






# “Accounting and control in the system of marketing and logistics support for Ukrainian wineries”

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# ACCOUNTING AND CONTROL IN THE SYSTEM OF MARKETING AND LOGISTICS SUPPORT FOR UKRAINIAN WINERIES

## Abstract

Effective winery management requires the systematic integration of accounting data, logistics information, and digital marketing elements. The paper explores conceptual approaches to integrating the accounting and control systems with marketing and logistics processes in Ukraine's winemaking industry within the context of digital transformation. Based on the results of the software market analysis, the advantages and limitations of various types of software (ERP, CRM, QR marking, RFID, etc.) for Ukrainian wineries are summarized. Critical factors for the successful implementation of digital technologies have been identified, such as technological readiness of an enterprise, availability of qualified personnel, financial capacity, and adaptability of systems to Ukrainian market conditions. The functional significance of organoleptic control in the system of internal quality monitoring is determined, specifically in identifying signs of counterfeiting and ensuring product compliance with established standards. The study proposes a logical and functional model of synergy of digital accounting, marketing, and logistics, enabling strategic control based on real-time data. It also presents IT solution implementation scenarios adapted to the scale of a winery's operations, its digital maturity, and business priorities. The study results have practical significance for enhancing management decisions, optimizing quality control, improving the efficiency of sales channels, and fostering consumer trust in the brand.

## Keywords

accounting, control, wineries, marketing, ecotourism,  
logistics, ERP systems, CRM systems

## JEL Classification

F14, M11, O12

## INTRODUCTION

In today's conditions of winery operation, there is an objective need for an integrated approach to organizing an accounting and control system that covers not only traditional production and financial processes but also marketing strategies, logistics solutions, and digital tracking tools.

Growing competition, the development of ecotourism, and increasing requirements for the quality and transparency of products delivered to consumers require wineries to implement innovative management solutions. In this context, ERP (Enterprise Resource Planning) and CRM (Customer Relationship Management) systems play a key role, allowing the integration of accounting, control, and analytics within a single information environment.

QR-marking and RFID-tracking technologies provide additional value in this system, allowing the implementation of the principle of product traceability "from vine to glass." The close interaction between marketing, logistics, information technology, and accounting functions is shaping a new paradigm of control at wineries, where data becomes the basis for managing quality, demand, brand, and consumer trust.

This study aims to form a conceptual approach to the integration of accounting, control, marketing, and logistics components at a winery by studying various systems and digital technologies for tracking products during their sale (using the example of Ukraine).

## 1. THEORETICAL BASIS

The Ukrainian wine industry, which has historically been an important component of the Ukrainian agri-food chain, is currently undergoing a profound transformation, influenced by both long-term structural changes and the immediate devastating consequences of the full-scale war. As of 2024, the total area of productive vineyards has decreased to approximately 15 thousand hectares (Table 1), which is the lowest figure since the country gained independence. Moreover, in 2023, the number of operating enterprises engaged in the cultivation of grapes (Classifier of Types of Economic Activity (KVED) 01.21) and the production of grape wines (KVED 11.02) was 108 and 62, respectively (State Statistics Service of Ukraine, 2025).

**Table 1.** Vineyard area in Ukraine in 2010–2024, thousand hectares

Source: State Statistics Service of Ukraine (2025).

Year	Vineyard area, thousand hectares	
	General	In the fruitful age
2010	87.0	67.6
2011	84.1	69.1
2012	77.6	67.9
2013	50.9	45.8
2014	48.7	44.2
2015	45.4	41.8
2016	45.1	42.7
2017	43.5	41.3
2018	43.0	40.7
2019	41.8	39.5
2020	39.1	37.2
2021	36.6	34.7
2022	30.2	29.0
2023	27.5	26.3
2024	15.2	14.4

*Note:* Since 2014, the data have been provided excluding the temporarily occupied territory of the Autonomous Republic of Crimea, the city of Sevastopol, and part of the temporarily occupied territories in Donetsk and Luhansk regions; since 2022, the data have been provided excluding territories temporarily occupied by the Russian Federation and parts of territories where military operations are (were) being conducted.

