

Digital trends applied to the vine and wine sector

A comprehensive report on the digitalisation of the sector

OIV Digital Transformation Observatory Hub

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Head of Statistics & Chief Digital
Transformation Officer



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- 01. Digital Transformation Plan
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Digital Transformation Plan



01



The OIV is a scientific and technical reference organisation in the vine and wine sector created in 1924

Objectives



Inform its Member States of measures concerning producers, consumers and other players in the vine and wine sector



Assist other international organisations, specially those which carry out standardisation activities



Contribute to the **international harmonisation of existing practices and standards**, improving the conditions for producing and marketing vine and wine products, and helping ensure that the interests of the consumers are taken into account

Functions(*)



Standards for the vitivinicultural sector

Creation of internationally harmonised and accepted standards for the production of vitivinicultural produce



Research and publications

The OIV works alongside an international network of experts to contribute to innovation and advances in the vitivinicultural sector on certain subjects which are considered to be the forefront of the sector



Databases, statistics and sector information

The OIV works with Member States gathering data and producing statistical outlooks, and generating analytical reports on specific topics in the vitivinicultural sector



Education and communication

The OIV offers research grants, patronage, literature rewards and an immersive Master Degree management level program in the wine sector

(*) These functions rely on four units



Viticulture



Enology



Economics and Law



Health and safety

+800

 Experts

Independent professionals of the sector that contributes to the research and publications

48

 Member States

countries responsible most of the production and consumption of wine in the world

16

 Observers

non-Member States, organisations, regions or territories



In the Strategic Plan 2020–2024, the OIV has established as one of its key axis: “Facilitation of the digital transition of the sector”



AXIS I – Promote **environmentally-friendly** vitiviniculture



AXIS II – Promote **economic activity** according to principles of sustainable development and of market growth and globalisation



AXIS III – Contribute to **social development** through vitiviniculture



AXIS IV – Pursue the development of a **harmonised regulatory environment**



AXIS V – Facilitate the **digital transition** of the sector



AXIS VI – Consolidate the role of the **OIV** as a benchmark of scientific, technical and cultural organisation worldwide



AXIS V – Facilitate the **digital transition** of the sector

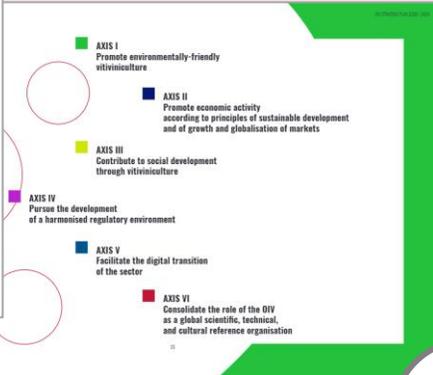
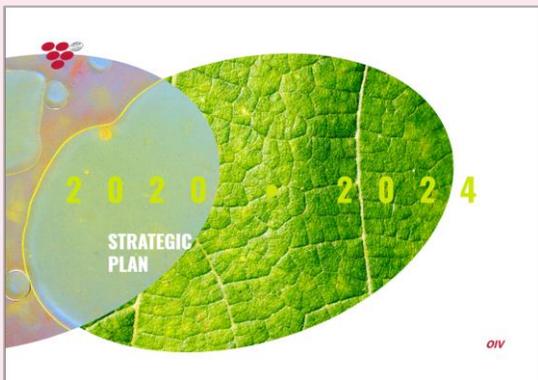


