



INNOVATION AND SUSTAINABILITY IN AGROTECH:

CASE STUDIES AND RESEARCH PROJECTS



WHO WE ARE

Lifely is a company that develops innovative solutions for environmental sustainability and precision agriculture, using advanced technologies such as IoT sensors and artificial intelligence. **It focuses on precision agriculture, sustainable water management, animal welfare and optimisation of agri-food supply chains.** Its main projects include crop monitoring using sensors and drones, water management in agriculture, innovation in viticulture and product traceability.

Lifely aims **to reduce environmental impact** and **improve resource efficiency by promoting sustainable agricultural practices** with a strong focus on technological innovation.



AGROTECH: DIGITAL TRANSFORMATION

Agriculture, thanks to the adoption of advanced technologies, is facing a very important transformation that ranges from **digitalization to robotics**, from **IoT sensors to artificial intelligence (AI)**.

These advances are necessary to meet growing global demand for food, in a context of limited natural resources and climate challenges.

MAIN BENEFITS OF AGROTECH

- **Optimization** of natural resources.
- **Reduction** of waste
- **Improved** quality and traceability
- **Sustainability** and reduced environmental impact
- **Increased productivity**
- **Reduced** ecological impact
- **Respect** for consumer needs



APPLICATION AREAS OF THE PROJECTS

Below are the key sectors in which Lively projects are inserted, each of which brings advanced solutions and new perspectives for the future.



Agri-Tech and Precision Farming

Using advanced technologies, such as IoT sensors, drones, satellites and AI-based predictive models, to optimize plant cultivation.



Digital Livestock Farming and Animal Welfare

Improving farm management, animal health and productivity, through the use of sensors, behavior analysis and digital technologies.



Viticulture Supply Chain

Precision technologies and production traceability to improve wine quality and optimize resources.



Water Management and Environmental Sustainability

Monitoring optimal management of water resources, reducing waste and improving crop productivity.



Agri-food and Cereal Supply Chains

Optimizing cultivation practices, supply chain management and improving product quality, using precision technologies.

REFERENCE SECTOR:

AGRI-TECH AND PRECISION FARMING

ADVANCED TECHNOLOGIES FOR SMART, SUSTAINABLE AND HIGH-YIELD CROPS.



WHAT WE DO

We combine artificial intelligence, IoT sensors and advanced data analytics to revolutionize the way we grow: more efficiency, less waste, better results.

KEY TECHNOLOGIES

- **AI & MACHINE LEARNING:**
Prediction and data analysis
- **IoT SENSORS:**
Microclimate and VOC monitoring
- **DRONES AND SATELLITES:**
Biomass and crop analysis
- **CLOUD PLATFORMS & DSS:**
Automated decisions and integration

BENEFITS AND IMPACT

- **ENVIRONMENTAL SUSTAINABILITY:**
Reduction of pesticides, optimization of resources.
- **INCREASED PRODUCTIVITY:**
Better yield and quality of the crop.
- **AUTOMATION & INTELLIGENT DECISIONS:**
Less human input, more efficiency.
- **TERRITORIAL INNOVATION:**
New skills, collaboration between entities.
- **ECONOMIC EFFICIENCY:**
Reduction of operating costs, growth of the Agri-Tech sector

OUR PROJECTS:

GRAN.AI e GAINS

Optimizing wheat cultivation with AI, DSS and integrated data.

FOCUS: grano duro.

OBJECTIVES: automation, performance, sustainability.

VOCATION e NOSES

Prediction of grapevine and tomato infections by VOC.

FOCUS: Grapevine and tomato.

OBIETTIVI: early diagnosis, reduction of pesticides, innovative predictive models.

PROJECTS: VOCATION & NOSES

Low-cost "matrix" IoT sensors
for monitoring VOCs with greater reliability and accuracy.



Machine Learning, AI and Predictive Mathematical Model
for the classification of target VOCs and the dynamic adaptation of predictive models.



