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Digital and PLF technologies: gaps between sheep and goat farmers' needs and existing solutions

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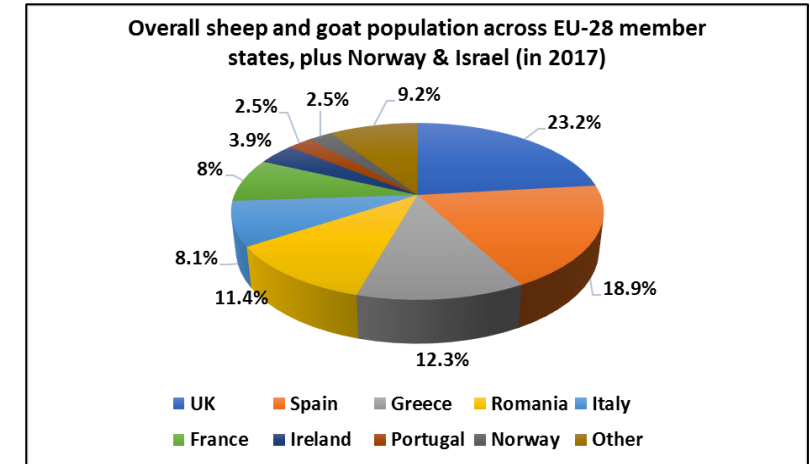
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Sm@RT received funding from the European Union's Horizon
2020 research and innovation programme under grant
agreement № 101000471

1. Background

- Sheep & Goats in Europe
- Challenging environments & varied production systems
- Important societal, environmental and cultural roles, especially in mountain areas
- Labour issues
- Technology can improve production efficiency
 - Technology & innovation uptake is slow
 - Does technology answer farmers' needs?