A

Support sector digitalisation

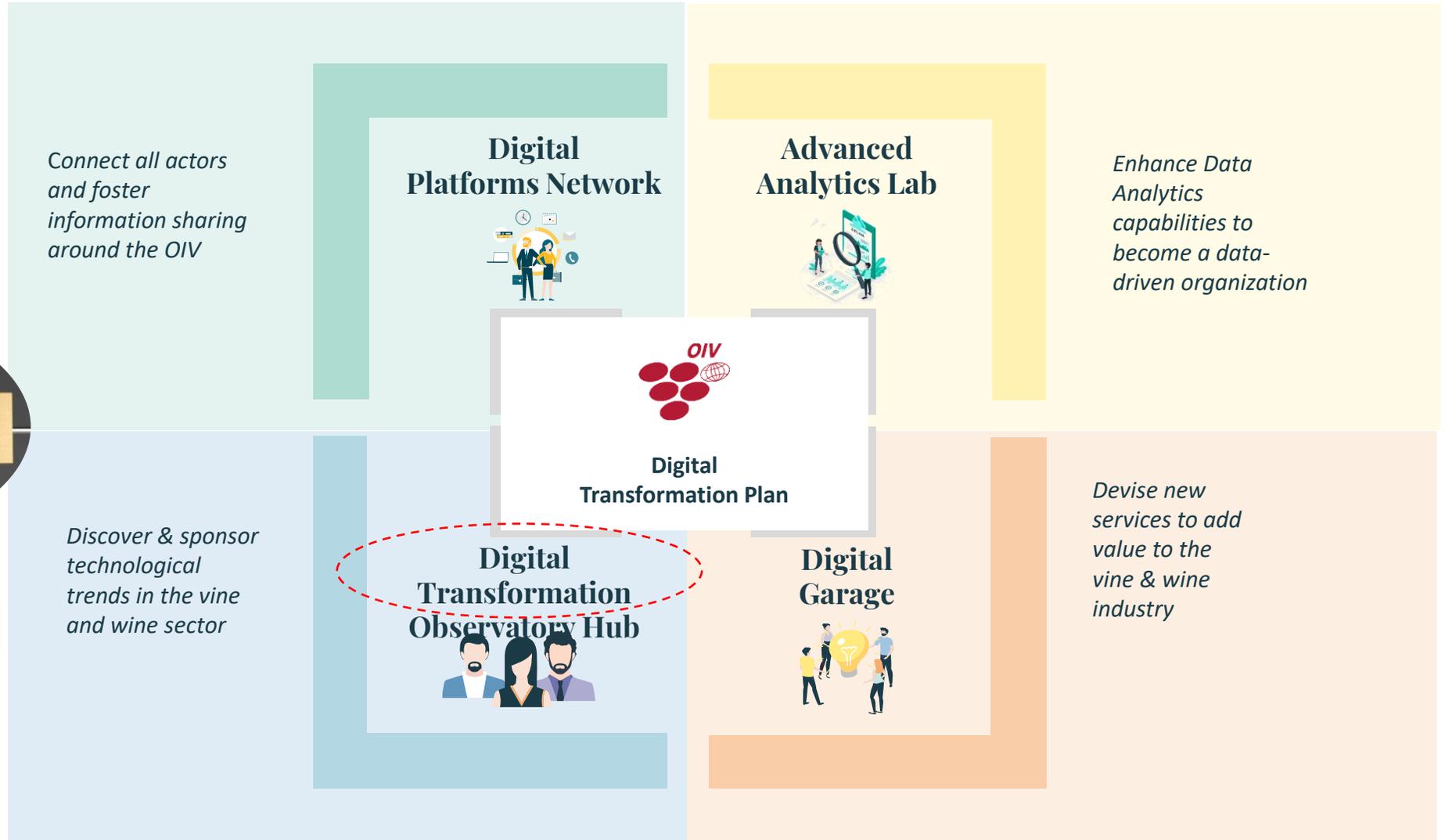
B

Fully utilise the digital space





This has been materialised in a Digital Transformation Plan with 4 main initiatives





The Digital Transformation Observatory Hub aims to enhance information, promotion and dissemination of digital practices and innovations in the sector



Digital Transformation Observatory Hub – Report



02

A comprehensive study on the digitalisation of the vine and wine sector has been developed based on a Member States' Survey and on Experts' Interviews

Member States' Survey

-  **18 countries**
-  **8 questions**
-  **Impact, maturity degree, stages of value chain, public initiatives, ...**

 **21 experts interviewed**



Experts' Interviews



Internet of Things (IoT)



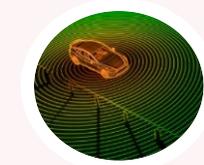
Artificial Intelligence (IA)



