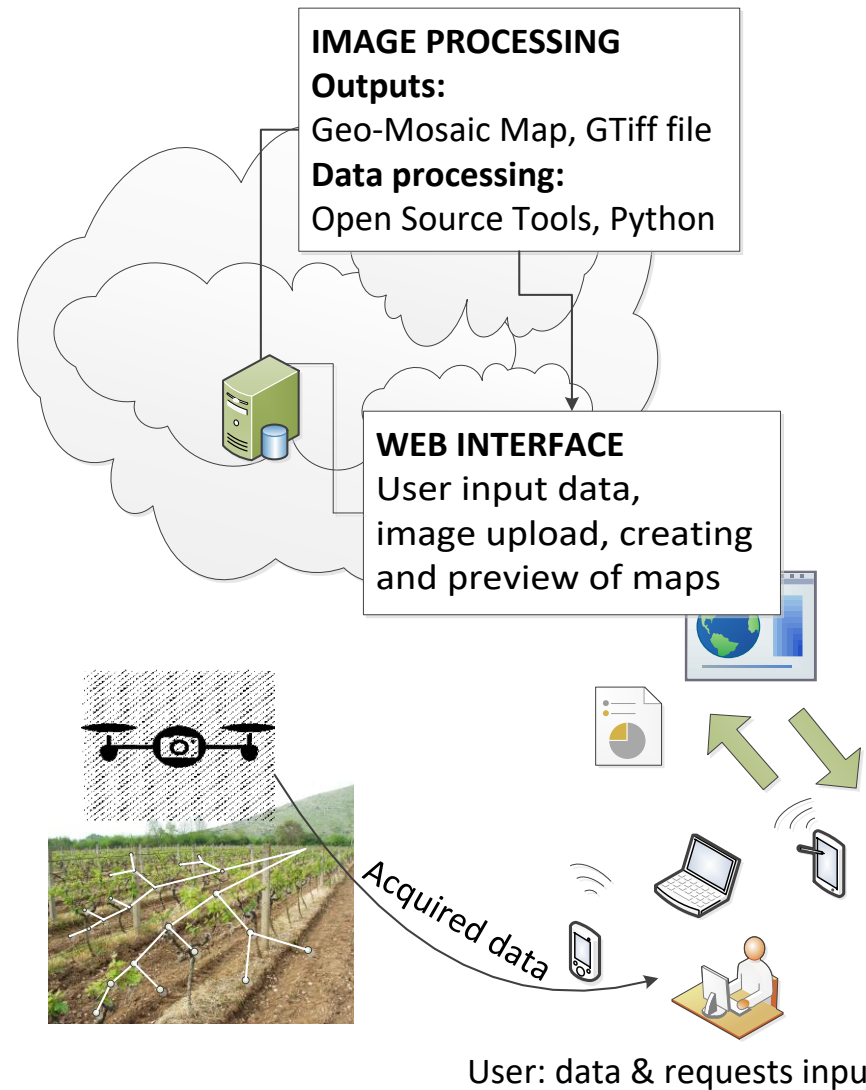# National Initiatives for Open Science in Europe

NI4OS activities in Montenegro: Planned thematic services

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OpenMApp

❑ Cloud application for automatic mosaicking and georeferencing in aerial mapping applications

❑ Simple, open source and gives enough information for ordinary user

❑ Application supports several users: each can upload a set of captured images via a web interface, begin processing and preview already created maps

❑ After processing, users receive an e-mail notification

❑ Combines many open source libraries:

    ❑ web interface: php + mysql, Leflet.js

    ❑ server side: OpenDroneMap, gdal libraries, python

OpenMApp

IMAGE PROCESSING
Outputs:
Geo-Mosaic Map, GTiff file
Data processing:
Open Source Tools, Python

WEB INTERFACE
User input data,
image upload, creating
and preview of maps

Acquired data

User: data & requests input

OpenMApp – potential applications

☐ Precision agriculture

    ☐ Crop classification and crop condition monitoring, soil moisture detection and chlorophyll level monitoring

☐ Cultural heritage digitalization

    ☐ 3D object reconstruction, mapping

☐ Environmental protection

    ☐ National parks and forests monitoring, plant and animal species detection

CULTURAL HERITAGE DIGITALIZATION
    PRECISE AGRICULTURE
    ENVIRONMENTAL PROTECTION

OpenMApp – potential applications

❑ Aerial color and spectral images provide spatial and spectrally derived terrain parameters that can be used in different applications

