

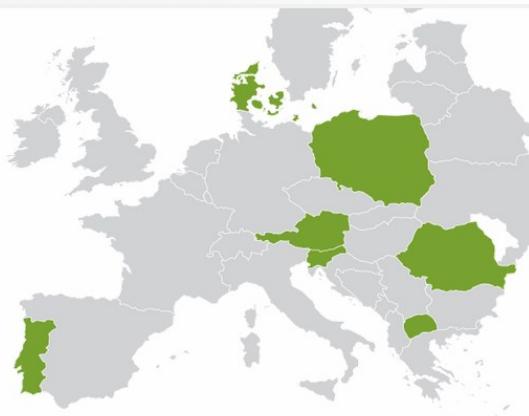
Predstavitev projekta AgroIT

AgroIT: Increasing the efficiency of farming through an open standards based AgroIT platform

Stran • 1

Prijava projekta

- Vsebina projekta
- Proračun
- Ostali elementi



Stran • 2

Ali je kmetijstvo področje primerno za uvajanje emPoslovanja?

- Večje kmetije morajo voditi računovodstvo
- Voditi morajo evidenco o živalih
- Glede na EU direktive morajo poročati (če želijo prejemati subvencije) raznovrstne podatke. Kako naj pridobijo te raznovrstne podatke?
- Kmetje so veliko na terenu

Stran ▪ 3

Kaj so visoki stroški kmetij in torej „kandidati“ za optimizacijo?

- Gnojila
- Škropiva
- Gorivo

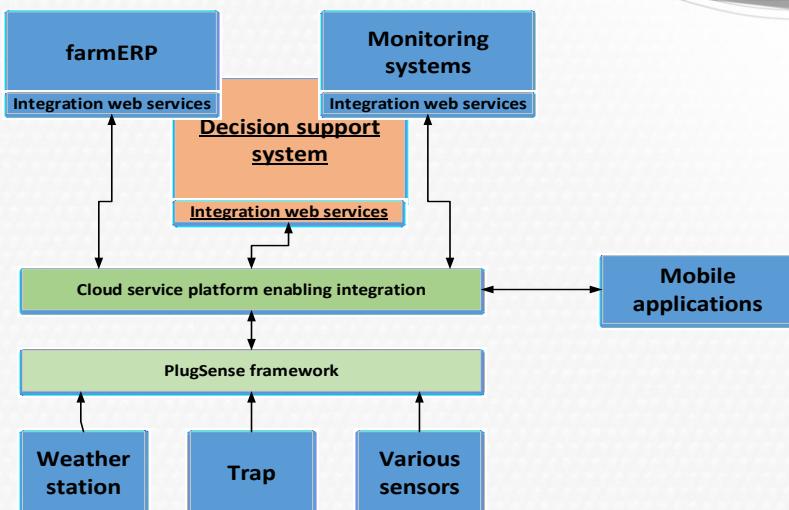
Stran ▪ 4

Trenutno stanje programske opreme na področju kmetijstva

- Vse več ponudnikov aplikacij za kmetijstvo
- Aplikacije za različna, praviloma precej ozka področja
- Največji problem: aplikacije med seboj niso integrirane

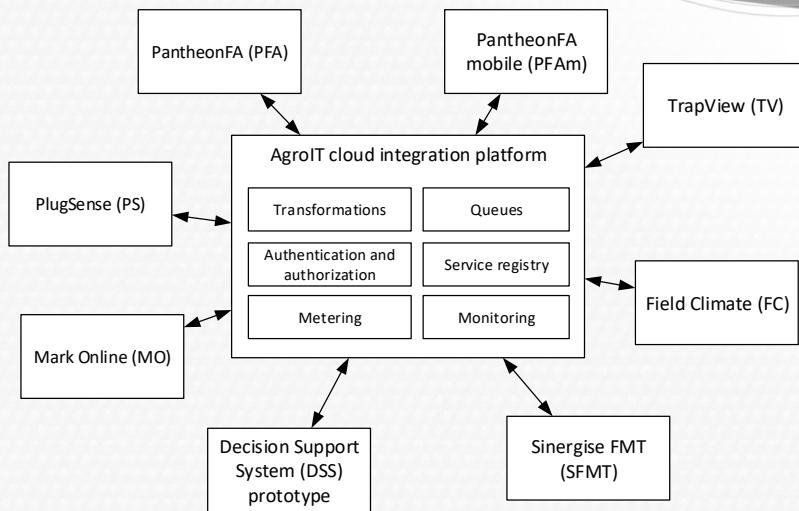
Stran • 5

Ideja projekta



Stran • 6

Razvoj cloud platforme preko katere se bodo aplikacije integrirale



Stran • 7

Cilji projekta

- Implementacija mobilnih aplikacij
- Implementacija zbiranja različnih podatkov
- Implementacija sodobnih metod za podporo odločanju
- Razvoj *cloud* platforme preko katere se bodo aplikacije integrirale
- Oblikovanje in prijava standarda za integracijo preko *cloud* platforme

Stran • 8

Implementacija mobilnih aplikacij

- Kakšne mobilne aplikacije potrebujejo kmetje?
- Uporabniški vmesniki
- Vnos podatka na mestu njegovega nastanka
- Izguba mobilne naprave

Stran • 9

farmERP sistem

Stran • 10

Localizations 1/3

▪ Translation of PANTHEON Farming

- Functionalities, reports, dashboards, video and written user manual...

