

# No-InMUD



BALTIC  
SAT  
APPS

- *Save equipment, save money, save nerves, do not lose your clients.*
- *Sat data system integrated with original solution 3D Path Designer for Directional Drilling Trajectory Optimization.*
- *HiTech solutions for transport in uninhabited risky muddy terrains.*



# Boosting your business with open satellite data

BALTIC  
SAT  
APPS



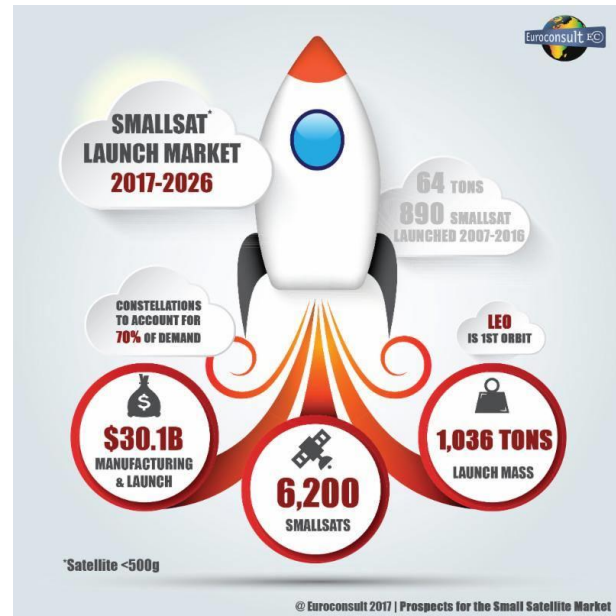
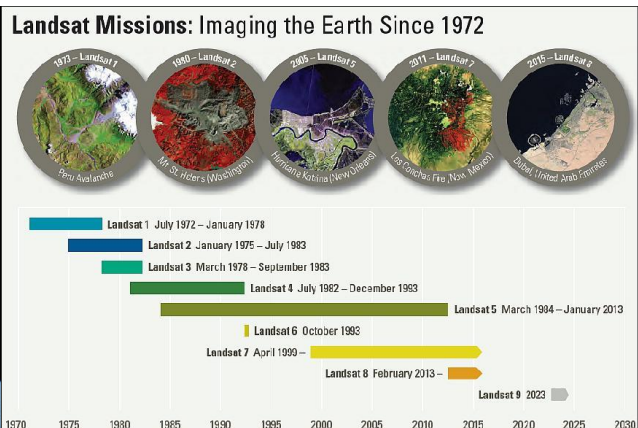
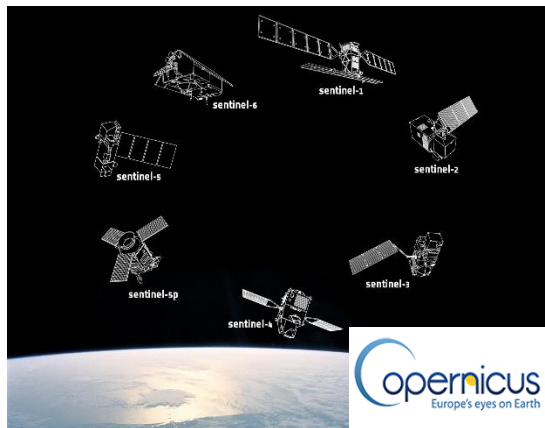


# Solution from the sky



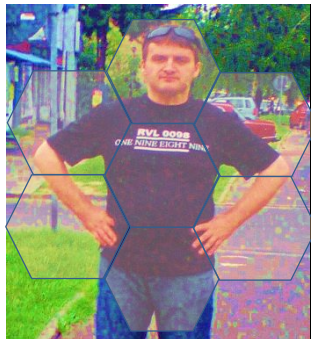
BALTIC  
SAT  
APPS

# Introduction





# Team: NewHorizonSat00



EDUCATION

## PH.D. ENG. ADAM JAN ZWIERZYŃSKI

- 2006 M.Sc. Eng. : Control Engineering (Robotics and Mechatronics) – AGH
- 2013 M.Sc. : Physics - Jagiellonian University
- 2011 Ph.D. Medical Robotics – AGH