Robotics



Satellite Imagery



LiDAR



Blockchain



E-Label



E-Certificate



Smart-Storing

Other content included in the report



Smart vineyards



Sustainability

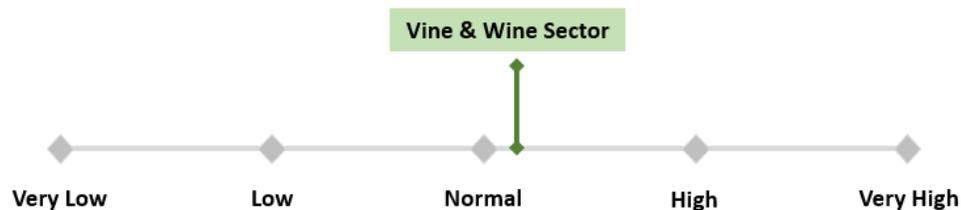
Survey to Member States



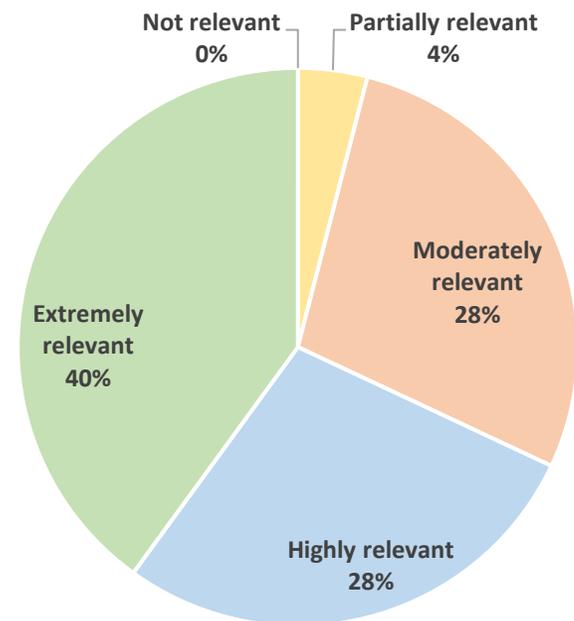


It seems like the vine and wine sector is average in terms of adoption of digital technologies and its impact is seen as extremely relevant for the next 5-10 years

1 In comparison with the other agro sectors (coffee, cocoa, olive oil, among others), what is the current extent of adoption of digital technologies in the vine and wine sector?



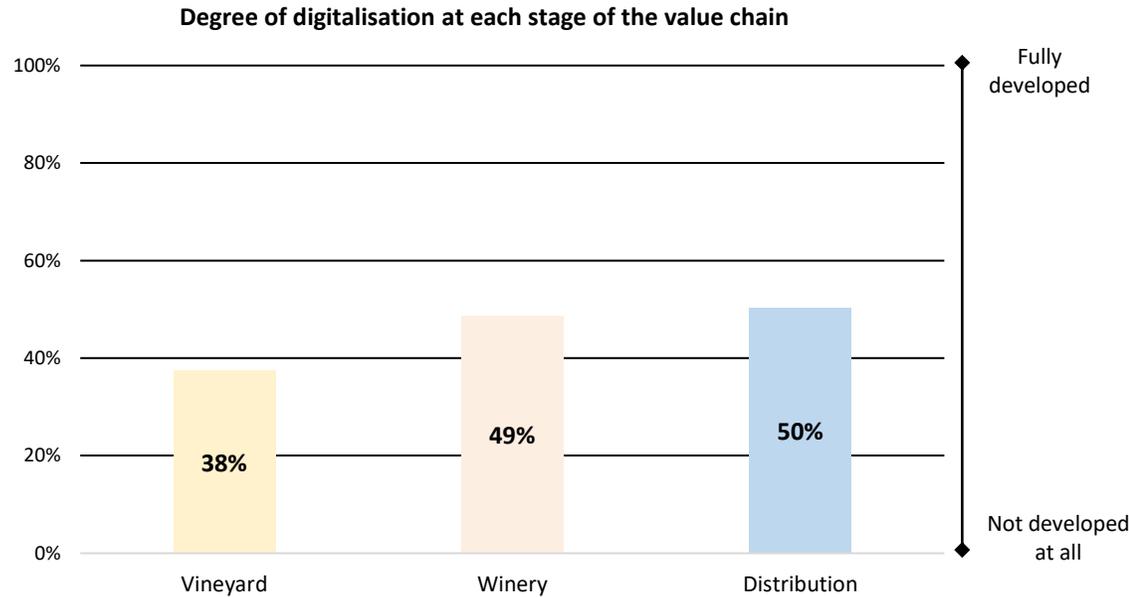
2 How significant do you think the impact of digitalisation will be in the next 5-10 years in the vine and wine sector?