The war has caused significant damage to the industry: about 50% of vineyard areas ended up in combat zones, occupation zones, or under

threat of mining. According to the report of the Ukrvinprom Association (2023), about 585 hectares of vineyards were destroyed in the Dnieper region. Material and technical assets were also damaged – production facilities, warehouses with finished products, and infrastructure facilities were destroyed (especially in the Kherson, Mykolaiv, Zaporizhzhia, and partly Odesa regions).

Logistics chains were also destabilized: shortages of containers, caps, and components due to the shutdown of domestic production and difficulties with imports led to an increase in production costs and complicated export operations (Bezhenar, 2024).

Despite this, wine exports in 2022–2024 show a growth trend, both in physical volumes and in sales geography, which is associated with the strengthening of the Ukrainian wine brand in international markets (the “Wines of Ukraine” initiative) and the adaptation of producers to new conditions (Bezhenar, 2025).

One of the key responses to the war challenges was the reorientation of a number of producers to western Ukraine, the development of the craft segment, and the active implementation of digital management and traceability technologies. In the context of labor shortages, declining access to infrastructure, and growing demands for accounting transparency, in particular for international reporting and donor aid, the role of digital ERP and CRM systems has increased significantly (Turchyniak et al., 2024). Emphasizing the importance of social aspects, it is worth mentioning that (Kolot et al., 2020) studied the development of the institution of decent work as an imperative of social quality, which has important lessons for Ukraine, particularly in the context of adapting to new conditions in the labor market.

The development of the wine industry and its enterprises has been studied by many scientists, including Shymanovska-Dianych et al. (2024), who studied how the functioning of enterprises affects

the country's economic development and the filling of state and local budgets. Therefore, the issue of the functioning of Ukrainian wineries in wartime is relevant, and the search for directions for their further development through the analysis of challenges and risks, as well as the development of proposals for improving business processes for distribution and sales of products, is of paramount importance.

Marketing and logistical support for enterprise activities has always been a relevant and important component of the successful functioning of enterprises in the global world. However, modern reality requires enterprises and organizations not only to maintain high quality of products and services, but also to adapt to various challenges arising as a result of digital transformations (Lyfar et al., 2023).

In today's world, the eco-friendliness of production is becoming crucial, as it affects not only the state of the environment but also people's health and the future of the planet. Companies are increasingly implementing 'green' technologies, striving to reduce harmful emissions, use resources efficiently, and meet the expectations of conscious consumers. Touil et al. (2023) analyze the defining factors for 'greener' supply chains, while Fuad et al. (2025) explore improvements in sustainability in SMEs through "green" HRM and supply chains. Rianawati et al. (2024) investigated the strengthening of Indonesia's 'blue' economy sector through innovation and competitive advantages. AlSheikh (2025) examines the ecological transformation in Hungary's automotive sector, highlighting the importance of environmental aspects across various industries. Lyfar et al. (2023) investigated the implementation of logistics practices and digital marketing platforms in manufacturing enterprises in Ukraine and showed how environmental standards influence the optimization of supply chains. Pererva (2022) analyzed the features of the digital transformation of marketing communications in the context of martial law, in particular the evolution of online sales channels and interaction with customers. Fedorenko (2011) lays the theoretical foundations for the connection between the environmental orientation of business and logistics, showing the advantages of resource efficiency and delivery time. Tiazhkun (2024) outlined trends in the digital transformation of logistics in the agro-

industrial sector, with an emphasis on the automation of warehouse processes and transportation. Abbasov and Gurbazade (2025) conducted a bibliometric analysis of research trends regarding sustainable development in the agri-food industry and its impact on food security. Steiner et al. (2024) examined the transparency of sustainability disclosure in value chain management within the agri-food sector.

Marushko and Volianyk (2015) investigated the use of modern accounting information systems in an enterprise and assessed the state of use of modern accounting information systems and the need to implement corporate information systems in enterprises. Skrynnyk and Lyeonov (2022) investigated new trends and key areas of research in information technology for financial control and accounting at both the state and corporate levels. Additionally, the transformation of the audit market in Ukraine, discussed in the study by Makarenko et al. (2021), highlights the importance of adapting to new requirements for financial control and reporting in changing conditions.

The introduction of ERP (Enterprise Resource Planning) and artificial intelligence technology has revolutionized the accounting industry, as it has been of great importance in reducing costs and using resources efficiently. Srbinoska et al. (2023) note that the greatest benefits in the accounting sector are achieved through quality reporting, management decision-making, and more efficient use of resources through increased efficiency and reduced processing time.