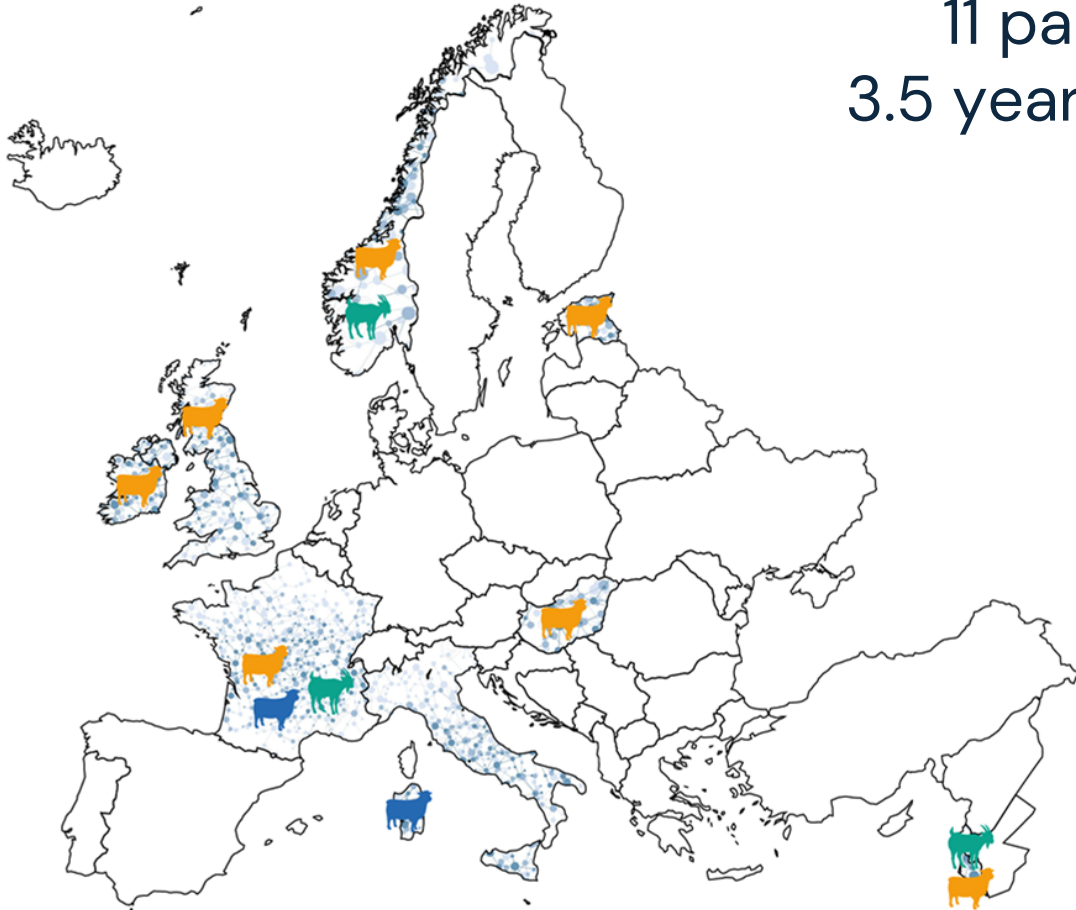
2. Thematic Network

- **Sm@RT: Small Ruminant Technology** – PLF and Digital technologies for small ruminants
 - Objectives :
 - To create a European **network** around the **use of PLF and digital technologies** in small ruminants
 - To encourage **knowledge exchange**, new technologies **adoption** and **communication** between farmers and stakeholders of the small ruminant sectors.
- Series of national & international workshops & participatory activities



3. Participants

8 countries
11 partners
3.5 years project



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Estonia



France



In Extenso
Innovation Croissance

Hungary



Ireland



Israel



Italy



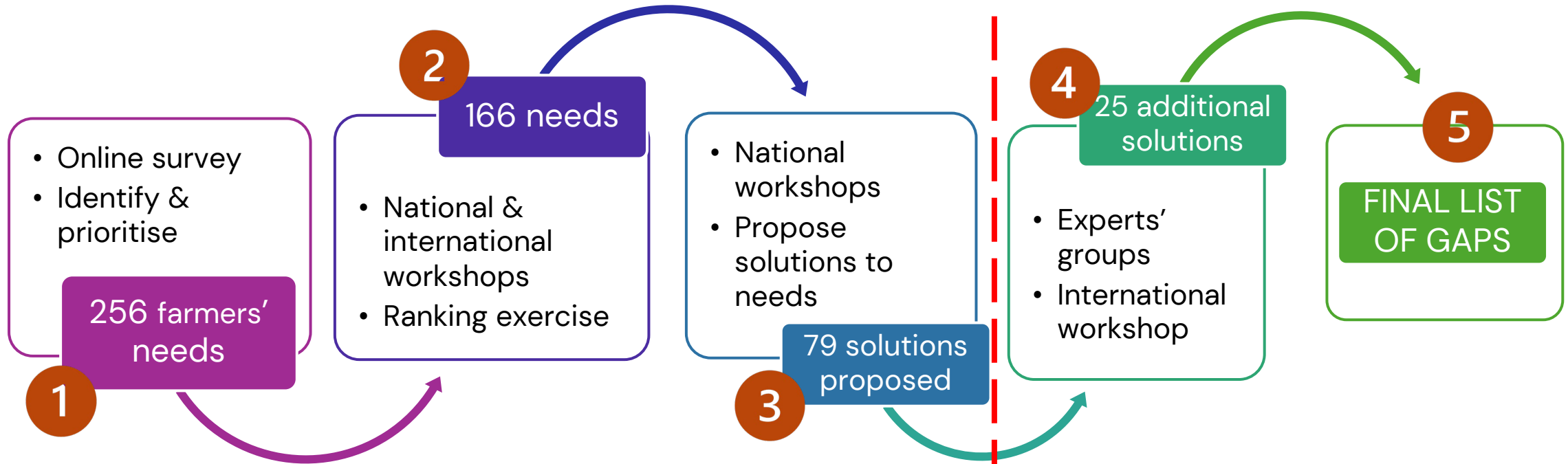
Norway



UK



4. Methods



5 themes:

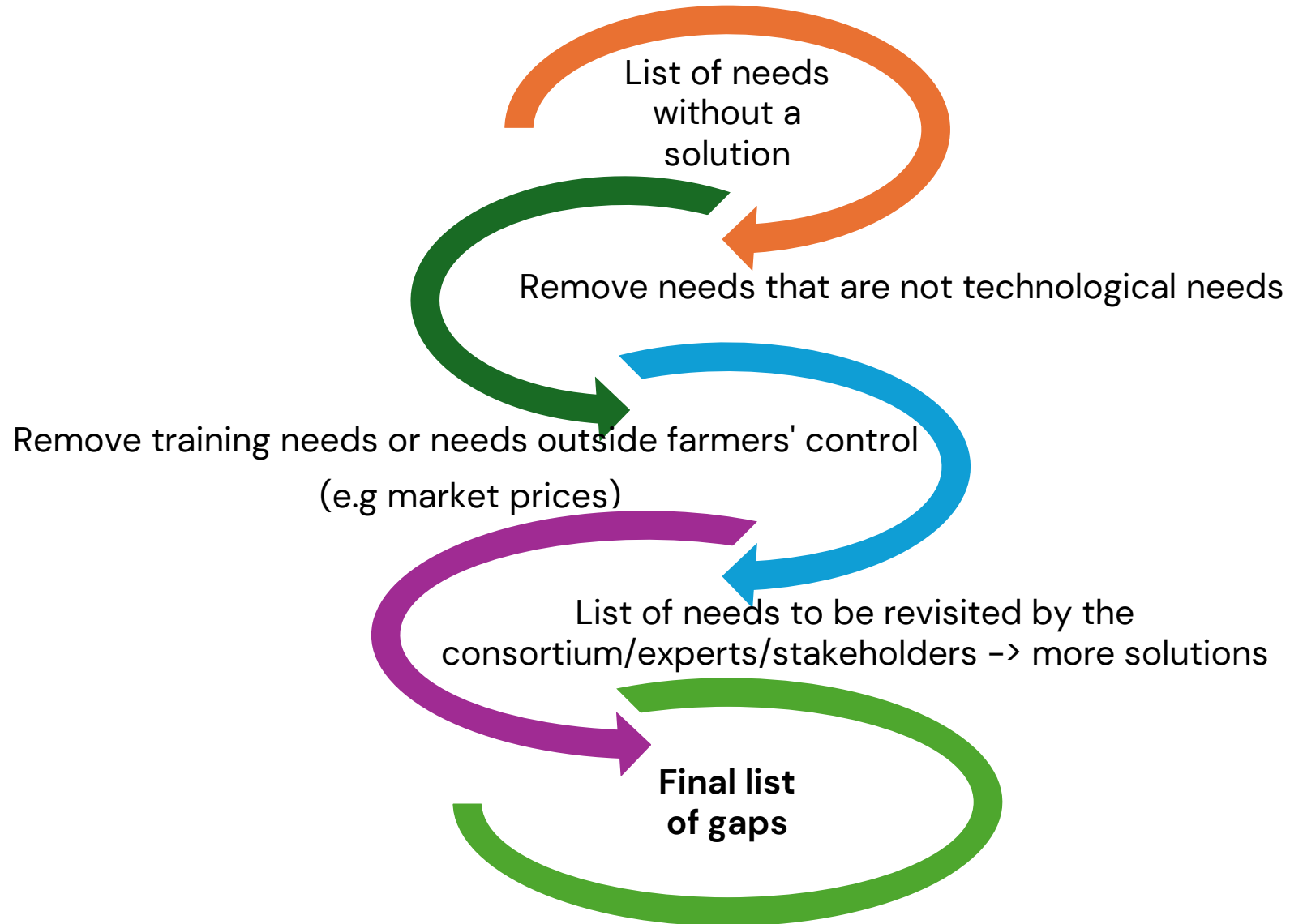
- Grazing/Feeding
- Reproduction
- Health & Welfare
- Herd/flock management
- Milking/Fattening



3 productions:

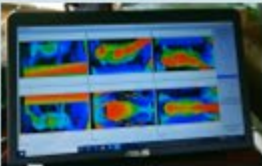
- Meat sheep
- Dairy sheep
- Dairy goats