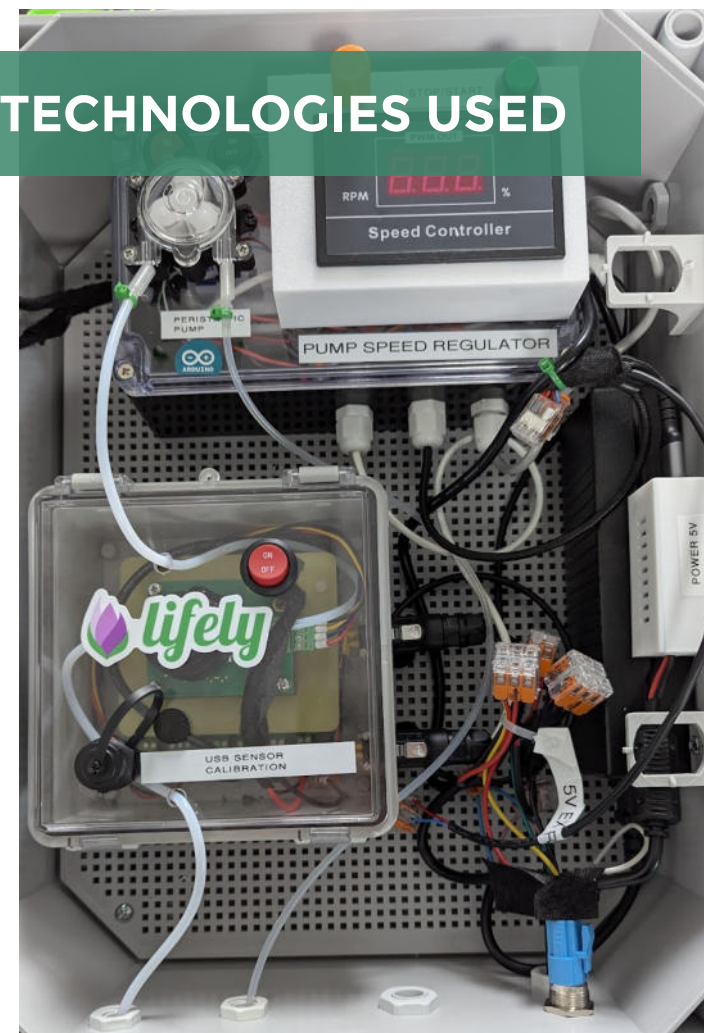
Image recognition and plant phenotyping techniques
to identify the molecules responsible for the disease.



Cloud platform and web-service API
which allows the integration of DSS with other precision agriculture platforms.



TECHNOLOGIES USED



REFERENCE SECTOR:

DIGITAL LIVESTOCK FARMING AND ANIMAL WELFARE

SMART TECHNOLOGIES FOR MORE SUSTAINABLE, PRODUCTIVE AND HUMANE FARMING.



WHAT WE DO

We digitize sheep farm management to improve productivity, quality and sustainability. We combine advanced technologies such as **GPS, AI, satellite imagery and digital platforms** to bring innovation even to the most isolated rural areas.

KEY TECHNOLOGIES

- GPS COLLARS & MULTISPECTRAL SATELLITES:**
For real-time monitoring of animals and pastures.
- AI & MACHINE LEARNING:**
Predictive algorithms to optimize livestock yields and health.
- GIS AND SPATIAL ANALYSIS:**
Intelligent mapping of territorial resources.
- DIGITAL PLATFORMS AND APP:**
Data collection and management for more informed decisions.

BENEFITS AND IMPACT

- ENVIRONMENTAL SUSTAINABILITY:**
Efficient use of resources and responsible agricultural practices.
- INCREASED PRODUCTIVITY:**
Better pasture management and more accurate yield forecasts.
- GREATER INNOVATION:**
Smart solutions for new breeding models.
- GREATER PROFITABILITY:**
Valorization of milk, meat and sheep wool.

OUR PROJECTS:

OVILAT and TEAMA

Revolutionizing sheep farming management, with a special focus on rural and marginal areas.

FOCUS: sheep.

OBJECTIVES:

- A. Digitalize companies with the APPàre platform.
- C. Monitor animals and fodder in real time.
- E. Improve the yield and quality of sheep products.
- G. Strengthen competitiveness and reduce rural abandonment.

REFERENCE SECTOR:

DIGITAL LIVESTOCK FARMING AND ANIMAL WELFARE

SMART TECHNOLOGIES FOR MORE SUSTAINABLE, PRODUCTIVE AND HUMANE FARMING.



WHAT CAN THE DATA COLLECTED BY THE GPS COLLAR FOR SHEEP BE DONE?