Voitovych and Tereshchuk (2021) focused on the use of big data for personalized communications in the B2C sector. Shtal et al. (2018) systematized digital marketing tools in the context of small and medium-sized businesses. Hrynevych et al. (2024) investigated the synergy between e-commerce, automated CRM platforms, and the impact of artificial intelligence on the marketing solution structure. Mashilo et al. (2025) examined the impact of hedonic motivation for shopping on impulsive behavior in online purchases.

Benko (2011), Kovpaka et al. (2022), and Butenko (2011) identified enterprise marketing policy general principles in transformational conditions of

the economy, focusing on systematic planning, assortment policy, and strategic management of distribution channels.

The problem of alcohol safety occupies a special place in the context of the wine industry. Its consideration in the works of Jernigan and Ross (2020) allows us to compare international experience in the formation of quality control policies and alcohol labeling; Havrylyshyn and Sapozhnyk (2024) focus on the Ukrainian context, pointing out the problems of state regulation of the wine market in the context of hybrid aggression and an unstable legal environment.

Many scientists emphasize the need to integrate accounting into a single information system. Currently, the types of business accounting are changing significantly, and their interpenetration and merging are observed. The blurring of boundaries between them is also facilitated by new economic conditions and the use of modern information technologies by business entities (Shypunova & Yelnikova, 2011). In addition, as the business world faces new trends and challenges, such as globalization, war, world crisis, climate change, global political instability, intense market demands, fierce competition, and disruptive technologies, even more difficulties arise in managing technological, economic, and social processes (Pukalska, 2023).

Ravikumar et al. (2022) note that the decision to purchase wine depends on many factors from the consumers' side. Information about consumer preferences, seasonal demand, popularity of certain wine varieties, or packaging solutions is the basis for making management decisions that require integration with accounting and control systems.

Improving the brand image and increasing the competitiveness of wine products on the Ukrainian market is possible through the introduction of a modern system of product accounting and traceability. Having a clear traceability mechanism (e.g., through labelling, QR codes, or an electronic batch tracking system) increases consumer confidence as it allows them to verify the origin and quality of the wine. In addition, this promotes regulatory compliance,

reduces product counterfeiting risks, and improves a manufacturer's reputation as reliable and responsible.

The current stage of development of Ukraine's wine industry is characterized by the parallel impact of a deep crisis and adaptation strategies that form the prerequisites for digital transformation, structural renewal, and rethinking of management models. The theoretical framework of the study is based on a combination of approaches to cost accounting, logistics, and marketing in the context of an unstable agricultural sector environment, taking into account military risks and the needs of long-term recovery.

## 2. RESULTS AND DISCUSSION

The modern system of product accounting and tracking has its own functional and technological features. To determine the most appropriate accounting support with advanced control functions for Ukrainian wineries, Table 2 provides a comparative description and grouping of product tracking systems according to a number of key characteristics. These characteristics include the type of system, tracking of bottles or batches of products, integration with QR and RFID technologies, the ability to control implementation by region, the availability of support in Ukraine, the cost of implementation, the availability of a web resource, positive and negative aspects, as well as accounting and control functionality.

The use of ERP (Enterprise Resource Planning) or CRM (Customer Relationship Management) systems combined with QR labeling or RFID tracking allows for more efficient management of production and logistics processes at wineries. CRM systems allow you to record customer interactions, keep sales history, create personalized offers, and forecast demand, which directly affects logistics and production planning.

These systems have a Traceability function and will allow you to:

- track the production of each batch of wine (including bottling date, grape variety, tanks, etc.);