4. Methods

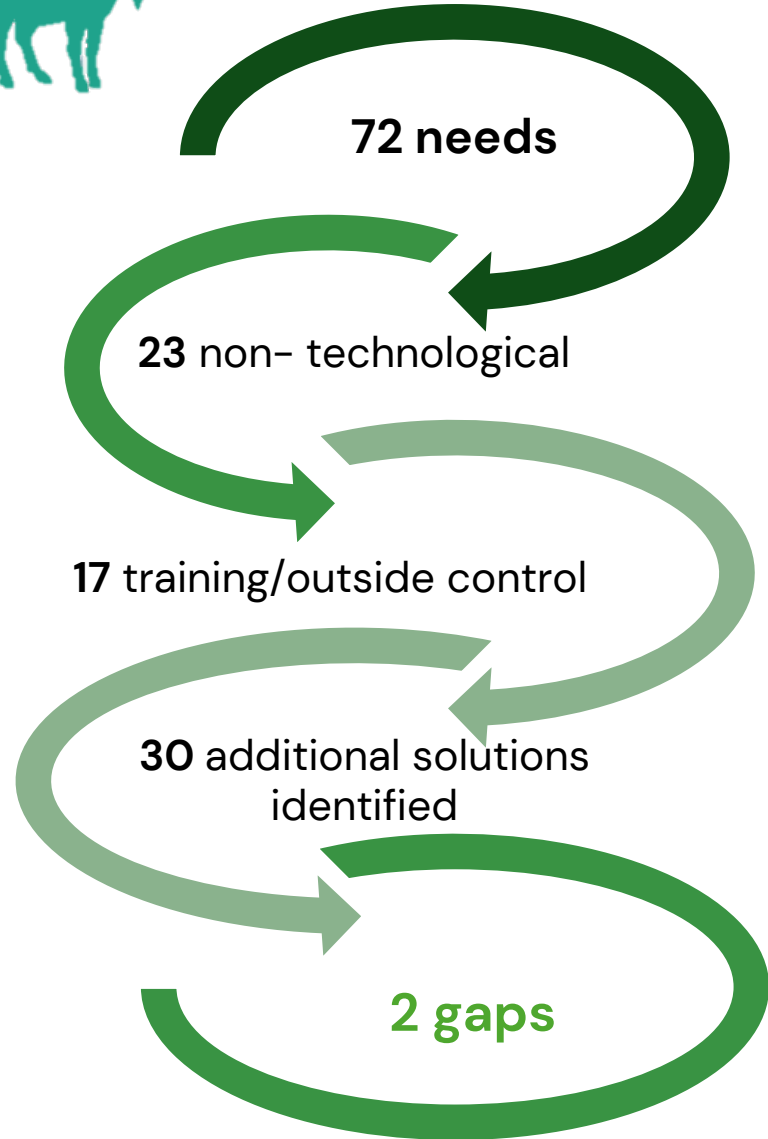
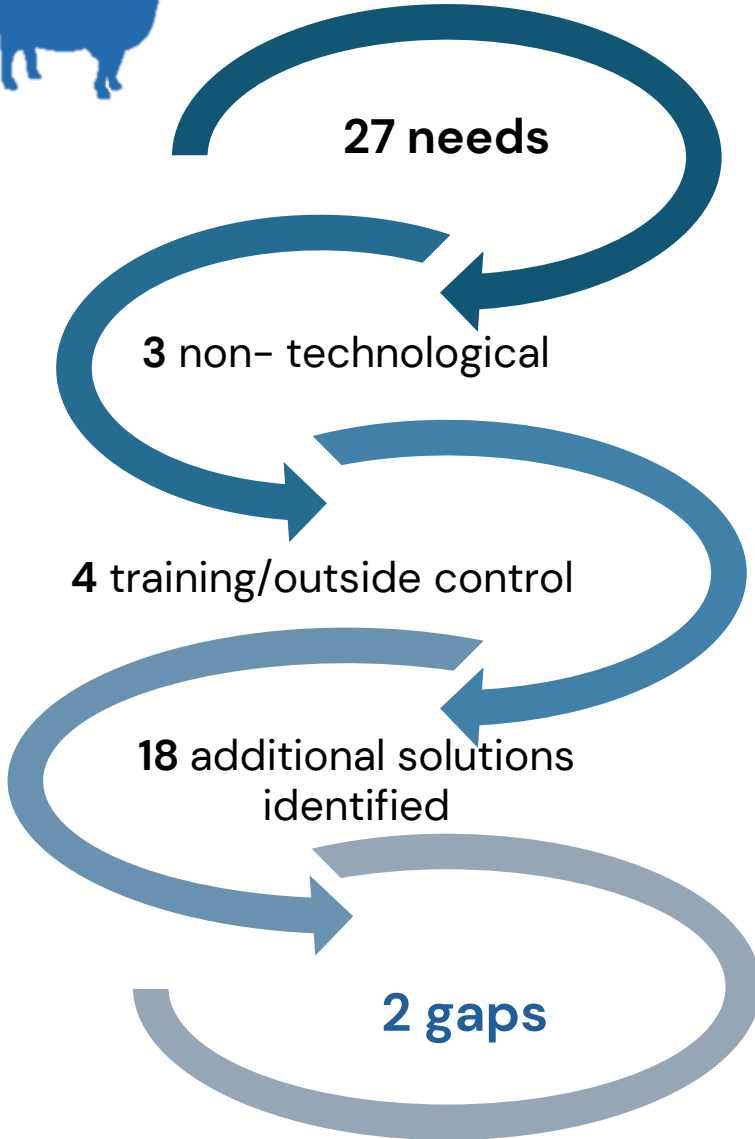