▪ Development of new functionalities

- Specific functionalities for individual country
- Global functionalities based on demands for individual country

▪ Adaptation of existing functionalities based on demands of different localizations

▪ Development of country specific reports

- Development of new reports
- Reuse of existing reports with adaptations

Strona 11

Localizations 2/3

The screenshot shows the PANTHEON Farming software interface. At the top, there's a toolbar with various icons. Below it, a header bar displays 'Plan kont' (Plan account), 'Wazny od: 1.1.2016', and 'Uwaga' (Note). The main area is divided into two sections:

- Left Section (Plan kont):** A table listing account details. Columns include: Konto (Account), Nazwa (Name), Pod. (Subsidiary), Lp. (Line), Odset. (Interest), Nost. (Nostro), Wn/Wn Konto (Bank/Bank account), Dok. (Document), Spr. (Supplier), Data (Date), Powiz. (Associated), Dok.z Wal. (Document in foreign currency), Zamk. Uw. (Lock Note), Arch. (Archive), Akt. CIT (Active CIT), Röbr. Krieg. w/w (War risk), and Ostatn. fakt. (Last invoice). Most columns have dropdown menus or checkboxes.
- Right Section (Detailed View):** A large window titled 'An das Plankont' (To the plan account) containing a grid of data. It includes a note about finding information on additional planning subjects at www.panteon.com.pl. The right side of this window features a '2015' timeline with boxes for '1. Jahresabschluss (Statement of financial position)', '2.1. für den Jahresabschluss', '2.2. für das Konsolidierungsabschluss', and '3. Jahresabschluss (Statement of financial results)'. Below this are sections for 'Angaben zum Unternehmen' (Information about the company) and 'Angaben zum Geschäftsjahr' (Information about the fiscal year).

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Localizations 3/3

The screenshot displays two windows side-by-side. On the left is a 'Plan de conturi' (Chart of Accounts) window titled 'Numar: Kointri plan 1...' with a status bar indicating 'Valid din: 1.1.1990 - Isonalizare'. It lists account codes from 1000 to 1100, each with a name and a checkbox labeled 'Nu cere confirmare'. On the right is a 'Report: DSC - Form 300' window titled '2010_A1108 (08.03.2010)'. It shows a tax declaration for 'DECONȚ DE TAXĂ PE VALOAREA ADĂUGATĂ' (300). The form includes fields for 'Tip decou TVA' (VAT type), 'An' (Year), 'Luna' (Month), and a checkbox for 'În baza datei se aplică metoda simplificată pentru operațiuni interne'. Below the form are sections for 'DATE DE IDENTIFICARE A PERSONELUI IMPONZABIL' (Identification data of the liable person) and 'ADRESA' (Address). At the bottom, there are fields for 'TELEFON' (Phone), 'FAX', 'EMAIL', 'Baza' (Base), 'NR.44', 'Cet', and '02010-023002412'. A note at the bottom right says 'Pro rata de deducere %'.

Decision making assistance 1/5

▪ Dashboards

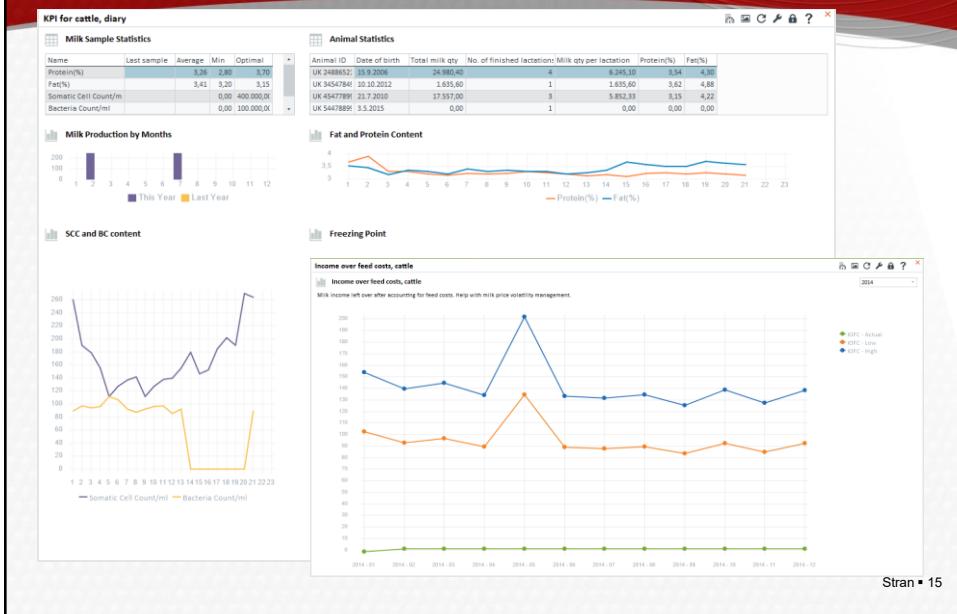
- Developed as assistant to overview and compare inserted data
- Divided by modules, include technical and financial aspect
- Automatically recalculated
- Integrated mechanism to create custom dashboards and ad-hoc analyses