**Table 2.** Comparative characteristics of product tracking systems for wineries in Ukraine

System	Type	Bottle/ Batch Tracking	QR / RFID integration	Control by region	Support in Ukraine	Price/ implementation	Website	Pros	Cons	Accounting capabilities	Control capabilities
1	2	3	4	5	6	7	8	9	10	11	12
IT Enterprise	ERP for the food industry	Yes	QR / RFID	Yes	Yes	High	<a href="http://it-enterprise.com">it-enterprise.com</a>	Full automation of production, recipe accounting, change planning, reports on variable balances of raw materials and semi-finished products	Complexity of implementation; requires time and resources for adaptation	Accounting for production, recipes, variable raw material balances, and production planning by shifts	Detailed shift reports, balance control, and production planning
Wine Suite	CRM and marketing for winemaking	Yes	QR	Yes	Partial	Medium	<a href="http://wine-suite.com">wine-suite.com</a>	Integration with wine tourism, direct and online sales, data collection, and digital marketing	Limited capacity for complex manufacturing, more focus on marketing and sales	Wine tourism management, direct and online sales, marketing, CRM	Customer data collection, sales analytics, marketing campaigns
BAS ERP	ERP	Yes	QR (possible)	Yes	Yes	Medium	<a href="http://bas-soft.eu">bas-soft.eu</a>	Ukrainian software; supports tax requirements, adapted for production	The interface is complicated for beginners; a specialist is needed	Strong accounting, composition, parties, pricing	Monitoring of batches, balances, sales, and regional distributions
Odoo ERP	ERP (modular)	Yes	QR / RFID	Yes	Partial	Low/Medium	<a href="http://odoo.com">odoo.com</a>	Open software, flexibility, good interface, multilingual	Technical specialist required for setup, less localization for Ukraine	Production, batches, inventory, analytics, CRM	Visual dashboards, distribution channel control, and individual reports by region
SAP Business One	ERP (high level)	Yes	QR / RFID	Yes	Through partners	High	<a href="http://sap.com">sap.com</a>	Powerful system, world leader, deep control	High cost, complexity of implementation	Full product lifecycle, deep analytics, finance, logistics	Control by region, retail, wholesale, channels, and points of sale

**Table 2 (cont.).** Comparative characteristics of product tracking systems for wineries in Ukraine

System	Type	Bottle/ Batch Tracking	QR / RFID integration	Control by region	Support in Ukraine	Price/ implementation	Website	Pros	Cons	Accounting capabilities	Control capabilities
1	2	3	4	5	6	7	8	9	10	11	12
MoySklad	Cloud CRM + accounting	Yes (batches)	QR	Yes (analytics)	Yes	Available / by subscription	<a href="http://moysklad.ua">moysklad.ua</a>	Simplicity, online access, and a mobile app	Limited customization options for complex production processes	Goods, batches, warehouses, customers, sales	Simple dashboards, sales analytics, and integration with marketplaces
Bitrix24 + CRM composition	CRM + accounting	Limited (no batches)	QR (through modules)	Yes	Yes	Available / subscription	<a href="http://bitrix24.ua">bitrix24.ua</a>	Website integration, marketing, and customer communications	Not suitable for complex production	Customer management, sales, and basic logistics	Customer control, reports by regions, managers
Microsoft Dynamics 365 Sales	ERP/CRM; B2B/B2C sales	No, but it is possible through custom solutions	Power Platform, QR/ RFID	Yes (geoanalytics)	Yes	High (license and implementation)	<a href="https://learn.microsoft.com">https://learn.microsoft.com</a>	Flexible CRM system, deep integration with Microsoft 365, Power BI, Teams, Outlook, powerful analytics, process automation, sales forecasting	Not intended for joint production or product tracking, limited support for Ukrainian localization	Customer records, interaction history, revenue forecasting, does not maintain accounting or inventory records directly. With product accounting – through Supply Chain Management integration or third-party solutions	Monitoring of managers' activities, sales efficiency, setting KPIs, automatic sending of notifications, control by regions, markets, and product types (through customization)

- record a unique barcode or QR code of the bottle;
- control shipments – when, where, and how much was sold by distributors or sellers; and
- see the sales map in real time (by region, type of product).

ERP and CRM systems are the most widely used tools that allow you to automate a key part of business processes: customer relationships and enterprise resource planning (Kovpaka et al., 2022). However, there is a significant difference between them (Table 3).

These systems are different in functionality, and the ideal would be a combination of both systems, since ERP is responsible for wine production, accounting and delivery, production control, bottle balances and logistics, and CRM is responsible for sales, communication with customers, demand analytics and helps to sell, maintain communication with restaurants, stores and wholesale buyers.

Logistics covers not only the physical movement of products, but also the accompanying information support. It is important for wineries to ensure control over the storage, transportation, and delivery of wine products, observing the temperature regime, safety, and delivery times.