5. Results – initial prioritised solutions



Aptimiz app 	Auto-drafter 	Automatic feeder 	Automatic grass plate meters 	Connected fences 
Dairy Parlour EID reader 	DNA parentage 	Drone 	EID-enabled water trough 	EID-enabled weigh crate 
EID stick readers 	Farm management software 	FEC Pak 2 	Feed ration planner 	Flock recording app 
GPS Collars 	Milk feeder for kids/lambs 	Milk flowmeter 	Milk tank weigh scale 	Portable NIRS 
Post dried hay technology 	Pregnancy scanning 	Shed cameras 	Sheep conveyor 	Somatic Cell Counter 
Virtual fence 	Walk Over Weigh 	Water meter 	Weather station/fan cooler 	3D imaging 

5. Results



5. Results – examples additional solutions

Topic	Need	Digital/PLF solutions?
Reproduction	Automatized following of the reproduction (warnings at every step) 	• Oestrus detector (Alpha detector) • A bolus to record temperature
Reproduction	Identifying/controlling abortion issues 	• Trough AI • Cameras • Isolation & recording ewes with abortion • Walk over Weigh to record unexpected liveweight change
Reproduction	Protection from predators of different mating groups at mating 	• Activity monitors • High tensile fences with hot wires and dog • FindMy (distress warning under research)
Health/Welfare	Udder health/mastitis 	• Portable somatic cell counters (only experimental) • Camera to detect mastitis (Infra-Red)? • UHF readers to identify animals at the back when moving
Health/Welfare	Early detection / tools to prevent diarrhoea in lambs 	• FEC pack to check worm counts • Daily weight gain recordings
Health/Welfare	Early diagnosis of some infectious diseases (rams) 	• Trough AI • Record eye temperature daily (only experimental)
Health/Welfare	Prevention and diagnosis of lameness 	• Activity/distance walked may alert lameness