EDUCATION

## PH.D. ENG. KRZYSZTOF SKRZYPASZEK

- 2001 M.Sc. Eng. : Drilling- AGH
- 2010 Ph.D. : Computer Aided Design for Drilling, Oil and Gas Tech – AGH

HOBBIES & EXTRA INTERESTS

- Technology
- Internet
- Traveling
- Night life
- Likes Russia and Ukraine
- Vegetarian since 1st June 2015
- Goa & Psy-Trance Music
- Sauna lover

USEFULL SKILLS

- Analytical thinking
- Creative mind
- Space technology fan
- Business thinking
- Strong motivation and of space mission sense
- Interested in space technology since 2012
- Interested in space mining
- Strong motivation to make space mining business and space business
- Attend project management post graduate study

HOBBIES & EXTRA INTERESTS

- Technology
- Internet
- Programming
- Retro programming
- Internet Security

USEFULL SKILLS

- Analytical thinking
- Creative mind
- Astronomy
- Physics
- Rheology
- Drilling
- IT Specialist

# Problem



Rain is cool ... :-)



Mud is cool ... :-)

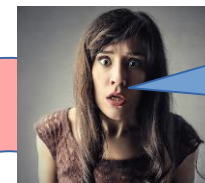


# Problem

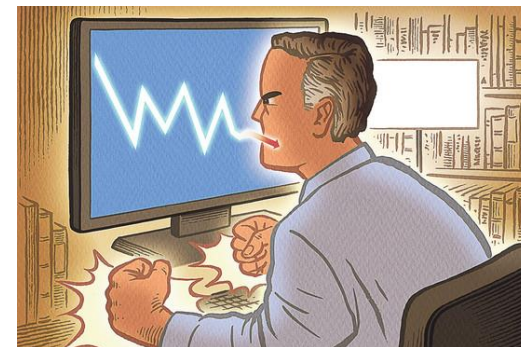
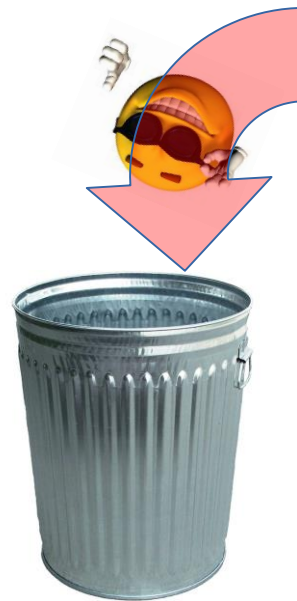


Mud is cool? Really ... ???

**BALTIC  
SAT  
APPS**



*Boss a few really bad news ...  
Remember about your blood pressure ...*



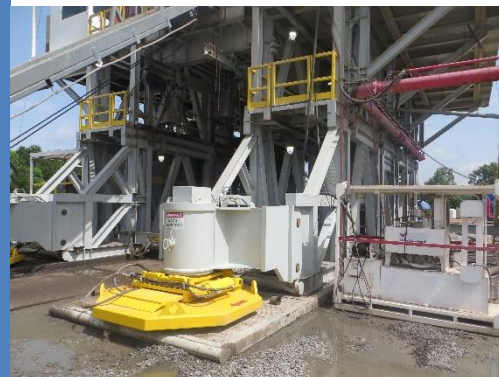
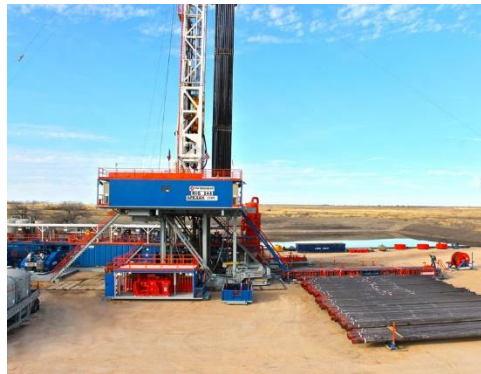


# Problems



verifying that the ground is not washed by the escaping drilling mud.