▪ Reporting (clickable, interactive)

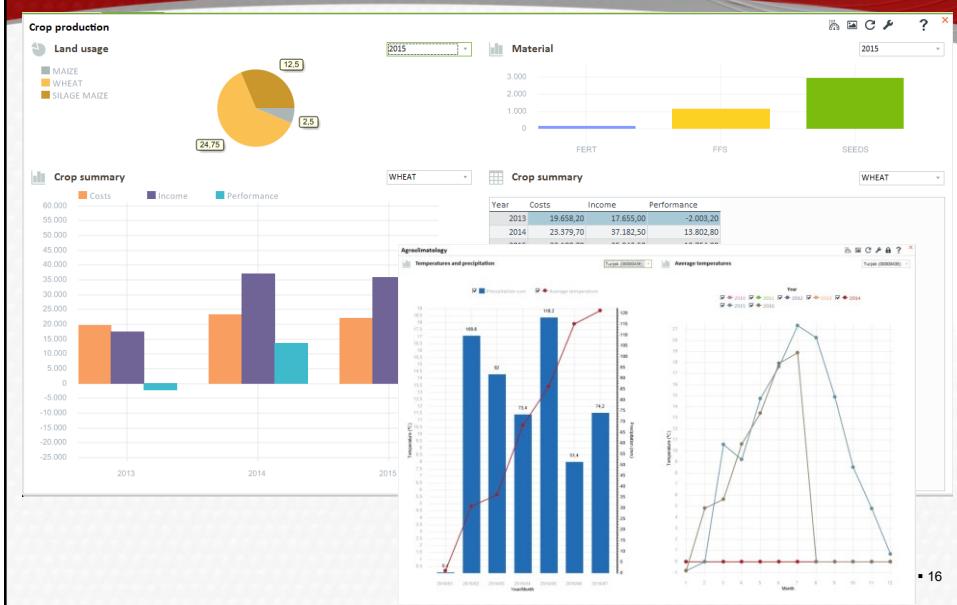
- Developed reports for state reporting
- Focus on fertilization and spraying
- Technical reports show management details
- Possible to export reports (Pdf, Word, Excel, Email...)
- Integrated mechanism to prepare custom reports

Stran • 14

Decision making assistance 2/5



Decision making assistance 3/5



Decision making assistance 4/5

Crops
Task Log

Date	Crop type	Action	Variety	Quantity	Parcel ID	Common name
01.05.2011	BIRUTUS	CULTIVATION			1706802	Field for corn
03.05.2013	BIRUTUS	SOWING	BRUTUS (S)	60 KG	1706802	Field for corn
04.04.2014	WHEAT	SOWING	INGENIO (S)	350 KG	1706802	Field for wheat
09.10.2010	BIRUTUS	PLOUGHING			1706802	Field for corn
12.10.2013	INGENIO	SOWING	INGENIO (S)	1155 KG	1706802	Field for wheat
12.10.2013	INGENIO	SOWING	INGENIO (S)	1155 KG	598377	Second field
15.03.2014	WINTER BARLEY	SOWING	INGENIO	1000 KG	598377	Second field
30.06.2011	BIRUTUS	Grass cut..mch.			1706802	Field for corn
30.09.2011	INGENIO	PLOUGHING			598377	Second field

Company: 000123456
Kopnka 93
SI-1000 LJUBLJANA
User: Administrator
Report date: 7.12.2015 10:00:02
Report period: all records
Control number:
Sheet: 1

Date of use	Fertilizer type	Quantity	Parcel ID	Common name
05.05.2014	COW MANURE	870 KG	1706802	Field for wheat
05.06.2013	UREA	720 KG	1706802	Field for corn
06.04.2012	POTT SUL	1100 KG	1706802	Field for wheat
06.04.2012	POTT SUL	1100 KG	598377	Second field
09.10.2013	COW MANURE	7200 KG	1706802	Field for corn
13.02.2012	NPK 6-18-24	1925 KG	1706802	Field for wheat
13.02.2012	NPK 6-18-24	1925 KG	598377	Second field
15.05.2014	COW MANURE	150 KG	598377	Second field
20.09.2011	POTT SUL	550 KG	1706802	Field for wheat
20.09.2011	POTT SUL	550 KG	598377	Second field

Company: 000123456
Kopnka 93
SI-1000 LJUBLJANA
User: Administrator
Report date: 7.12.2015 9:58:21
Report period: all records
Control number:
Sheet: 1