ERP systems allow you to integrate data from logistics processes into an enterprise's overall accounting system, ensuring supply chain transparency and accurate balance control. They also allow for centralized accounting of production, warehouse, finance, logistics, and sales, including accounting for marketing costs. CRM modules, in turn, are

focused on supporting customer relationships and also include sales analytics and accounting for response to marketing campaigns.

The integration of these systems allows for the formation of end-to-end data chains, from raw materials to the end consumer, which strengthens the internal control function and minimizes the risks of counterfeiting (Figure 1).

Returning to Table 2, another option to consider is QR or RFID integration. A QR code (Quick Response) is a square barcode that is easily read by a phone camera or scanner. RFID (Radio Frequency Identification) is a tag with a chip that transmits data via radio waves, so it can be read by special devices without touching (through a box or bottle).

A comparison of QR marking and RFID tracking is presented in Table 4.

Among modern digital tools used in winemaking, identification and traceability technologies occupy a significant place, in particular QR codes and RFID tags. QR coding allows for quick access to the attributes of a batch of products – the origin of raw materials, bottling dates, storage conditions, etc., which contributes to the transparency of accounting and the formation of reliable reporting.

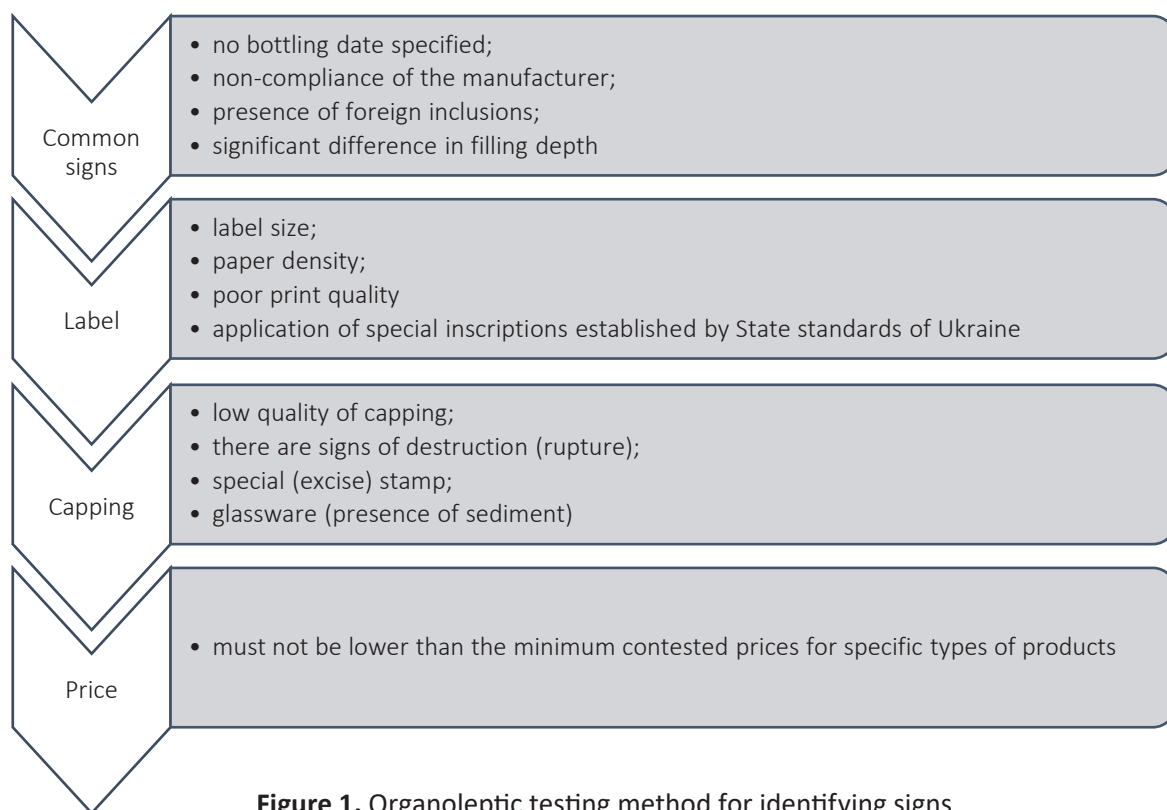
At the same time, RFID technologies provide continuous control over the movement of containers in production and logistics channels, integrating with ERP system modules for inventory management and product movement control.