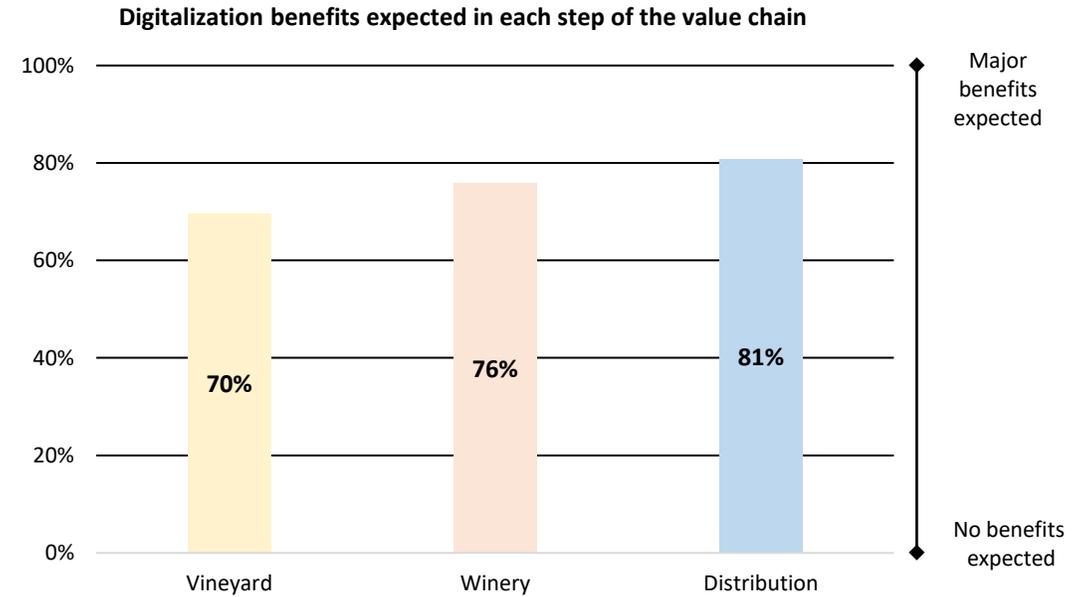


The most digitalised stage of the value chain is distribution and it is also where major benefits are expected in the near future