Decision making assistance 5/5

LIVESTOCK | REGISTER

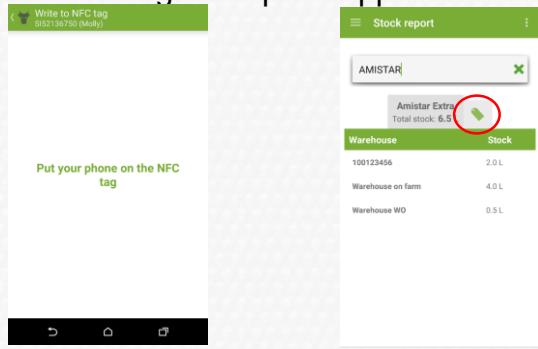
Animal productivity

Animal ID	Animal name	Date of birth	Age in Y/M/D	Breed	Weight	Dam ID	Dam name	Sire ID	Sire name	Status	Milking control	Lifetime milk
UK04886521	Fani	15.9.2006	5/6/20	HOLST.-FRIESIAN	60	UK59867632	Mika	UK25463388	Vrsta	IN LACTATION		24980,4
UK5477412	Muka	26.10.2010	5/5/9	HOLST.-FRIESIAN		UK2486521	Fani	UK247877	Luka	ACTIVE		
UK26359874	Fida	10.11.2011	4/4/25	Cika cattle		UK2486521	Fani	UK4811236	Murk	SLOK		
Group: Not in group	Responsible persons:											
001	HOLST.-FRIESIAN ACTIVE											
002	HOLST.-FRIESIAN ACTIVE											
003	HOLST.-FRIESIAN ACTIVE											
004	HOLST.-FRIESIAN ACTIVE											
005	HOLST.-FRIESIAN ACTIVE											
006	HOLST.-FRIESIAN ACTIVE											
1111	11	1.1.2005	11/3/4	ABERDEEN ANGUS						ACTIVE		
UN001		1.8.2015	0/8/3	HOLST.-FRIESIAN	16					ACTIVE		
UN002		1.5.2015	0/11/4	HOLST.-FRIESIAN	90,6					ACTIVE		
UK15454		5.7.2014	1/9/0	HOLST.-FRIESIAN						ACTIVE		
UK222222222		2.9.2013	2/7/2	HOLST.-FRIESIAN	350					ACTIVE		
UK3294473	Lenka	28.11.2001	14/4/15	HOLST.-FRIESIAN		UK3394788	Gredi	UK5987474	Hink	ELIMINATED		
UK54777412	Mika	1.1.2015	1/3/4	HOLST.-FRIESIAN						ACTIVE		
UK584545	Ferdinand	21.2.2014	2/1/12	HOLST.-FRIESIAN		UK2486521	Fani	UK56407954	Mars	ACTIVE		
UK5987362	Mika	4.2.2004	12/2/1	HOLST.-FRIESIAN		UK2584473	Lenka	UK8744711	Tak	IN LACTATION		
UK935773812	Ferdinand	20.12.2013	2/3/15	HOLST.-FRIESIAN		UK2486521	Fani	UK247877	Luka	ACTIVE		

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NFC integration in mobile application

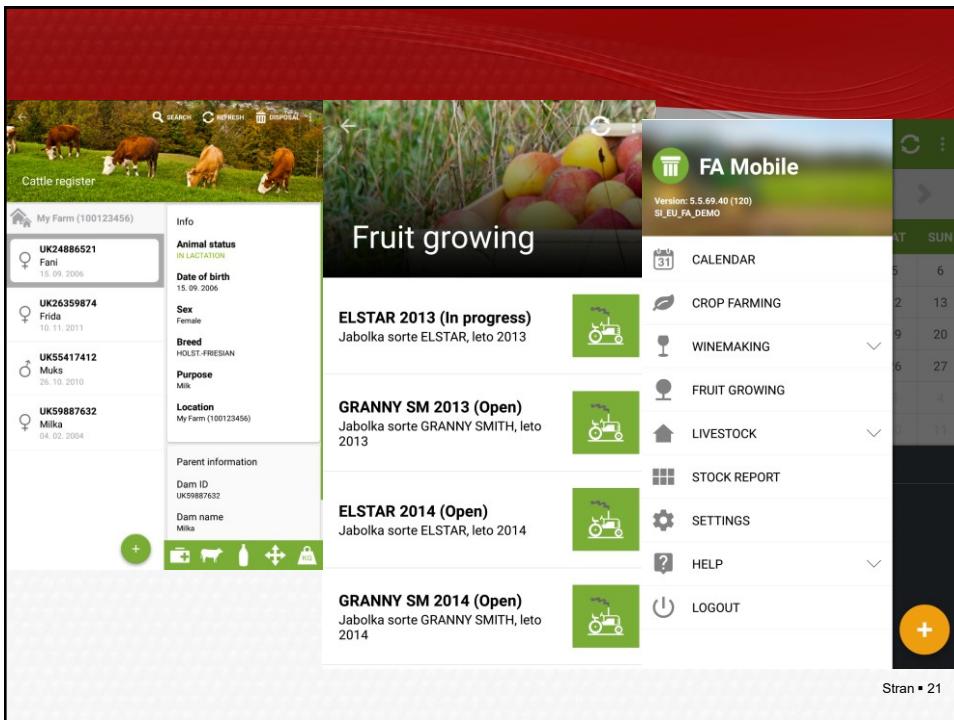
- Very useful in recognition of different elements
 - Animals, materials in warehouse...
 - No need for search, automatically opens scanned element
- Enables creation and identification of NFC tag
- Recognizes created tag and opens application