MONITORING SPATIAL BEHAVIOR:

- Precise tracking of movements over time
- Study of routes, frequented areas and land use patterns
- Analysis of environmental preferences (e.g. altitude, exposure, humidity)

CONTEXTUAL ENVIRONMENTAL ANALYSIS:

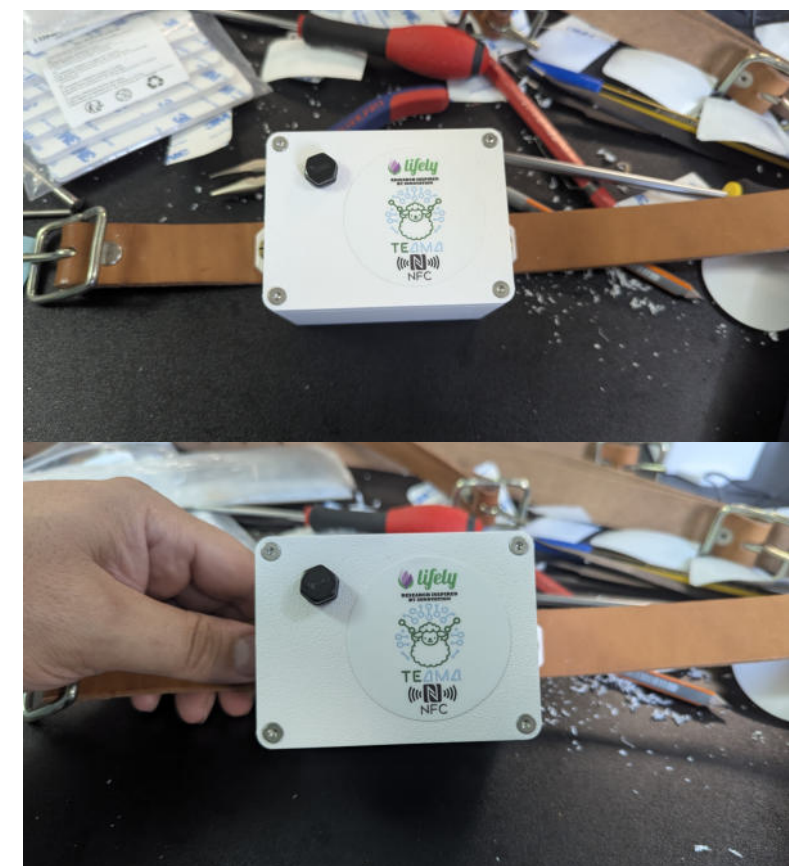
- Association between location and local microclimatic conditions
- Study of how the animal adapts its behavior to environmental conditions
- Identification of refuges, thermoregulation zones or climatic stress

ANIMAL HEALTH AND WELFARE ASSESSMENT:

- Monitoring daily activity and movement patterns
- Detection of anomalies (e.g. prolonged stasis → possible injury, childbirth or death)
- Indirect verification of physiological status based on position and climate

OPTIMIZATION OF MANAGEMENT AND CONSERVATION:

- Decision support in the management of wildlife or extensive livestock
- Planning of targeted interventions (e.g. positioning of watering troughs or fences)
- Monitoring of the effects of reintroduction or protection projects



REFERENCE SECTOR:

VITICULTURE SUPPLY CHAIN

PREDICTIVE TECHNOLOGIES AND TRACEABILITY FOR A HEALTHIER, MORE SUSTAINABLE AND COMPETITIVE VITICULTURE.



WHAT WE DO

We fight threats to vines, such as Flavescence Dorée, using **AI, IoT, sensors, drones and intelligent DSS**.

We help winemakers make more informed decisions, reducing the use of pesticides and improving wine quality.

KEY TECHNOLOGIES

- **IOT NETWORKS & AGRO-METEOROLOGICAL SENSORS:**
Continuous environmental sensing in the field.
- **AI AND E-ADAPTIVE PREDICTIVE MODELS:**
Scaphoideus titanus vector spread forecast.
- **COPERNICUS DRONES AND SATELLITES:**
Spectral analysis of the vineyard and vegetative health.
- **COLLABORATIVE DSS PLATFORM:**
Digital support for winemakers, agronomists and public decision makers.