3 Currently in your country, how digitalised is the vine and wine sector in each stage of the value chain?



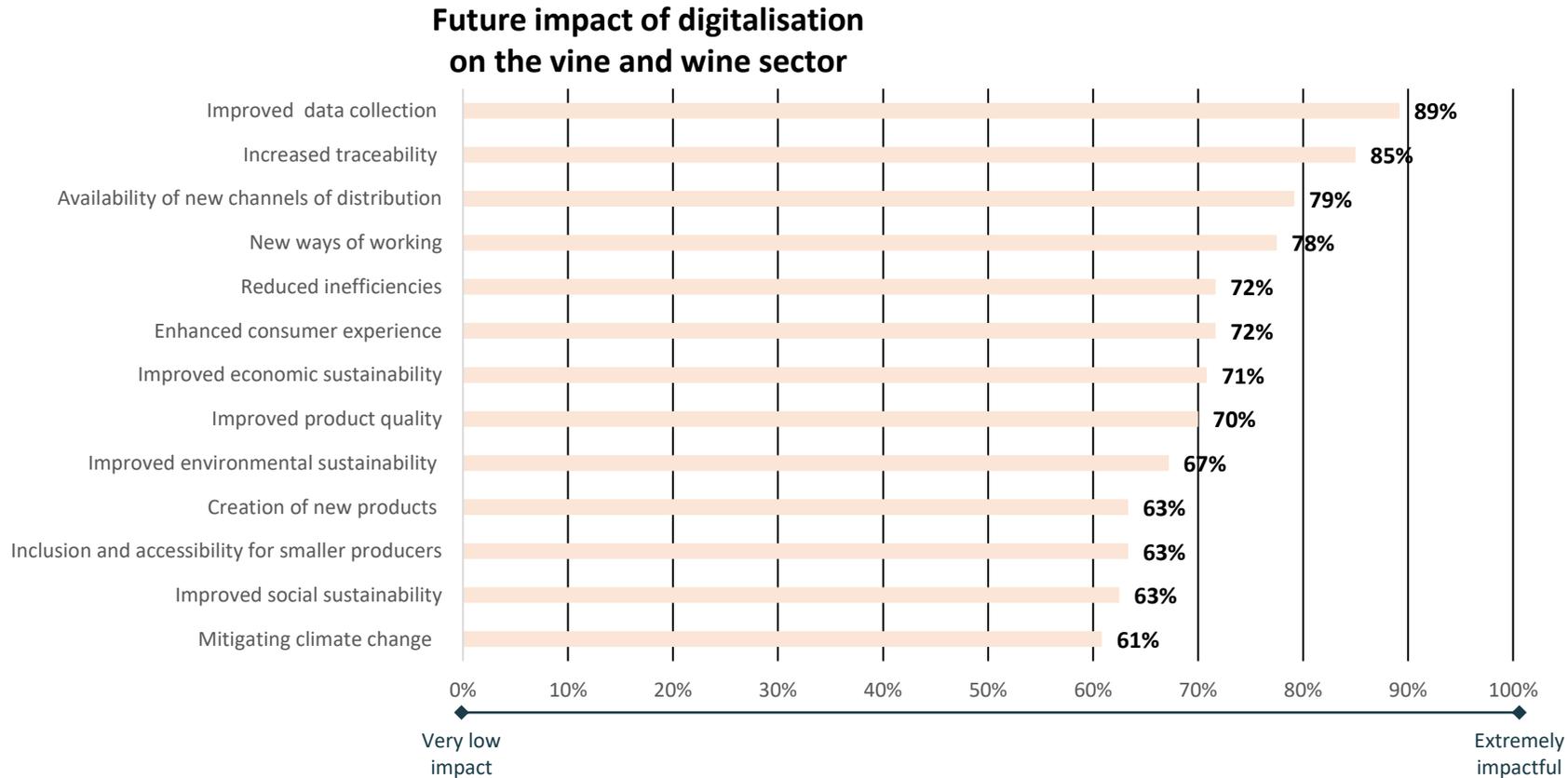
4 To what extent can each step of the value chain benefit from digitalisation in the next 5 to 10 years?





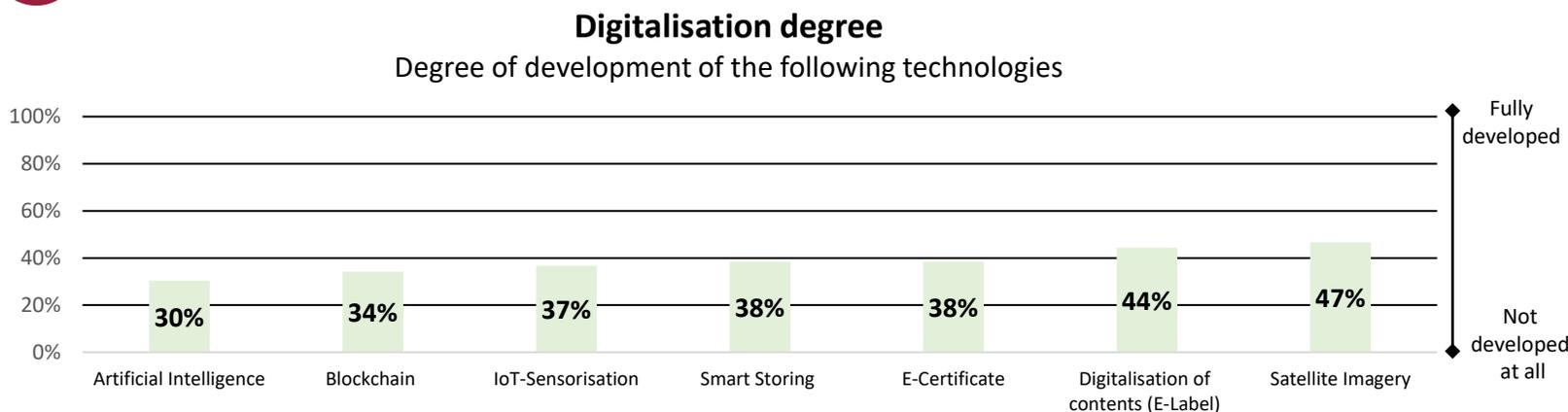
Improved data collection and increased traceability are the two main fields that will be impacted the most by digitalisation