Stran • 19

The image shows a mobile application interface. On the left is a calendar for September 2015. A specific date, Wednesday, 23. September 2015, is highlighted in green. To the right of the calendar are several cards representing agricultural tasks:

- Crop farming**: An image of wheat stalks.
- Vineyard tasks**: An image of vineyard rows.
- WINTER BA 2014 (In progress)**: WINTER BARLEY, year 2014. Includes a tractor icon.
- CHARDONNAY 2014 (In progress)**: Grape CHARDONNAY, year 2014. Includes a tractor icon.
- WHEAT 2018 (In progress)**: WHEAT, year 2018. Includes a tractor icon.
- CHARDONNAY 2015 (Open)**: Grape CHARDONNAY, year 2015. Includes a tractor icon.
- ELSTAR 2014/1 (Open)**: Apple ELSTAR, year 2014. Includes a tractor icon.
- MERLOT 2015 (Open)**: Grape MERLOT, year 2015. Includes a tractor icon.
- SILAGE CORN 2015 (Open)**: SILAGE CORN, year 2015. Includes a tractor icon.
- MERLOT 2014 (Completed)**: Grape MERLOT, year 2014. Includes a tractor icon.



Other functionalities 1/6

- Extend PANTHEON Farming to other sectors which complement the integrity of *Farm Resource Planning (FRP)*
 - Pig fattening
 - Poultry breeding
- Improvement of existing sectors with added functionalities
 - Codebook imports from web service
 - Feeding plans preparation
 - Feeding module

Stran • 22

Other functionalities 2/6

- Pig fattening enables recording of pigs for fattening with traceability of individual group , tracking of used materials (feeds, vaccines...) and costs.

The screenshot shows the 'Groups overview' section with a holding ID of 100123456, one group named 'PigGroup1' with 154 animals, and a total of 104 animals. Below this is the 'Events' tab, specifically the 'Arrivals' sub-tab, displaying three entries:

Serial No.	Breed	Arrival Date	No. of animals on arrival	Current No. of animals	Document	Arrival Type
999999/01	HYBRID 1244	15.2.2016	50	50	161000000001	Purchase
999999/01	HYBRID 1244	21.7.2016	100	100	161000000008	Purchase
235644/01	HYBRID 1244	19.2016	4	4	161000000011	Purchase

Stran • 23

Other functionalities 3/6

- Poultry breeding module enables recording of poultry for fattening with traceability of individual group , tracking of used materials (feeds, vaccines...) and costs.

The screenshot shows the 'List of Animals' section with a holding ID of 100123456, one group named '5621477' with breed 'BROILERS', and a total of 130 animals. Below this is the 'Events' tab, specifically the 'Arrivals/Departures' sub-tab, displaying two entries:

Date	No. of animals	Document	Event Type
1.2.2016	130	161000000004	Purchase
16.3.2016	20	163000000004	Death

Stran • 24

Other functionalities 4/6

- Setup wizard enables simplified database implementation by user. Same goes for import of codebooks for web service for different localization. This enable unified data (easier data comparison) and import of predefined values

Other functionalities 5/6

- Feeding plans enable mix of feed based on quality of individual feed component and needs of different animals (milk and meat). Simple selection of feed component and automatic recalculation of feed parameters are connected with costs that enables mixing of best possible feed at lowest price.

Other functionalities 6/6

- Feeding module enables distribution of meal plan to individual animal, animal group (based on location) or feeding group. In process of feeding recording costs are calculated and traceability is established from feed to

The screenshot displays the 'Feeding' application interface. On the left, a 'Tasks' list shows various farm activities like Manure Shoveling and Feeding with their start and end times. In the center, 'Animals' are listed under categories such as 'Not in group', 'Female milking animals', and 'Weight under 50 kg'. On the right, 'Workers' are assigned to tasks, and 'Resources' like tractors and animals are tracked with details like ID, name, and location.

Implementacija zbiranja različnih podatkov

- Senzorji
- Elektronska past za insekte
- Mobilne vremenske postaje
- Kaj je dodana vrednost (zbiranja) teh podatkov?

Mobilna vremenska postaja

- Gre za platformo, ne le za aplikacijo
- Spletna in mobilna aplikacija
- Vremenska postaja na terenu: sadovnjak, vinograd, travnik
- Problem slabega GSM signala

Stran • 29



Stran • 30





Imetos Track: A platform for agricultural sensing for vehicles (tractors, sprayers, combines).