❑ Satellite - low spatial and spectral resolution and the large revisit time

❑ By plane - are detailed enough, too expensive, sometimes impractical

❑ Air vehicles (UAV)/Drones

    ❑ practical, potentially lower cost

    ❑ limited payload capacity > light-weight cameras are required

   ❑ frequent image updates, which enable close monitoring of crop development

OpenMApp vs other solutions

☐ Commercial standalone (AgiSoft PhotoScan) and cloud-based solutions (MapsMadeEasy)

Software	DroneMapper	MapsMadeEasy	PhotoScan
Number of images	180	180	180
Processing time	35min	5h 10min	8h 40min

| Software	DroneMapper	MapsMadeEasy	PhotoScan
Number of images	65	65	65
Processing time	10min 52 s	1h 10min	3h 20min

OpenMApp - example

- ❑ Test field of UoM BTF
- ❑ DJI Phantom 4
- ❑ 12.6Mpx camera

IoTP Cloud
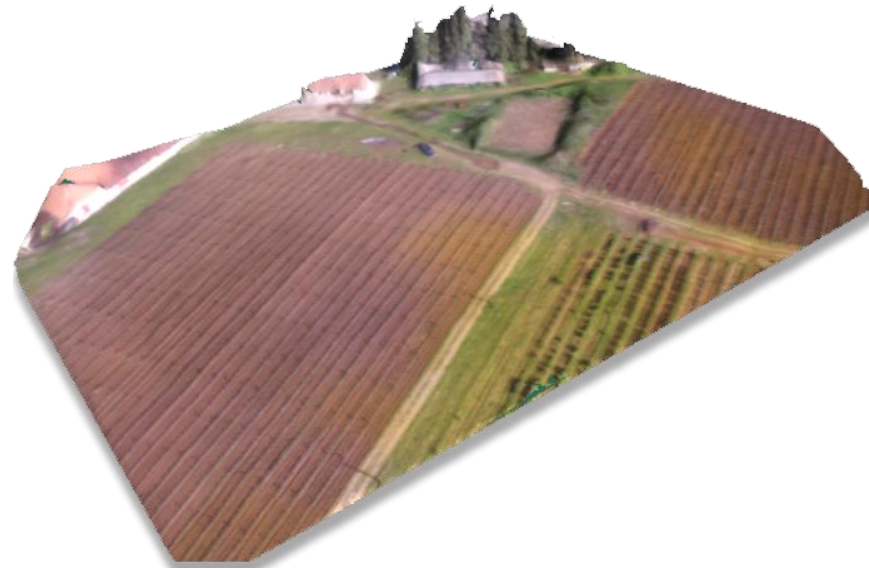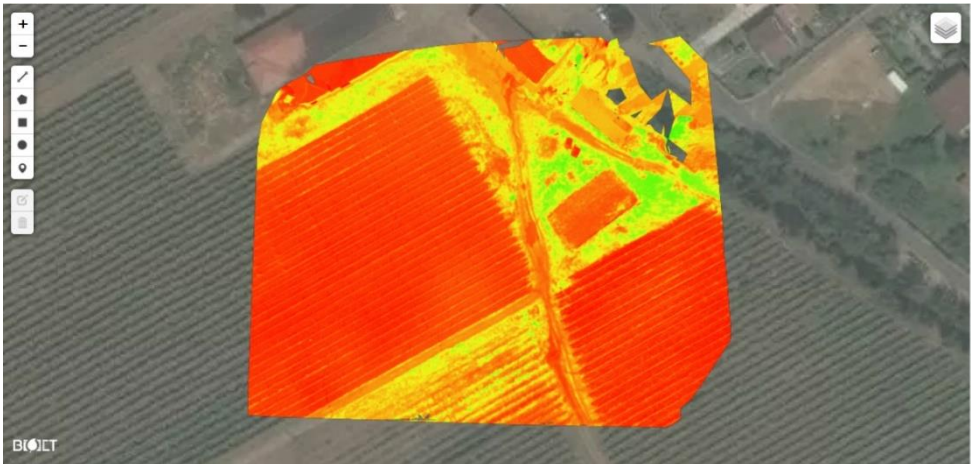
- Data collection from different type of devices (sensors, Arduino and Raspberry Pi platforms, mobile devices, PCs, etc.) and almost real-time visualisation (data charting)