5 What fields will be impacted by digitalisation of the vine and wine sector the most?

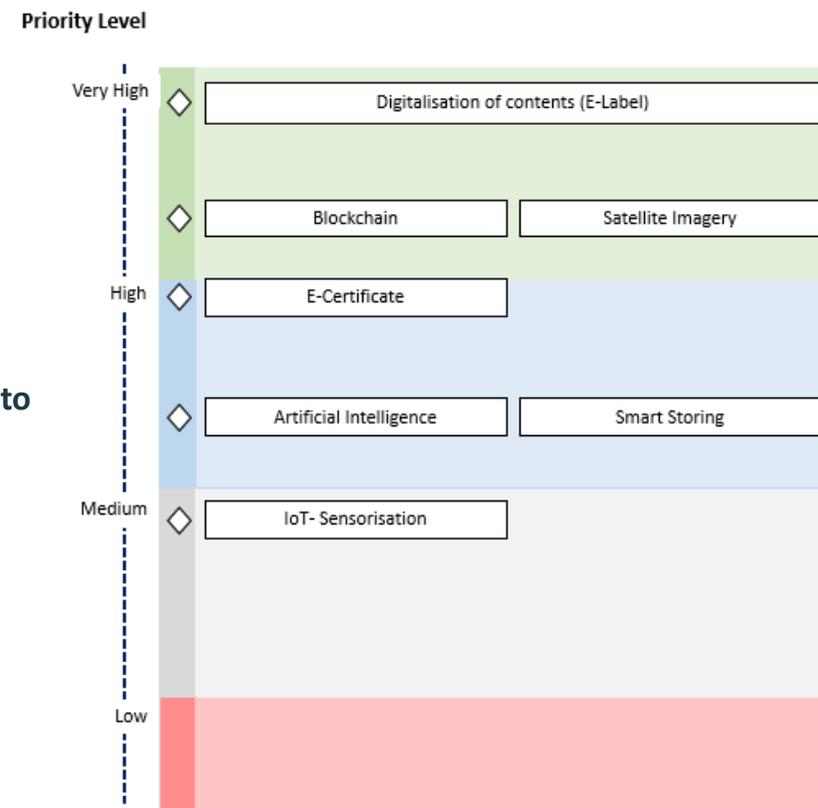


The technologies that are more developed are the ones with more public support and considered a high priority

6 What is the degree of development of the following technologies in your country's vine and wine sector?

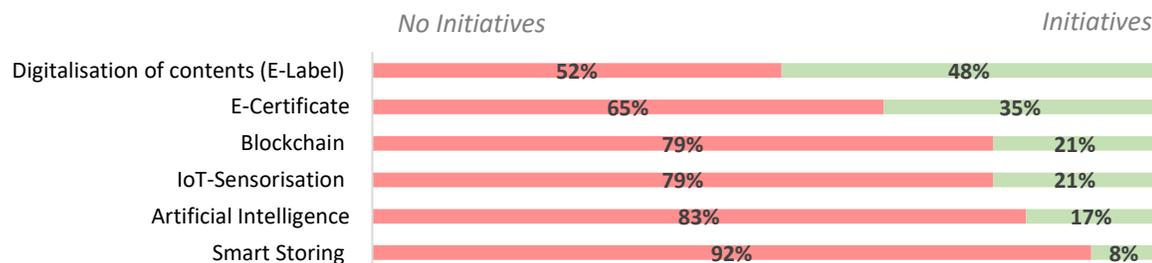


8 Which of these technologies should be prioritised for the digital transformation of your country's vine and wine sector?



7 Are there any public initiatives (schemes/support programmes/policies) currently in place in your country to promote the following digital tools in the vine and wine sector?