Customer:  
Drilling companies



2019-04-27

Ground checking for walking rigs

Customer:  
Drilling companies

Ph.D Eng. Adam Jan Zwierzyński  
Ph.D. Eng. Krzysztof Skrzypaszek





# Problems



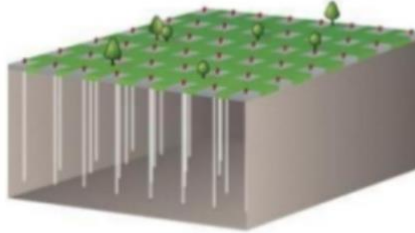
Customer:  
Drilling companies

# Problems: drilling rig positions problems

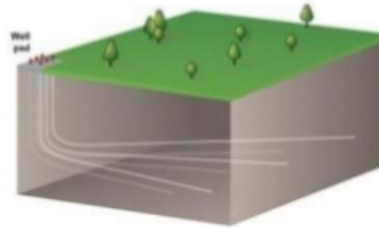


## Multi-Well Pads

Vertical Well Pad



Horizontal Well Pad



Source: ERCB 2011

### Advantages of Multi-Well Pads:

- Reduction of land use for the pad, access roads & pipelines.
- Easier monitoring of site and enforcement of regulations.
- Conducive to establishing and enforce traffic/trucking corridors.
- Optimization of location.
- Establish and enforce noise, light, air emission and water plans.

Customer:  
Drilling companies



# Problems: drilling rig positions problems



The screenshot displays the PATH DESIGNER 3D software interface. On the left, a sidebar contains the user profile for Krzysztof Skrzypaszek and a list of projects under 'STUDENTS: ALL', including 'Multi Well Pad Trajectories' with a sub-entry for 'Standard Pad'. The main area shows a 3D perspective view of well trajectories, with a top navigation bar indicating 'Site basic info' and '2D/3D view'. The trajectories are represented by multiple colored lines (green, blue, purple, red, orange) that originate from a central point and fan out horizontally, illustrating the layout of a multi-well pad.

Customer:  
Drilling companies

# Problems



Individual trip planning

CUSTOMER:  
Individual user



Transport robot path planning

CUSTOMER:  
Companies

Terrain route planning with GPS navigation supported by sat data  
(Anty Mud Navigation)



CUSTOMER:  
Individual user



Soldiers marsh planning

CUSTOMER:  
Army



Car services – route planning to customer

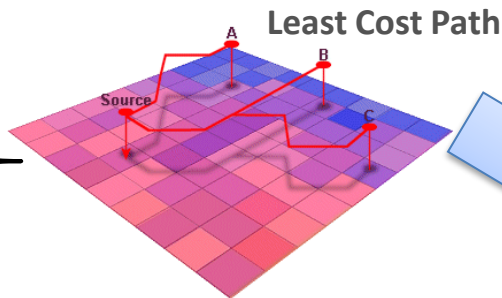
CUSTOMER:  
Companies (SME)