In the context of digital transformation, logistics and marketing act as interconnected management

**Table 3.** Comparative characteristics of ERP and CRM systems when used in winemaking

Criteria	ERP	CRM
Purpose	Resource management	Customer relationship management
Functions	Accounting for raw materials and supplies; Production management; Warehouse accounting; Logistics; Financial accounting (income, expenses, wages) Cost price, calculation; Integration with accounting and tax reporting	Customer and contact database; Sales history; Sales funnel; Communication with clients (calls, letters); Marketing (mailings, promotions); Customer support (service)
Focus	Internal processes (production, accounting, finance)	External processes (sales, customers, marketing)
Users	Manufacturers, accountants, logisticians, managers	Sales managers, marketers, support
Data	Order, composition, finances, cost price	Customers, deals, sales channels, communications

Source: Developed based on Havrylyshyn et al. (2024) and DSTU 4518-2008. (2008).



**Figure 1.** Organoleptic testing method for identifying signs of counterfeit and falsified products

**Table 4.** Comparative characteristics of QR marking and RFID tracking in winemaking

Parameters	QR marking	RFID tracking
Scope of use	Unique QR code for each bottle; When scanning, information is displayed (wine name, bottling date, batch, region of production)	RFID tag on each bottle or box; During transportation, storage, or sale, the RFID reader automatically records the movement of goods; The entire bottle history is stored in the system
Scanning	Camera/manual	Automatically
Visibility	Must be visible	Can be hidden
Suitability	For small and medium-sized wineries	For large warehouses, logistics centers
Pros	Cheap to implement; Easy to use; Works with regular phones	Fast and automatic reading without manual scanning; Ideal for warehouses and large volumes
Cons	–	More expensive (tags + readers) More difficult to implement

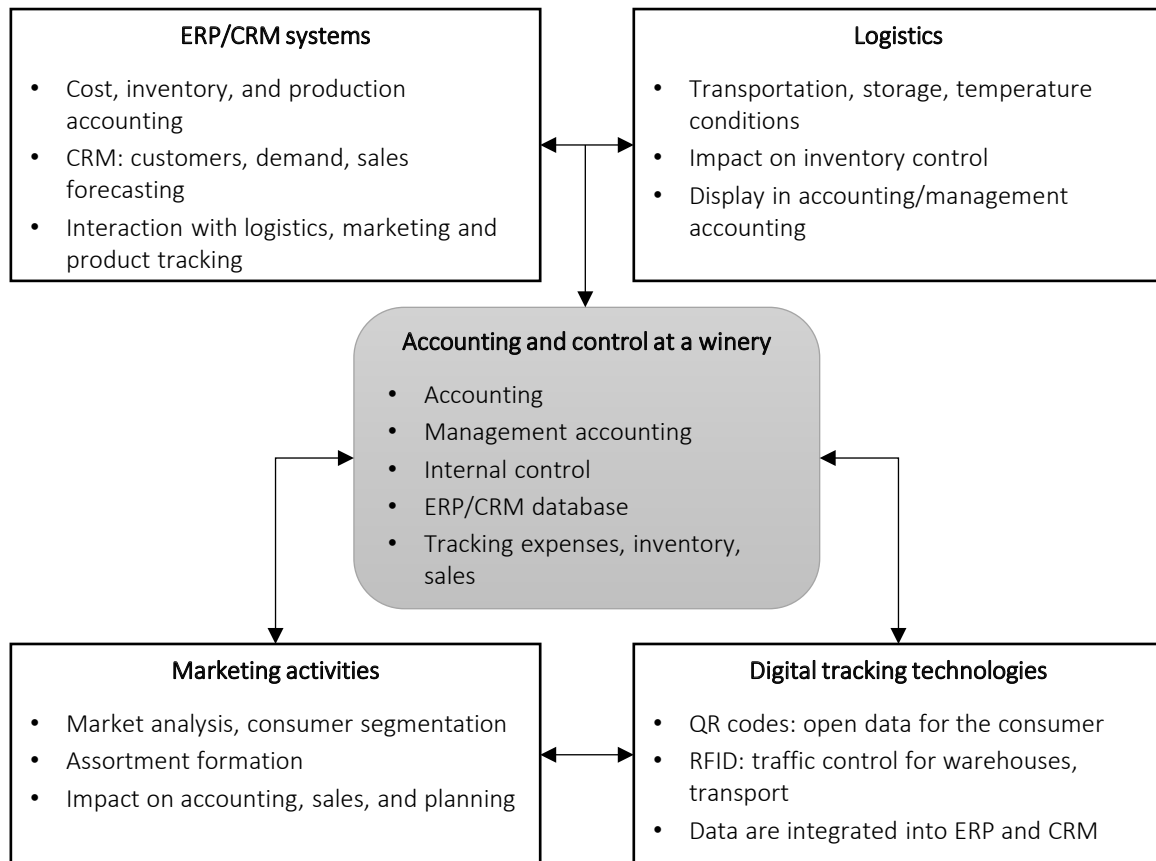
subsystems, the combination of which allows the enterprise not only to optimize supply chains but also to increase the efficiency of interaction with the market, adapting the assortment and communication channels to changing consumer priorities (Fedorenko, 2021).