Existence of current public initiatives to promote the following digital tools in the vine and wine sector



Experts' Interviews





Internet of Things (IoT) / Sensorization

Technologies

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IoT describes **the network of physical objects** (things) that incorporate sensors, softwares and other technologies in order to **connect and exchange data** with other devices or systems **over the Internet**



Monitor soil and water conditions



Weather forecasting



Temperature



Mr. Daniel Seseña
 Head of Industry 4.0 –
 Minsait
 (Spain)



Wineries will continue to maintain their classic appearance (tradition), but they will implicitly integrate digitalisation, incorporating advanced sensory and analytical elements that will enhance control of the quality and efficiency of the entire wine process

Daniel Seseña

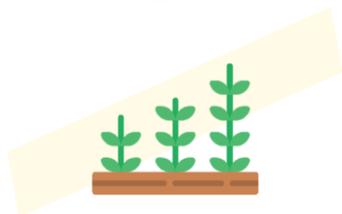


Artificial Intelligence (AI)

Technologies

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AI is a branch of **computer science** concerned with building **smart machines** capable of performing **tasks that typically require human intelligence**



Crop monitoring and management



Production and quality process monitoring



Wine reviews processing and recommendations



Dr. Karly Burch
Research Fellow –
University of Otago (New Zealand)



Dr. Bernard Chen
Professor –
University of Central Arkansas (USA)



Mr. José Luis Flórez
AI Leader –
Minsait (Spain)



Mr. Ganesh Padmanabhan
Founder –
Stories in AI (USA)



We now have the tools and the infrastructure to codify human knowledge and intelligence into non-living things with software and that is what AI is all about –

Ganesh Padmanabhan



Robotics

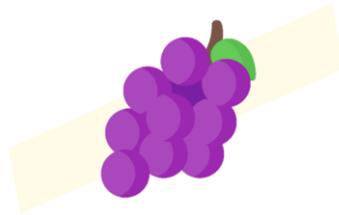
Technologies

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A robot is a machine controlled by a computer that is used to perform jobs automatically, assisting humans or replicating human actions



Assisted / Automatic seeding



Assisted / Automatic fertilising and harvesting



Inventory control and movement



Mr. Albert Strever
Senior Lecturer – Stellenbosch University (South Africa)



With the latest advancements and improved energy efficiency as well as lowered cost in recent years, it is believed that in the next three to five years these systems will become more viable and will have a far greater impact on the vine and wine sector - Albert Strever



Satellite Imagery / Geographic Information Systems (GIS)

Technologies

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Satellite imagery are **images taken by satellites** which can be used for a wide range of purposes such as **cartography, geo-positioning, studying climate change, geographic surveys** and other purposes



State of the vineyards, diseases, ripeness...



Thermal / infrared images for accurate information



Predictive models together with AI and IoT



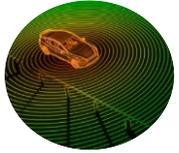
Mr. Benjamin Bois
Assistant Professor – University of Bourgogne (France)



Mr. Julian Chamboleyron
President – Gisworking (Argentina)



Digital cartography, together with robotics, drones and GNSS (global navigation satellite systems such as GPS and Galileo) time and space precision improvement have opened a new era for viticulture – Benjamin Bois



Laser Imaging Detection and Ranging (LIDAR)

Technologies

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LiDAR is a **remote sensing method** that can be used to **map the structure of vegetation in a region**, including height, density and other characteristics. This tool allows the study of **characteristics of a particular area in detail**



Mr. Alexandre Bastard
Head of RD&I – EtOH (France)



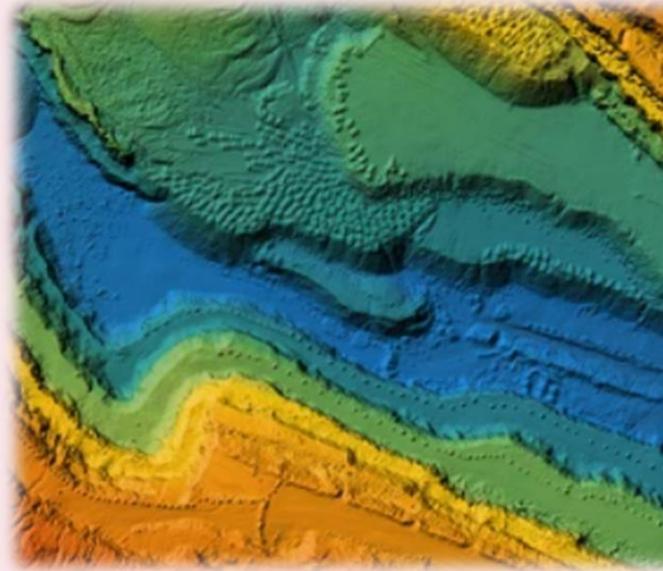
Map the vineyard in three-dimensions (3D)