- User has the option of creating personal account for better data management

- Platform allows data processing and analysis by using several open source state-of-the-art tools

Data collecting

Data analysis

Remote controlling

Alarming

IoTP Cloud – Data visualisation

IoTP Cloud
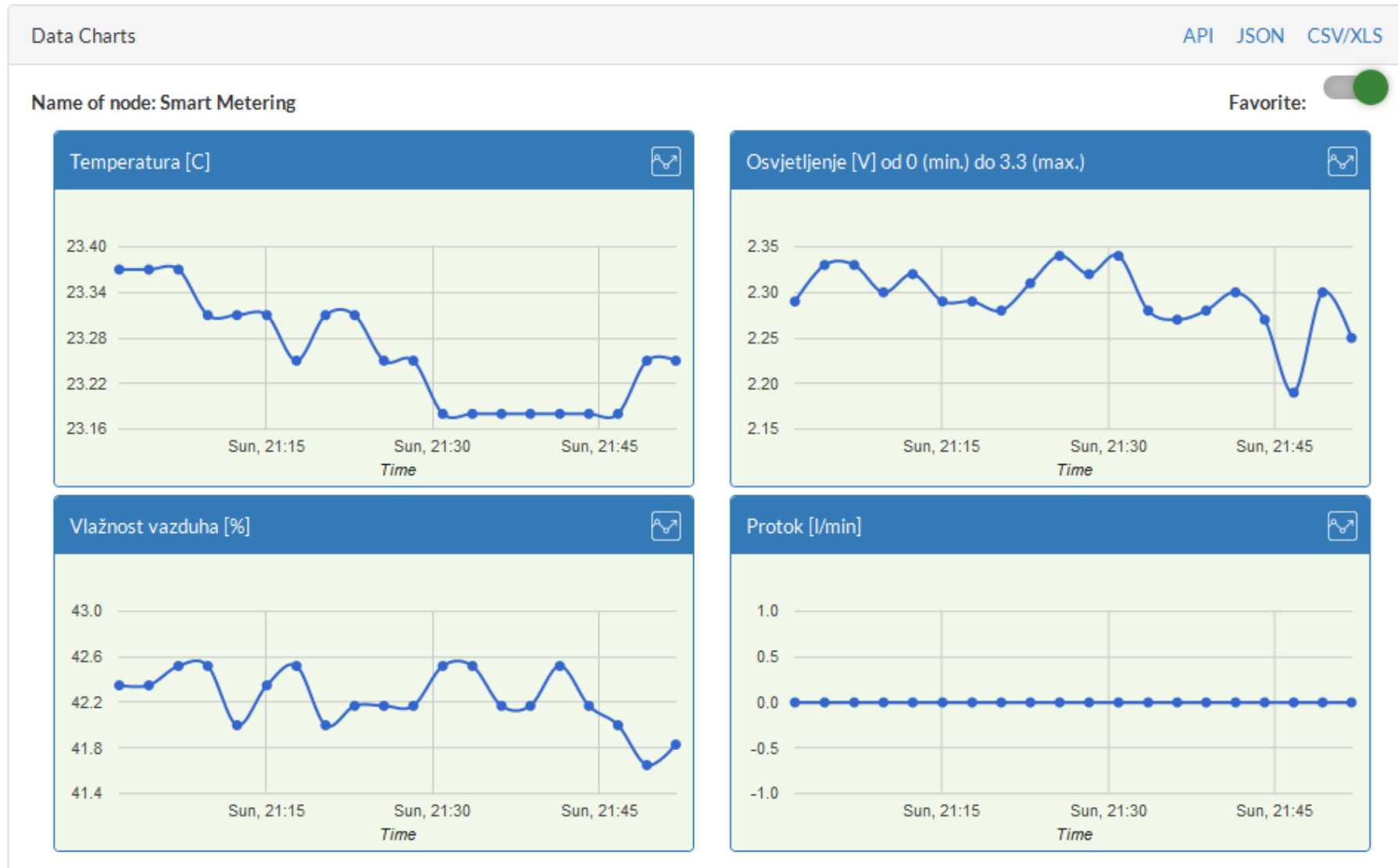
❑ Users could utilize either a pre-written algorithm or develop a new one directly on the web platform to obtain desired result from the collected data

IoTP Cloud - Remote control

Manual command execution

Periodic command execution

Periodic algorithm execution

Algorithm execution based on sensor data

Thanks!

for OPEN SCIENCE Cloud

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