BENEFITS AND IMPACT

- **ENVIRONMENTAL SUSTAINABILITY:**
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OUR PROJECTS:

FLAV.IA

Prediction, control and targeted treatment against one of the most serious diseases of Italian viticulture.

FOCUS: Grapevine.

OBJECTIVES:

- A. Predicting and mapping the evolution of the vector Scaphoideus titanus
- C. Integrating data from satellites, sensors, history and real time in a single platform
- E. Providing a useful, simple and integrable Decision Support System
- G. Reducing the use of insecticides in favor of a more sustainable agriculture

REFERENCE SECTOR:

WATER MANAGEMENT AND ENVIRONMENTAL SUSTAINABILITY

SMART TECHNOLOGIES FOR MORE EFFICIENT AND RESOURCE-FRIENDLY AGRICULTURE.



OUR PROJECTS:

SPRITZ, ACUADORI & ACUANEXT

FOCUS: Water management.

OBJECTIVES:

- A. **Optimize the use of water and energy:** intelligent systems that reduce waste and increase efficiency.
- B. **Monitor water needs in real time** with biosensors and environmental sensors.
- C. **Adopt advanced irrigation techniques** such as controlled deficit, to ensure quality and sustainability.
- D. **Promote sustainable agricultural practices** through modular, connected and low-impact tools.