Site specific spraying (pesticide precision)



Reduction of accidents in the vineyard



With LiDAR, agricultural robotics takes a step forward. Thanks to its precision, this technology allows robots to better locate themselves and interact with any environment such as vineyards – Alexandre Bastard



Blockchain

Technologies

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Blockchain is a **chain of blocks** that contain **encrypted information** sent in the form of data transactions **on the network**. It is based on **Distributed-Ledger Technology (DLT)** so it does **not necessarily require a third party** to certify the information



Traceability with full digital identity



Smart Contracts (SC)



Non Fungible Tokenisation (NFT)



The technology will breakthrough in the next five years and there will be much more engagement or the same as in the early days of the internet. I see we are at the tip of the iceberg and that in the next five years significant scaling of this technology in the wine industry will take place– Oliver Oram



Dr. Javier Ibáñez
Chaired Professor –
Comillas Pontifical
University (Spain)



Mr. Oliver Oram
CEO –
Chainvine
(UK)





E-Label

Technologies

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Electronic labelling is a way for manufacturers to **provide a greater amount of information**. Compliance information is **created electronically** and **displayed on a screen**



Mr. Fabian Torres
Business Development –
SICPA
(Spain)



Improved transparency



Security against fraud



Increased traceability



Thanks to the implementation of E-Label producers can include more information in their bottles, including media content, and this has helped to increase transparency for consumers – Fabian Torres





E-Certificate

Technologies

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An electronic certificate is a set of data that enables: (i) the **identification of the holder of the certificate**, (ii) a **secure exchange of information** with other parties and (iii) the **electronic signing** of data sent in a way as to allow **verification on integrity/origin**



Improved certificate integrity and security



Time reduction issuing certificates



Environmentally-friendly



Electronic certificates already play a prominent role in facilitating international trade. Wines must follow this innovation – Glauco Bertoldo



Mr. Glauco Bertoldo
Federal Inspector –
Ministry of Agriculture
(Brazil)





Smart Storing

Technologies

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Smart warehouses aim to **provide efficiency to logistics**, helping companies **reduce costs and increase product** input and output cycles



Increased fluidity in logistics processes



Efficiency in order preparation



Improved safety for employees and goods



The main objectives that companies seek with the robotisation of warehouses is increased efficiency, which means a reduction in costs and greater accuracy in the delivery of products to the customer – Sergi Almar



Mr. Sergi Almar
Partner – Minsait (Spain)





Smart vineyards



Sustainability



Mr. Antonio Graça
R&D Director –
Sogrape



Mr. Adriaan Oelofse
RD&I Manager –
Winetech



Mr. Mario de la Fuente
Manager –
Wine Technology
Platform (PTV)



Mr. Nacho Rivera
CEO –
The Overview Effect



Ms. Adela Conchado
Environmental Missions –
The Overview Effect

Smart vineyards is an agronomic concept that defines the management of agricultural plots based on observation, measurement and action under situations of environmental variability

Technologies:



Navigation Satellite Systems (GNSS)



Drones



Sensors



Satellite Imagery

Benefits:



Aid informed decision marking



Establish early warning / detection systems



Provide suitable tools for climate change readiness



Improve sustainable and profitable crop production

Challenges for the vine and wine sector concerning digitalisation:



Regenerative agriculture



Maximum use of biological production



Product eco-design and marketing model



Life cycle optimisation (facilities, machinery, ...)



Water cycle (collection, use and regeneration)



Energy consumption and renewable supply

Looking ahead



03

The vine and wine sector has entered into a new era of digitalisation, which offers numerous opportunities to take advantage of, but also significant challenges

Opportunities



Efficiency



Productivity



Transparency



New business models



Sustainability

Challenges



High implementation costs



Lack of public support / initiatives



Low commitment of end-users



Lack of international standards



Unawareness



**International Organisation
of Vine and Wine**
Intergovernmental Organisation