Figure 2 presents the synergy of digital accounting, marketing, and logistics as a strategic control tool.

Figure 2 shows that the synergy of digital accounting, marketing, and logistics forms the

basis for building an effective strategic control system at a winery. However, the practical implementation of such a model directly depends on the scale of production, the level of digital maturity of the enterprise, and its market orientations.

In this context, it is advisable to analyze possible scenarios for implementing specialized IT solutions for accounting, control, and marketing support, adapted to the needs of small, medium, and large wine businesses.



**Figure 2.** Synergy of digital accounting, marketing, and logistics as a tool for strategic control

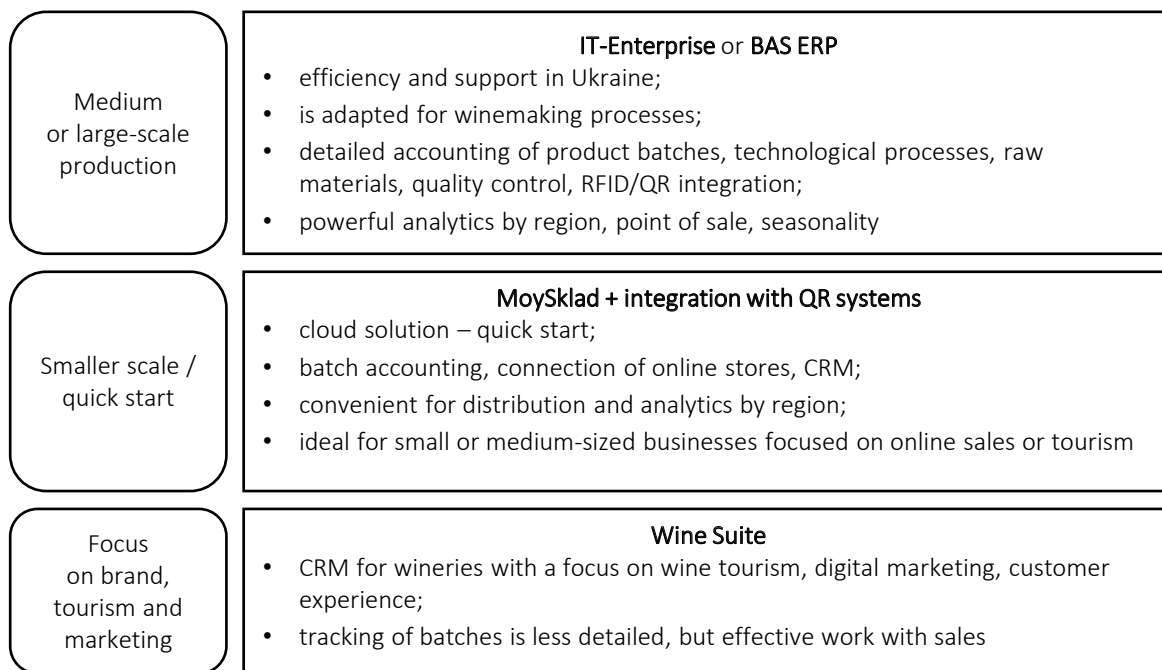
Having studied all the systems for tracking manufactured products and their characteristics, it should be noted that to correctly select and implement one of them, a winemaking enterprise needs to take into account the scale of production, its organizational structure, areas of activity, in particular, the presence of export operations, provision of wine tourism services, etc., and budgetary capabilities. Based on modern solutions and the needs of wineries in Ukraine, the following is proposed (see Figure 3).

