OINOS: a full customized traceability system for wine production and supply chain logistics

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Due to the introduction of both mandatory and voluntary regulations concerning the quality and traceability of products, wineries need effective and efficient tools for managing the production flow from the grape to the bottle including the logistics for shipping of the goods.

The aim of this study was to implement a database for the management process within a winery that annually produces more than 22 million bottles.

The company Araldica from Castelvero, ISO 9000 and BRC certified since the '90s, intended to replace paper records with a computerized system that would go to overlap the operational procedures and forms already in place without affecting the logic.

For the vinification and bottling phases the goal of the project was to implement a tool able to:

- Planning and organize an on-line production/monitoring system according to the orders; the application should directly transfer the information on production cycles;
- Manage the design of the production process in all its steps;
- Assign tasks to employees specifying the operations to be performed and to record the operations carried out directly online by the operators;
- Keep track of every step and turn of each addition and the relative batch of the product used;
- Identify the operator who has carried out the operation;
- Be able to trace back and trace every stage of the production cycle;
- Identify the state of the wine in terms of the tank, processing stage and the respective analytical framework.

The main problems in the design phase have emerged in the difficulty in rationalizing the countless variations to the production cycles while maintaining a simple and intuitive interface.

For the logistics aspect, the warehouse has been computerized through the use of passive RFID label bind to the pallet until the end of the production line and the provision of RFID readers and PC on board the trucks and fork lifts.

The information is transferred between the devices through a WIFI network.

The system allows:

- To load the warehouse at the time of production of the product from the bottling line;
- To know the spatial location of the goods;
- The verification of the consistency between the goods delivered and the order fulfillment.

In this way the stock at the warehouse is kept constantly updated and errors were significantly reduced in the process of ventilation and shipping.

In the warehouse logistics, the rapid exchange of information between the devices not slowing down the flow of goods with carts was the most critical point of the system.

In the future we intend to extend the potential of software allowing customers to the introduction of the orders directly through a web page, checking the status of the goods and the transmission of information of goods shipped to be acquired by the customer together with the reading of RFID.