WHAT WE DO

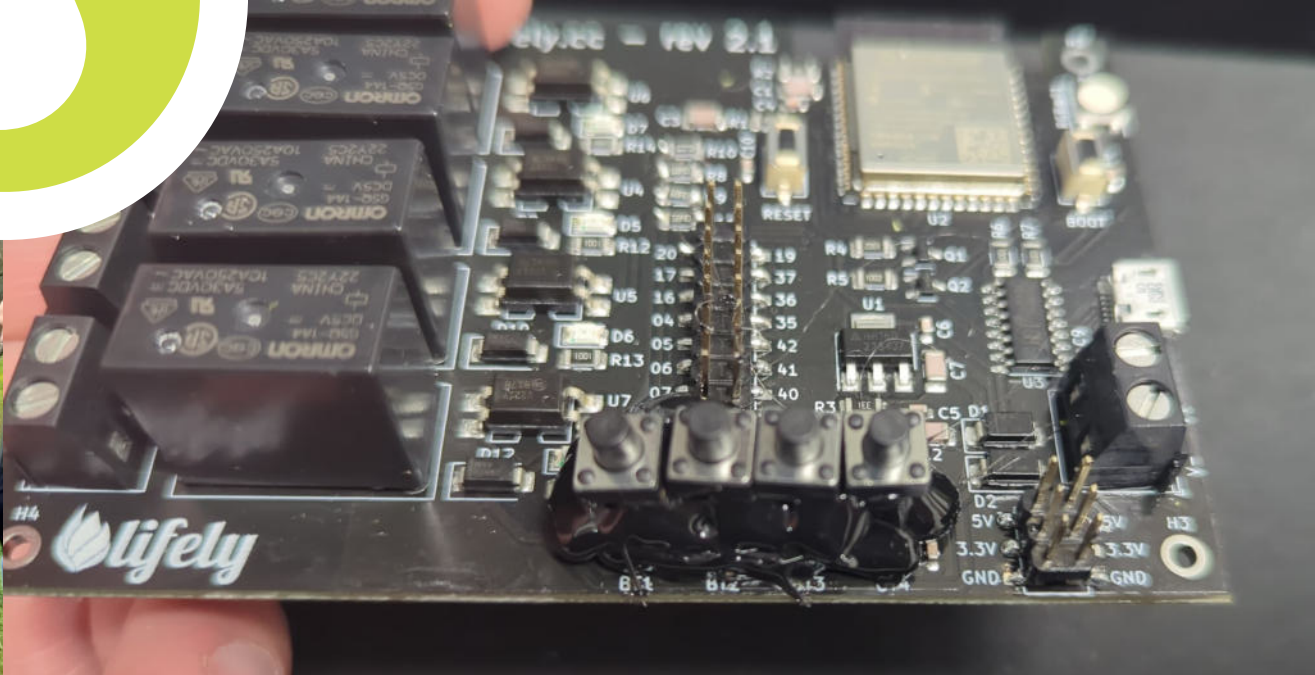
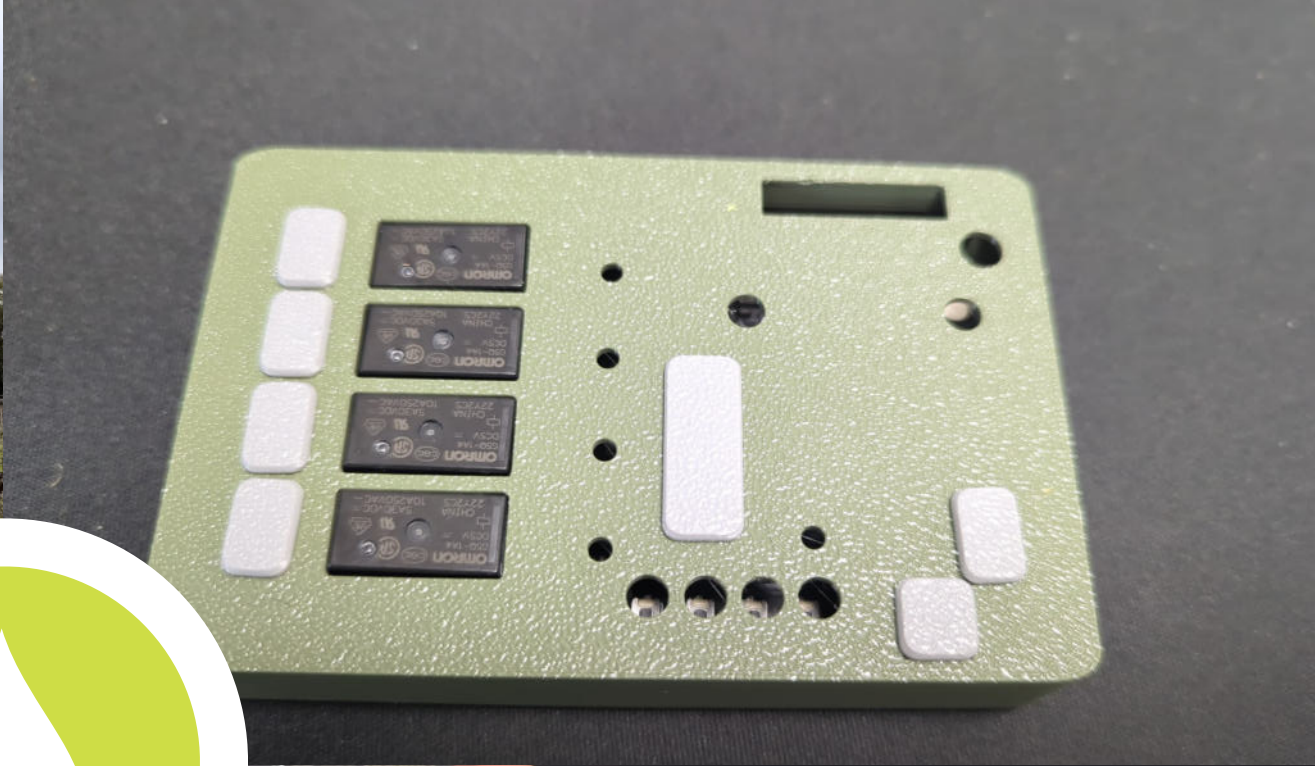
We develop advanced technological solutions for **intelligent irrigation management** and more resilient, **sustainable and efficient agriculture**.

KEY TECHNOLOGIES

- **WIRELESS AND ENVIRONMENTAL IOT SENSORS:**
They detect temperature, humidity, solar radiation and water status in real time.
- **INTELLIGENT CLOUD PLATFORMS:**
They process agronomic data, support decisions and automate irrigation strategies.
- **LCA MODELS AND ENVIRONMENTAL ASSESSMENT:**
To analyze and reduce the overall ecological impact.
- **INTELLIGENT MODULAR CONTROL UNIT (SPRITZ):**
It integrates sensors and adaptively manages irrigation.
- **BIOSENSORS APPLIED TO PLANTS (ACUANEXT):**
They directly measure physiological water potential.