Figure 3 presents three main scenarios for implementing digital solutions in the accounting and control system of wineries, differentiated by production scale, automation level, and strategic focus. In addition, before initiating changes in structure, business processes, culture, and technology, an organization must clearly define what results it expects from forming loyal customer relationships. Such a strategy could be a competitive advantage through targeting the largest customers or through increasing sales

volumes through the most profitable distribution channels (Butenko, 2011).

The first scenario is focused on medium and large-scale enterprises and involves using comprehensive ERP solutions (in particular, IT-Enterprise or BAS ERP), which provide a high level of adaptation to the specifics of winemaking. Such systems support detailed batch accounting, process management, product quality control, integration with RFID/QR tools, as well as advanced analytics capabilities regarding sales, regional sales structure, and seasonality.

The second scenario is intended for small and medium businesses that require a quick launch of an accounting system. In this case, it is proposed to use the MoySkklad cloud service with the integration of QR systems; this allows you to organize batch accounting, connect CRM modules, and integrate online stores. This approach is convenient for businesses focused on distribution, online sales, or wine tourism.



**Figure 3.** Scenarios for implementing digital solutions in the accounting and control system of the wine business

The third scenario involves a marketing focus on the brand, wine tourism, and customer experience. It is based on the use of solutions such as Wine Suite, which, although having a simplified batch accounting function, effectively provide CRM functionality, loyalty program management, interaction with winery visitors, and digital support for marketing campaigns.

In general, the presented classification of scenarios shows that the choice of IT solutions should be made taking into account an enterprise’s strategic goals, system flexibility, the need for detailed accounting, the depth of integration with sales channels and marketing activities.

A comparative assessment of the results of this study with previous theoretical and applied works confirms the need for an integrated approach to managing the digital transformation of a winery.

Havrylyshyn (2024) examines the tools for quality control of alcoholic beverages in the face of the risk of counterfeiting and emphasizes the importance of comprehensive product identification. However, the article expands on this idea by including traceability tools such as QR/RFID technologies and ERP/CRM systems that provide end-to-end accounting.

Casini et al. (2014) proposed a management accounting model for the viticulture sector, focusing on production costs. At the same time, the current study proposes to supplement this model with elements of strategic control, such as product traceability technologies, which allows combining cost management with quality control and product movement.

Singh et al. (2024) use the example of an Indian winery to highlight the practice of accounting for financial transactions. The article complements this experience with digital processes – integrated inventory control, marketing analytics, and traceability systems – that form a more comprehensive approach to management.

Accordingly, the existing criteria described in the article complemented the management accounting approaches in the wine industry by Casini et al. (2014), expanding the theoretical base by including digital traceability technologies by Havrylyshyn (2024) and a practical case of integrating ERP/CRM with accounting systems using the example of an Indian enterprise (Singh et al., 2024). A step has also been taken towards developing information and management models adapted to today’s industry and technological challenges.

The current study allowed us to identify the structural feasibility of integrating digital tools, in particular ERP/CRM solutions and traceability technologies (QR/RFID), into the winery management system. The obtained results partially correlate with existing scientific approaches, but significantly complement the industry specifics of digital transformation.

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## CONCLUSION

The study aimed to describe a conceptual approach to integrating accounting, control, marketing, and logistics components into the activities of a winery, taking into account the possibilities of digital product tracking technologies. To achieve this, the functional properties of modern ERP and CRM systems, as well as traceability tools, in particular QR marking and RFID technologies, were analyzed.

The results of the study showed that the combination of digital accounting solutions with product flow control tools provides end-to-end monitoring of production and sales processes, from the moment of manufacture to the end consumer. This integration allows us not only to increase the transparency of accounting but also to quickly respond to changes in demand, implement targeted marketing strategies, prevent losses and fraud, strengthen the accounting control function, and generate reliable management and financial reporting.

It is concluded that combining the accounting and control function with marketing and logistics support opens up new opportunities for adaptive management of the product range, distribution, customer experience, and brand. The proposed approaches can be used as a methodological basis for selecting digital solutions according to the scale of the winery and its digital maturity. Further research should be aimed at creating standard models of digital transformation for enterprises of various formats, as well as assessing the economic efficiency of introducing complex IT systems into Ukrainian production practice.

## AUTHOR CONTRIBUTIONS

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