6. Summary of needs, solutions & gaps



Meat sheep

- 117 needs
- 90 are technological
- 53 solutions
- No gaps



Dairy sheep

- 43 needs
- 36 are technological
- 18 solutions
- 2 gaps



Dairy goats

- 96 needs
- 56 are technological
- 33 solutions
- 2 gaps

2 Gaps linked to Milking:

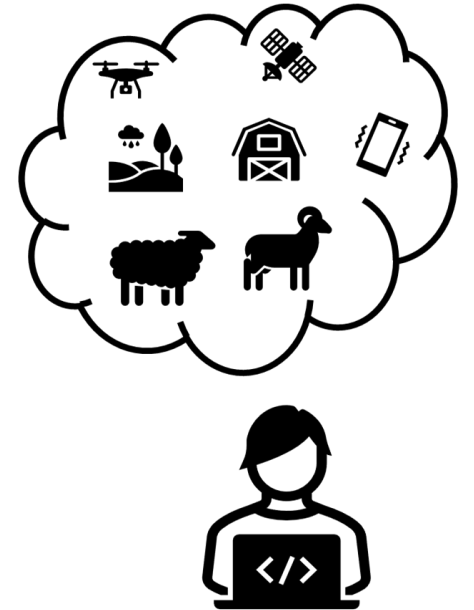
- ❖ Dipping/cleaning udder before milking
- ❖ Milking machine management/alerts for changing consumables/parts

7. Conclusions

- Over 250 individual farmers' needs over 3 productions
- Most could be answered (only 2 gaps)
- 77 individual technological solutions (across 3 productions)



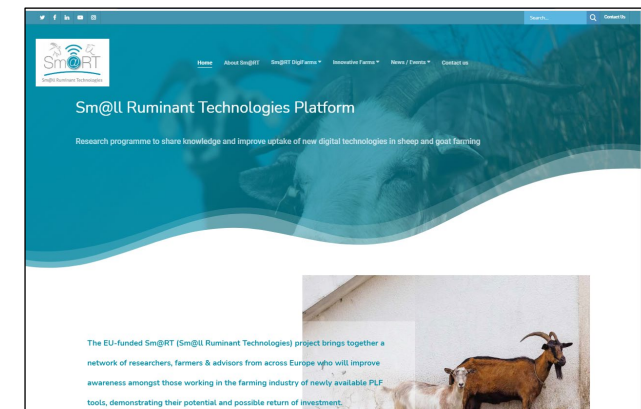
options available to sheep/goats farmers



BUT...

- Available? Affordable? Accessible?
 - Cost-benefit analysis is crucial
- Specific training & financial support
- Some need adapting (e.g. algorithm, size of kit, etc.)

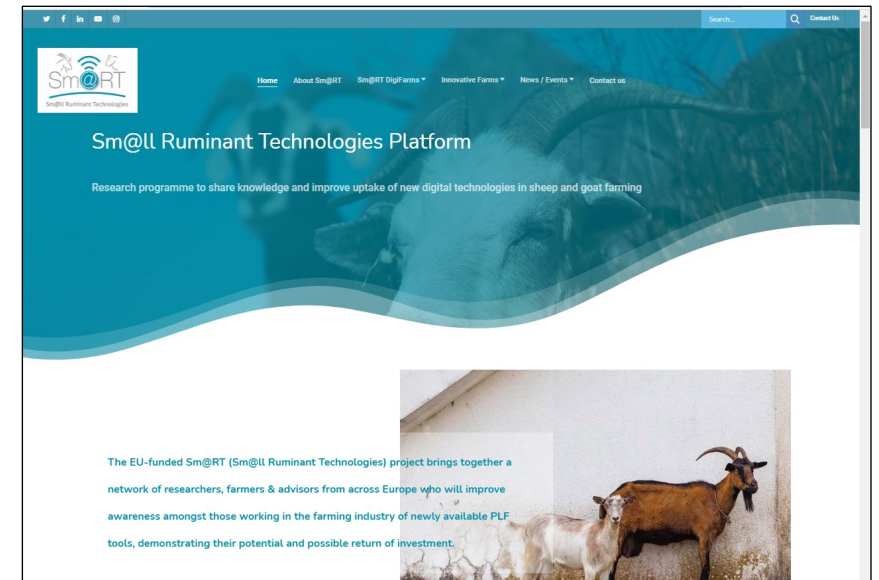
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7. Conclusions



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Acknowledgments



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All the farmers and stakeholders in the 8 countries for their feedback and participations to the workshops