BENEFITS AND IMPACT

- **HYDRO-ENERGY EFFICIENCY:**
Optimized consumption thanks to dynamic and predictive control.
- **AGRONOMICAL INNOVATION**
Introduction of biosensors and advanced irrigation models, with direct impact on production quality.
- **ENVIRONMENTAL SUSTAINABILITY**
Reduction of CO₂, protection of biodiversity and responsible use of natural resources.
- **ECONOMIC SUSTAINABILITY**
Lower operating costs, higher yields and tools accessible also for agricultural SMEs.



REFERENCE SECTOR:

AGRI-FOOD AND CEREAL SUPPLY CHAINS

OPTIMIZATION OF CULTIVATION PRACTICES, SUPPLY CHAIN MANAGEMENT AND PRODUCT QUALITY.



WHAT WE DO

We use digital technologies to make agri-food chains more transparent, sustainable and close to the territory. We guarantee product traceability, enhance local excellence and support supply chain actors in optimizing practices and resources, creating a direct bridge between producers and consumers.

KEY TECHNOLOGIES

- **QR CODE & DIGITAL PLATFORMS**
Accessible information on the product and territory.
- **BLOCKCHAIN & SMART CONTRACTS:**
Safe and transparent traceability.
- **DRONES AND ENVIRONMENTAL SENSORS:**
Real-time monitoring of crops and the environment.
- **APPS AND DECISION SUPPORT SYSTEMS (DSS):**
Support for agricultural management and product traceability.

BENEFITS AND IMPACT

- **ENVIRONMENTAL SUSTAINABILITY:**
Reduction of environmental impact with innovative practices.
- **ECONOMIC COMPETITIVENESS:**
Increased efficiency, reduction of waste, increased profitability.
- **SOCIAL AND CULTURAL IMPACT**
Consumer trust and promotion of responsible consumption.
- **INTEGRATION AND COLLABORATION**
Exchange of knowledge and improvement of agricultural practices.

OUR PROJECTS:

APP SINIS, AC2S & TRACCE

FOCUS: Supply chain traceability.

OBJECTIVES:

- A. Transparency and Traceability**
QR code and blockchain to guarantee trust and security
- B. Territorial Development and Tourism**
Connect local products to cultural and natural heritage
- C. Agricultural Sustainability and Innovation**
Sustainable techniques and environmental monitoring to improve crops and land
- D. Collaboration and Network**
Coordinated system between farmers, processors, researchers and consumers

PROJECTS: AC2S, APP SINIS & TRACCE

QR Code and Digital Platforms

Used to ensure advanced traceability of products, and to provide consumers with access to information relating to production and territory.

Blockchain and Smart Contracts

Implemented to ensure safe and transparent traceability throughout the supply chain, increasing trust between producers and consumers.

Drones and Environmental Sensors

Used to monitor crops and environmental conditions in real time, optimizing natural resource management and improving agricultural planning.

Apps and Decision Support Systems (DSS)

Mobile apps are used for product traceability, and DSS supports agricultural resource management, enabling more informed decisions.

TECHNOLOGIES USED



LARGE SCALE IMPLEMENTATIONS

01



Expansion and replicability of models

Projects developed in Sardinia, such as those in the viticulture sector and the cereal supply chain, can be replicated in other agricultural areas with similar conditions.

02



Synergies between different sectors

Le soluzioni tecnologiche sviluppate non si limitano a singoli settori ma possono essere integrate per creare sistemi agricoli più completi e interconnessi, che abbracciano la viticoltura, l'allevamento, la gestione idrica e la produzione cerealicola.

03



Training and Education

The adoption of these new technologies requires a significant commitment to training farmers and industry professionals so that they can get the most out of the innovations.

04



Support Policies and Funding

To promote the diffusion of these solutions on a large scale, continuous support from institutions is needed, with incentive and financing policies dedicated to the adoption of innovative technologies.

Conclusions

The projects presented are **innovative initiatives** that aim to transform the Sardinian agricultural and agri-food sector, and beyond, using **advanced technologies** to **improve productivity, sustainability** and the quality of production.

Each project addresses sector-specific challenges, from viticulture to sheep farming, from water management to the cereal chain, implementing digital solutions ranging from artificial intelligence to IoT sensors to decision support systems. The introduction of technologies such as **blockchain, drones, environmental sensors and AI predictive models** is opening up new horizons for more efficient and transparent management of resources, improving the competitiveness of businesses and meeting consumer needs for more sustainable and traceable products.



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