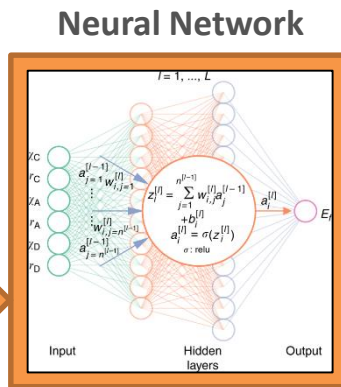


# Solution

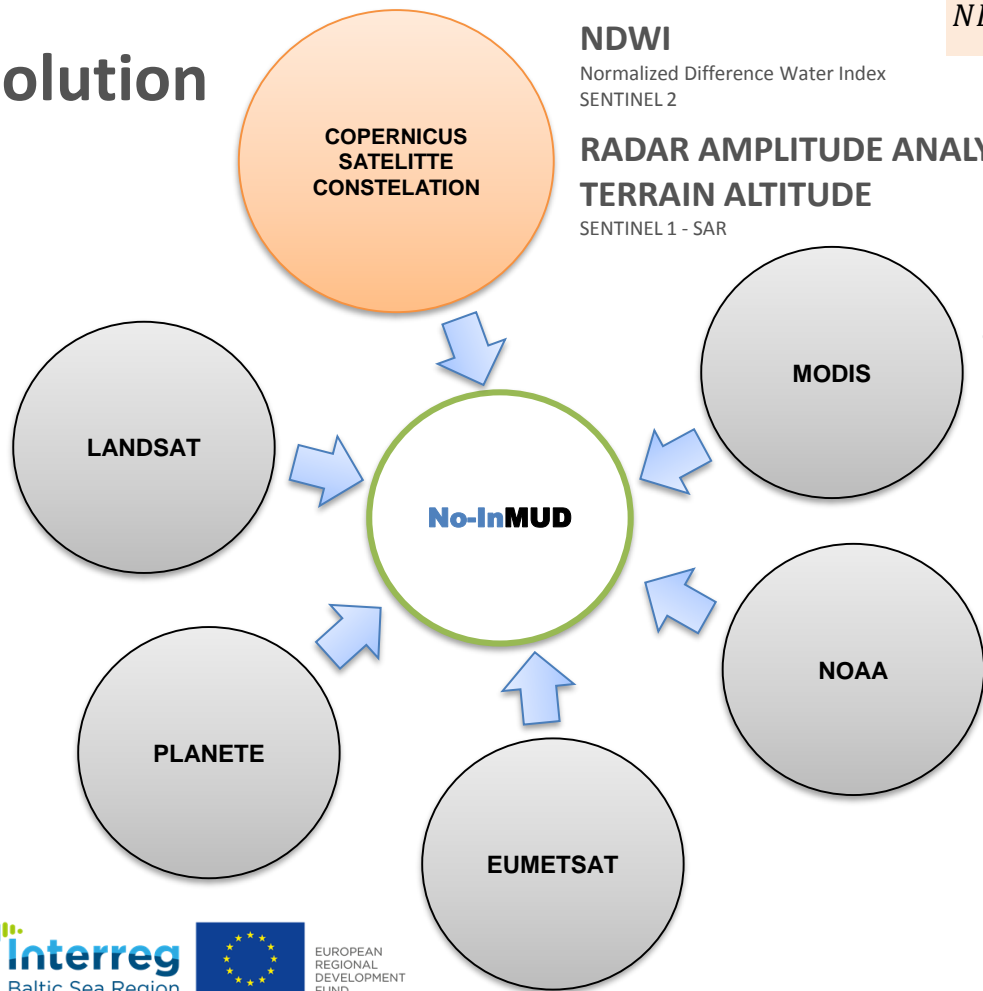
- 1 Soil moisture (Wigotność gleby)
- 2 Terrain altitude (Wysokość terenu)
- Vegetation type (Typ roślinności)
- Plant condition - dry (Kondycja roślin - suchość)
- 3 Subsidence of soil (Osiadanie gleby)
- Soil Type (Typ gleby)
- 4 Soil composition (Skład gleby)
- Snow (Śnieg)
- Water flow (Przepływ wody)
- 5 Weather forecast (Prognoza pogody)



Special Tools



# Solution



**NDWI**  
Normalized Difference Water Index  
SENTINEL 2

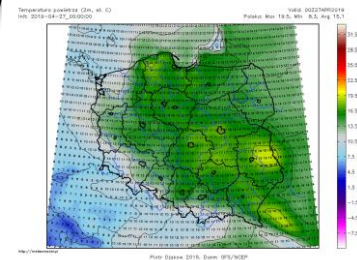
$$NDWI = \frac{X_{NIR} - X_{SWIR}}{X_{NIR} + X_{SWIR}}$$