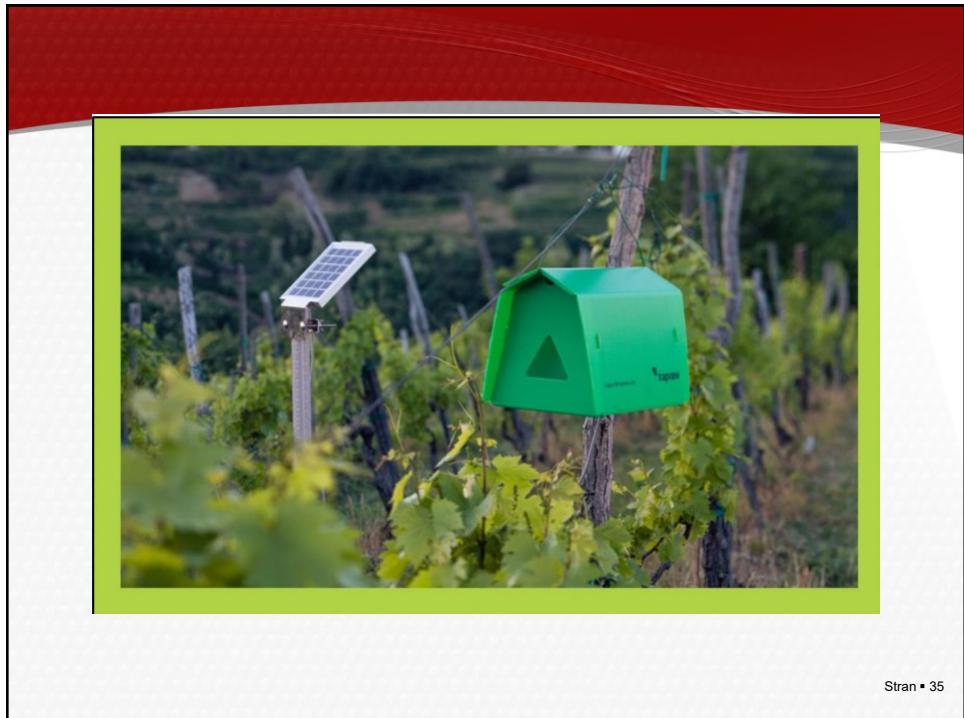
 AGRO IT[®]
advanced farm management

Stran • 33

Elektronska past za insekte

- Gre za platformo, ne le za aplikacijo
- Spletna in mobilna aplikacija
- Vremenska postaja na terenu: sadovnjak, vinograd

Stran • 34



Stran • 35

A screenshot of the Trapview software interface. The main window shows a tray containing several insects, with yellow boxes highlighting specific ones for closer inspection. The interface includes a toolbar on the left, a menu bar at the top, and various status indicators.

Stran • 36



Stran • 37

The screenshot shows a trapview interface with a red header. On the left, there's a sidebar with sections for Devices with no location defined (S02130, S02258, S02168), Devices with no pest selected (S02150, S02168), and Devices with low battery level (S02149, S02150, S02243, S02246, S02185). The main area is titled 'trapview' and shows a location in Budureasca - Dealu Mare, Device S02167 S02167. It features a grid of images showing trap activity over time, with a zoomed-in view of a specific trap image at the bottom. The trap image shows small yellow dots representing pests. A legend identifies the pest as 'Pest: European grain weevil moth (Lobesia terrana)' and the season as 'Season: 2016'. There are also buttons for IMAGE, WEATHER CHART, PEST CHART, REGION MAP, and SEARCH.

Email notification of TODO list; automatic recognition of new/additional pests,..

Stran • 38

Dashboard; image overview; pest statistics; setting parameters via SMS ...

Stran • 39





AI on big data based area-wide monitoring and forecasting

The image shows two screenshots of the Trapview mobile application. The left screenshot displays a map of Europe with a color-coded pest pressure heatmap. A vertical legend on the left indicates pressure levels from 'Low' (light green) to 'High' (yellow). The right screenshot shows a detailed forecast for 'TODAY' at 'Plot #12.3W', featuring a large icon of a leaf with eggs and a table of pest activity predictions for the next four days:

Date	Pest Type	Activity Level
Sunday	Eggs	●
Monday	Larvae	~
Tuesday	Larvae	~
Wednesday	Adult	■

Carrier 11/10/17 7:00 AM 10:09 AM Trapview

RAVENNA 11/10/17 7:00 AM Carrier 10:09 AM Trapview

PEST FORECAST PEST PRESSURE

CALENDAR TODAY Plot #12.3W

Eggs Larvae Adult

Sunday Monday Tuesday Wednesday

Stran • 42

Senzorji na terenu in v prostorih

Stran • 43



PlugThings)) Agro Solution



Stran • 45

Libelium Boards (1/2)

Smart Agriculture & Smart Agriculture PRO



Communication

- 3G/GPRS
- WiFi

Useful for

- Crops monitoring
- Measure plants stress levels
- Pest control
-
- Strawberries
- Vineyards
- Olives
- Grapes
- ...

Measure:

- Soil moisture;
- Soil temperature;
- Leaf wetness;
- Solar radiation;
- Atmospheric pressure;
- Anemometer;
- Wind vane;
- Pluviometer;
- Air temperature;
- Air humidity;

Stran • 46

Libelium Boards (2/2)

Smart Environment & Smart Environment PRO



Communication

- 3G/GPRS
- WiFi

Useful for

- Animal Monitoring
- Barn Monitoring
- Environmental Impact Monitoring

• ...

