impact on the desired results. Having a decision-making tool (Decision-Making) that speeds up this process is one of the main competitive advantages for a company in today's market.
• **Identify key points in decision-making.**
• **Focus business efforts on the points that are important for the company.** Improving productivity quotas and minimising wrong decisions are key factors for business success.
• **Provide people with the skills to interact with data, a highly strategic action.**
• **Implement a disruptive project in the market**. Switching from traditional data analysis to an innovative business opportunity suggestion system.

Description of the actions carried out in the project

1- Data collection.
Reliable historical and recent data on the functioning of commercial activities.
2- Data processing.
Data processing with specialised computer tools (R software and/or Python programming language).
3- Definition of KPIs
Definition of the key performance indicators (KPIs) that will be measured to verify the success of the project and achievement of set objectives.
4- Definition of ROLES.
5- Descriptive analysis of the data.
Descriptive analytics: understanding reality through numerical and graphic data analysis.
6- Predictive analysis of data.
Using the behavioural correlations and patterns obtained to make reliable predictions about trends in variables of interest over time. Developing multivariate regression models to explain the relationships between key efficiency indicators and different decision variables. Using multivariate and machine learning techniques to be implemented in open solutions, R and Python.
7- Prescriptive analysis of the data.
Construction of an intelligent decision support system. Use of intelligent algorithms (heuristics, metaheuristics and artificial intelligence methods) that automatically provide commercial recommendations that maximise the efficiency of the commercial agent in each time period.

8- Pilot test and analysis.
Test of the effectiveness of the developed intelligent support system.
9- Project management and coordination.
10- Dissemination of the results.

Final results and practical recommendations

The Decision-Making project has developed a methodology that enables the implementation and use of business intelligence and artificial intelligence tools and knowledge in the commercial environment of small companies.

The methodology will facilitate the professionalisation and digitisation of the sales department, providing tools, method and rigour to minimise subjective decision-making and provide the necessary knowledge to be able to specify a highly competitive way of doing things.

Specifically, the analyses and the value each one provides are summarised below:

● Customer segmentation provides the cooperative with better knowledge of its customers (their profiles and purchasing behaviour, who brings more value to the company and who brings less, etc.). This information helps focus business efforts on applying personalised marketing and commercial measures to each of these groups.
● The value provided by the recommendation system is increased sales by accurately recommending products that customers might add to the basket, based on other customers' past consumption trends.
● Forecasts provide knowledge of what is likely to happen in the coming months, so the cooperative can optimise stock to minimise breakages and avoid overstocking, thereby providing economic benefits. Marketing campaigns can also be planned in advance for products with a high sales forecast, and improvements considered for products with low sales forecasts.
● Customer notes provide an objective assessment of different customers who have visited the company, thus increasing knowledge on competitive advantage.
● Obtaining alerts means the company does not find out about diversions in sales for a given material several months later. The system warns of products that have deviated from their normal trend in the past month so corrective action can be taken quickly.
● Product segmentation provides the cooperative with more knowledge of its own products, which can be highly advantageous for sales and marketing campaigns.

Conclusions

The following objectives set by the AEI-Agri have been met:

● The project has contributed to the economic, productive and competitive efficiency of the cooperatives, by providing greater knowledge of customers and product sales and providing sales forecasts that facilitate stock optimisation and avoid unnecessary transport of materials. This reduces emissions and is more climate-friendly.

● This analysis system using machine learning and artificial intelligence technologies contributes to a stable and sustainable supply by allowing efforts to be focused on materials with the highest turnover, thus avoiding stockpiling materials with poor sales forecasts, which would end up being rejected.

● We believe that the information now available to cooperatives will enable them to generally improve processes aimed at protecting the environment and adapting to climate change.

● Decision-Making has also created links between leading technologies and people in other areas of expertise, aiming to integrate these technologies into their decision-making processes in an efficient and user-friendly way.

Thus, the value created through the relationship between the research and the parties involved in this project is irrefutable. New technologies have provided efficiency, objective data-driven analysis and innovation to sectors in which it was previously lacking. With improved processes and new information, agribusinesses will be better able to contribute to reducing climate change and proving production efficiency.

Leader of the Operational Group

ORGANISATION: Agrícola Falset-Marçà i Secció de Crèdit, AFALMA, SCCL

Coordinator of the Operational Group

ORGANISATION: Catalan Federation of Agricultural Cooperatives (FCAC)

Other members of the Operational Group (grant recipients)

ORGANISATION: Centre Vinícola del Penedès, SCCL

Other members of the Operational Group (not recipients of the grant)

ORGANISATION: Universitat Oberta de Catalunya (UOC)

Geographical area(s) of application

PROVINCE(S)	REGION(S)
Tarragona	Priorat and Baix Penedès

Dissemination of the project (publications, conferences, multimedia, etc.)

Websites: www.etim.cat; www.cevipe.cat; www.fcac.coop; www.uoc.edu
Publication of news on social media and FCAC Agroactivity, in the UOC press service.
Sending communiqués.
Conference-Webinar.
Social media.

Project website

More information on the project

PROJECT DATES	TOTAL BUDGET
Start date (month-year): July 2020	Total budget: €134,726.80
Completion date (month-year): September 2022	DACC funding: €71,405.20
Current status: Completed	EU funding: €63,321.60
	Own funding: €53,181.63

With funding from:

Project funded through Operation 16.01.01 (Cooperation for Innovation) through the Catalan Rural Development Programme 2014-2022.

Order ARP/133/2017 of 21 June, approving the regulatory bases for grants for cooperation for innovation by promoting the creation of European Association for Innovation operational groups in the areas of agricultural productivity and sustainability and the execution of innovative pilot projects by those groups, and Resolution ARP/1531/2019, of 28 May, announcing the call for the grant.

Generalitat de Catalunya
Departament d'Acció Climàtica, Alimentació i Agenda Rural

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