$$NDWI = \frac{X_{GREEN} - X_{NIR}}{X_{GREEN} + X_{NIR}}$$

**RADAR AMPLITUDE ANALYSIS**  
**TERRAIN ALTITUDE**  
SENTINEL 1 - SAR

**SNOW COVER**  
**LAND SURFACE TEMPERATURE (MOD11 & MOD12)**  
**EVAPOTRANSPIRATION**

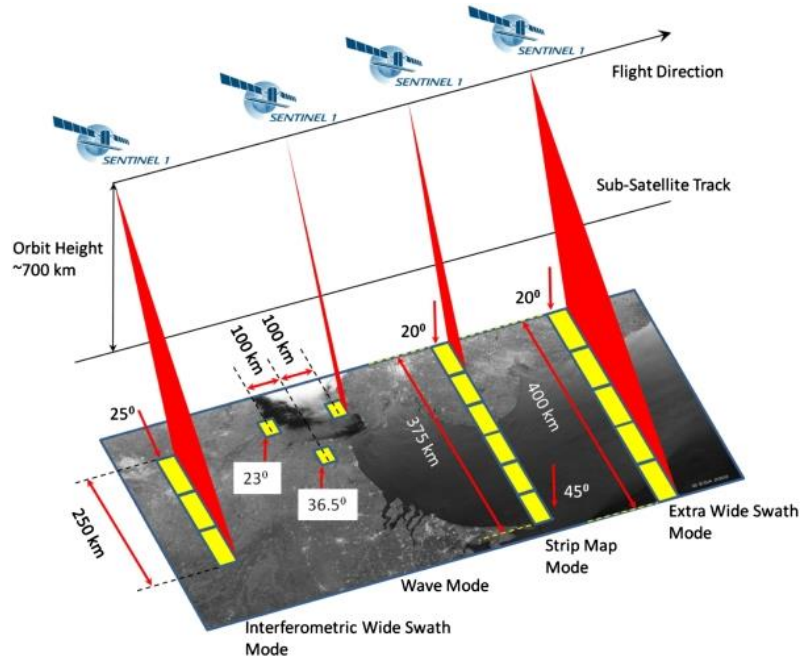
**GFS**  
Global Forecast System by NOAA  
run 4 times on 24h. It is short  
time weather forecast for world