- Equine management to reduce costs prevent illnesses
- Cow expelling gases management
-

Measure:

- Carbon Monoxide (CO)
- Carbon Dioxide (CO₂)
- Oxygen (O₂)
- Methane (CH₄)
- Ammonia (NH₃)
- Temperature
- Humidity
- Atmospheric pressure

Stran • 47

Key functionalities

The screenshots illustrate the key functionalities of the plugthings AGRO platform:

- Top Screenshot:** Shows a calendar interface for a "Farm 1" group. It displays a weekly calendar from Nov 22 to 28, 2015, with various events and tasks listed. A sidebar on the left allows users to manage groups and users.
- Middle Screenshot:** Displays a satellite map of agricultural land. Specific fields are outlined in orange, and data points are plotted on the map, likely representing sensor readings or field operations.
- Bottom Screenshot:** Shows a user profile for "User: Bruno Fernandes". It includes basic information like name, email, and account status (Active), along with a history of recent activities.

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Key functionalities

The image displays four separate browser windows of the plugthings web interface, each showing different monitoring and reporting features:

- Top Left:** A dashboard view showing a table of sensor data. The table includes columns for Name, State, Bus, Num, Sensor, Active Rule, Rule, and Device status. One row is highlighted in green.
- Top Right:** A monitoring screen displaying two line graphs for 'Bateria de Pórticos (ID da Plataforma: 80)' and 'Bateria de Pórticos (ID da Plataforma: 81)'. The graphs show battery level over time, with yellow areas indicating active periods.
- Bottom Left:** A table titled 'Alerts history' showing a list of alerts with columns for Alert ID, Alert Type, Alert Description, and Alert Status.
- Bottom Right:** A monitoring screen displaying two line graphs for 'Bateria de Pórticos (ID da Plataforma: 80)' and 'Bateria de Pórticos (ID da Plataforma: 81)'. The graphs show battery level over time, with yellow areas indicating active periods.

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This screenshot shows a detailed monitoring view for the entity 'Ark of Cereals' (Entity ID: 80). The interface includes:

- Left Sidebar:** A navigation menu with sections for 'Users', 'Entities', and 'Groups'. Below this are lists for 'Valley Farm', 'Farmville', 'Warehouse', 'Land', 'River Farm', and 'Homestead Kent'.
- Top Bar:** Includes a search bar 'Filter agent / group:', language selection ('English'), user information ('admin'), and a 'Logout' button.
- Main Content:** A 'Monitor' tab is selected. It shows four line graphs for different sensors:
 - AEOHMultisensor(ID da Plataforma: 80):** Shows Humidity (65%) and BatteryLevel (89%).
 - AEOHMultisensor(ID da Plataforma: 81):** Shows Luminosity (144) and BatteryLevel (89%).
 - AEOHMultisensor(ID da Plataforma: 82):** Shows temperature (19 °C) and BatteryLevel (89%).
 - FIRADoorSensorTEMPERATURE(ID da Plataforma: 80):** Shows Temperature (20 °C) and BatteryLevel (100%).

Stran • 50

Presentations of results

Pilot Partners in presented period worked mainly on:

- Installation and check of Libelium sensors,
- Improvement of the functionalities of Plugthings)) Agro software
- Implementation of Libelium sensors on farms in PL, DK, SLO.



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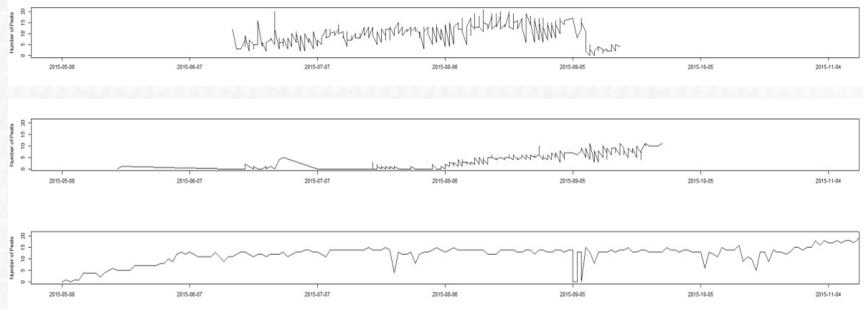
Implementacija sodobnih metod za podporo odločanju

- Metode vizualizacije
- Uporaba odkrivanja zakonitosti v podatkih

Stran • 52

Case study: Pest Dynamics

changes in the population of pests in a single location represents a time series



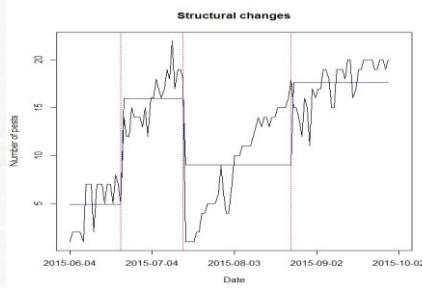
Stran • 53

Structural Change Detection

Models/
Analyses

detection of abrupt changes in dynamics of population

detected changes represent a basis for population modeling, raising alarms etc.)



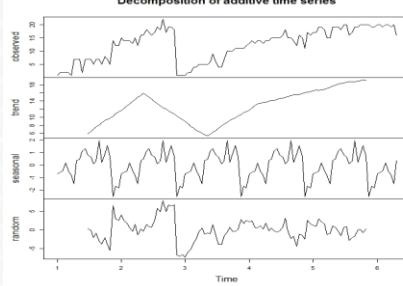
Stran • 54

Seasonal Decomposition

Models/
Analyses

the dynamics of pests population can be decomposed into separate components (the long- term movement, the periodic movement of a regular pattern, and the irregular noise)

the characteristics of these components provide insights into processes that drive the pests population.