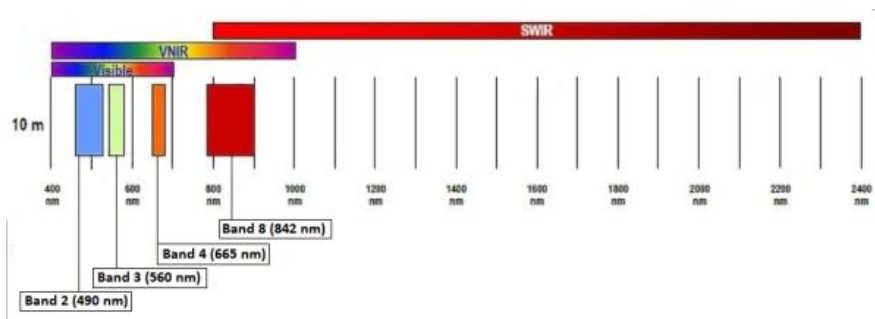


# Solution

Sentinel 1 – SAR

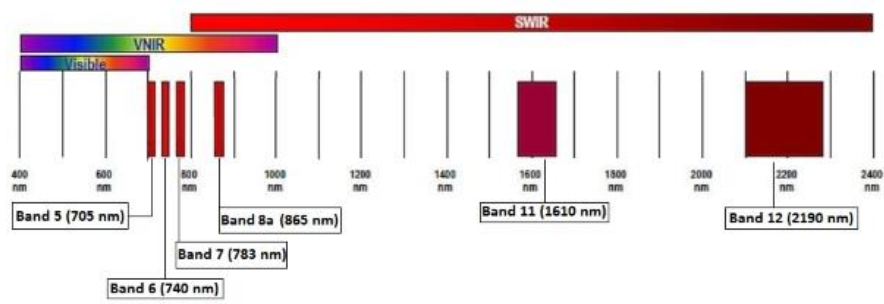


# Solution



Sentinel 2 – Bands 10m

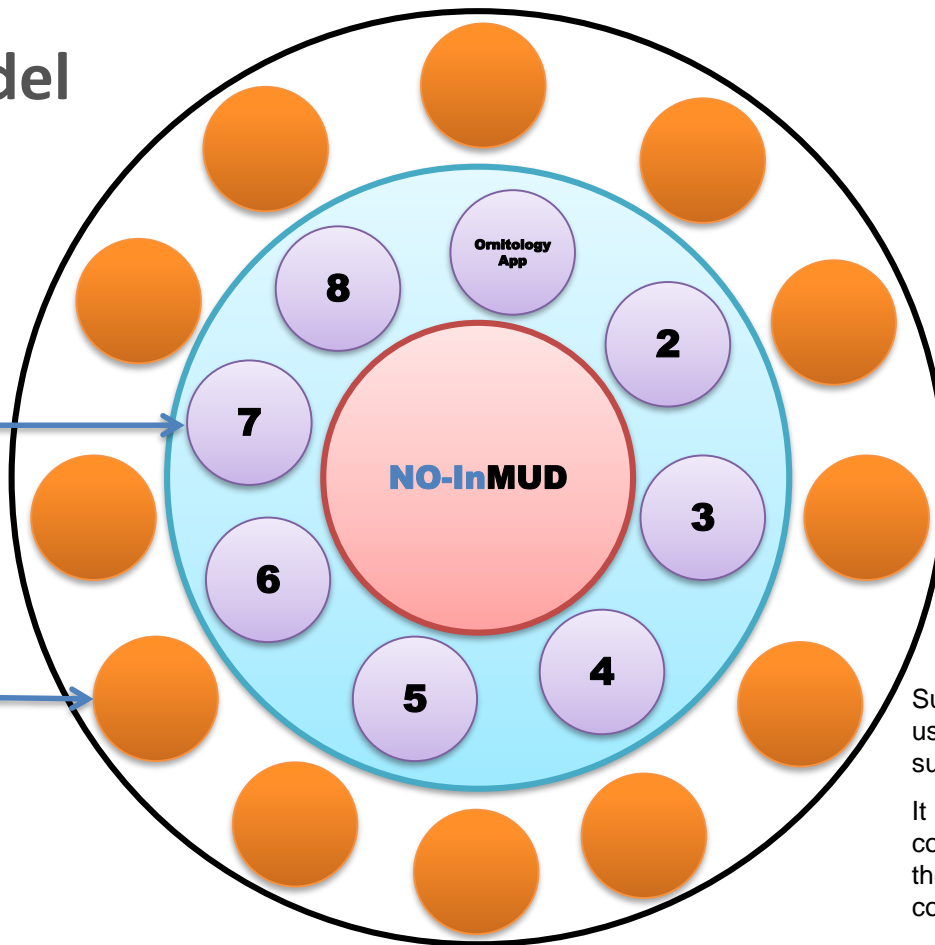
$$NDWI = \frac{X_{NIR} - X_{SWIR}}{X_{NIR} + X_{SWIR}}$$