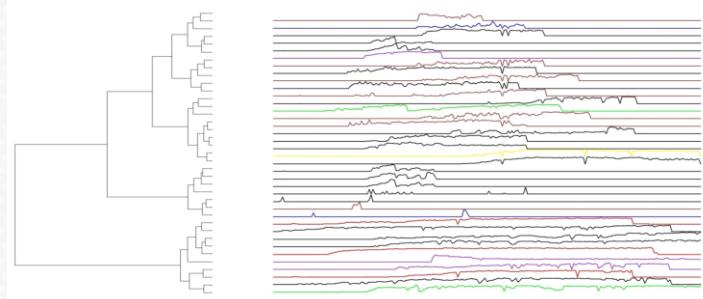
Stran • 55

Similarity Analysis

Models/
Analyses

similarity in the structure of the pests population curves can be used to suggest groups in data

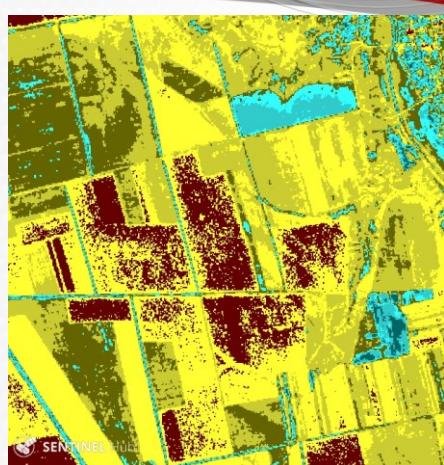
detected groups determine pests and sites with similar characteristics , which can improve further analyses



Stran • 56

GIS v kmetijstvu

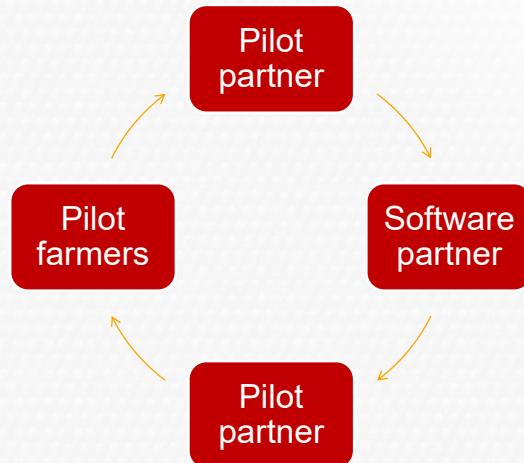
Stran • 57



9.1.18.29.3.29.3.4. 18.48.5. 15.5.4.6. 7.6. 17.6.27.6.14.7.17.7.24.7.27.7.6.8.

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Pilotni projekti

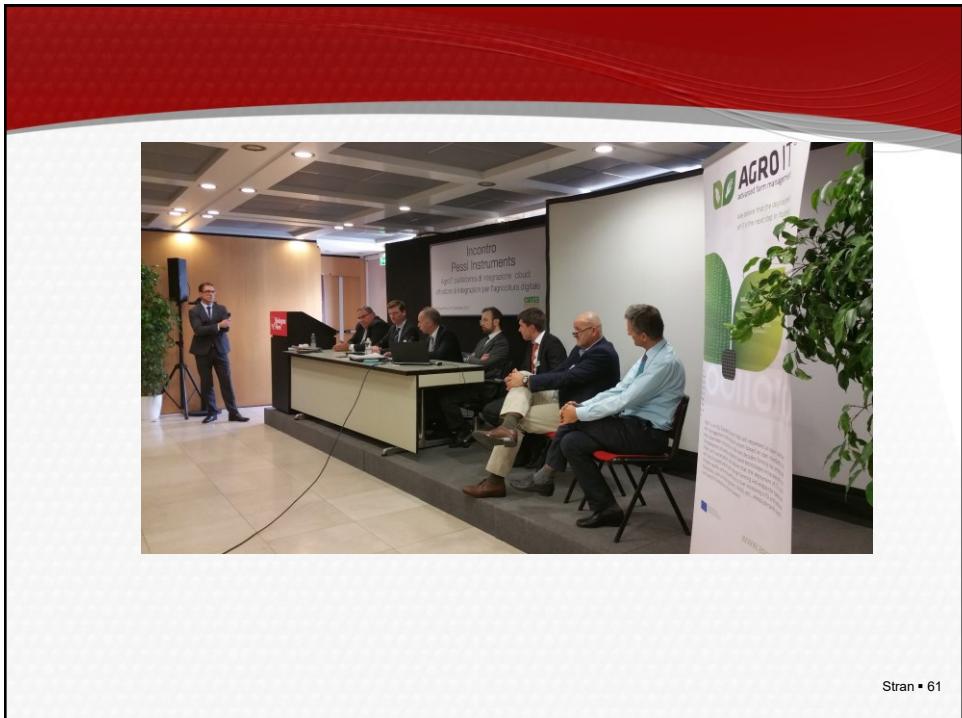


Stran • 59

Konferenca AgroIT



Stran • 60



Stran • 61