Sentinel 2 – Bands 20m

Sentinel 2 - Bands

# Business Model



No-Commercial Services/Projects

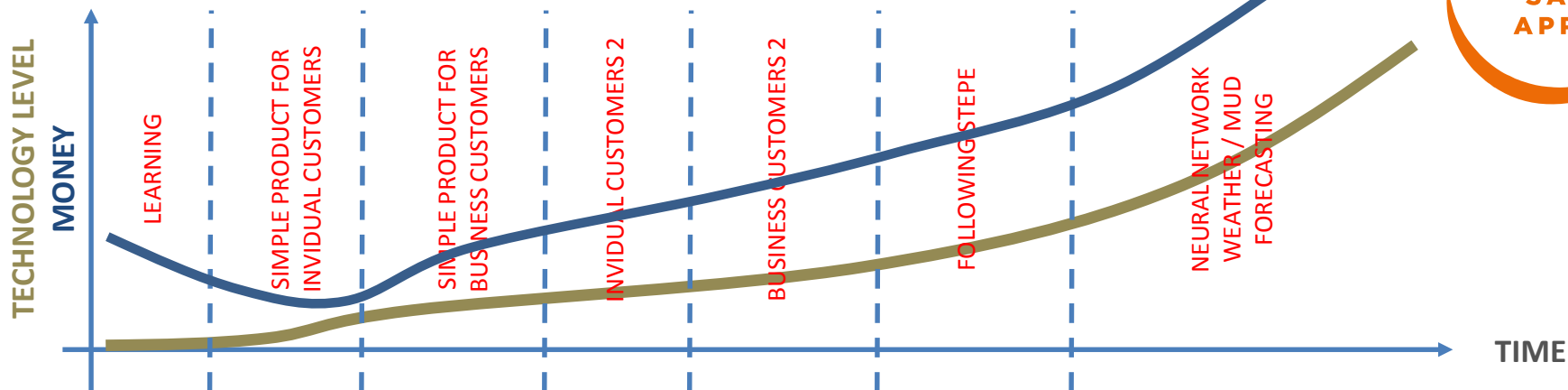
Future Spin-off Services/Projects

Supporting non-commercial, socially useful projects is an incentive for subsidies.

It is also a marketing argument for commercial clients who can present themselves as socially engaged companies.

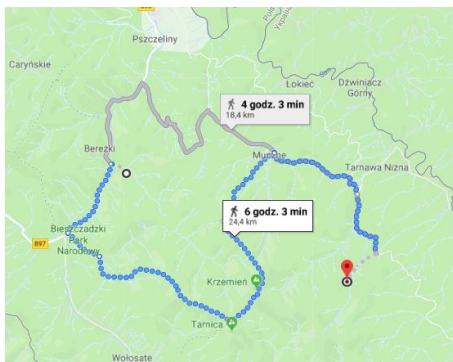


# Business Model



# Business Model

## INDIVIDUAL CUSTOMER - SIMPLE CASE (BASIC PRODUCT)



**FREE SERVICE\***  
\* - only basic service

- Route difficulties information
- Estimated Trip Time
- Chance that you will come back dirty
- Warnings

### EARN

**25% for no-commercial services, 75% for No-InMUD**

- Advertisement (e.g. Trekking shoes)
- Utilizing object advertisement on maps (earn when client click on object link)

**75% for non-commercial services, 25% for No-InMUD**

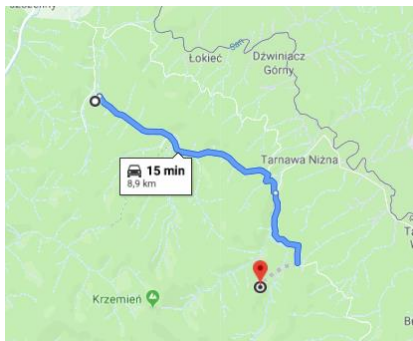
- Customer dotations

- Weigth
- Age / Physical parameters

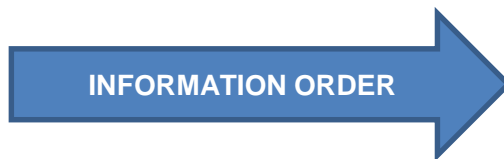
Supporting non-commercial, socially useful projects is an incentive for subsidies. It is also a marketing argument for commercial clients who can present themselves as socially engaged companies.

# Business Model

## BUSINESS CUSTOMER (BASIC CASE)



- Fleet definition (truck numbers)
- Truck mass
- Engine power
- Engine oil burning parameter



**PYMENT**

**25% for no-commercial services,  
75% for No-InMUD**

**Client choose which non-commercial  
service support (80% and 20% for  
other).**

- Optimal route selection
- Route difficulties information
- Route navigation with Gallileo, GPS, Glonas, ...
- Route estimated cost
- Tanking points (where will be necessary to tank)
- Estimated Transport Time
- Warnings

Supporting non-commercial, socially useful projects is an incentive for subsidies. It is also a marketing argument for commercial clients who can present themselves as socially engaged companies.



# Business Model

## BUSINESS CUSTOMER (NO ROUTE SPECIAL SERVICES FOR OIL INDUSTRY)



Investments in the drilling industry are very expensive. using:

- tools developed in the project for the analysis of the area,
- applied to small areas,
- based on data from high-resolution commercial satellites

It is possible to offer a drilling rig a number of specific services for a specific customer that will be very profitable.

For example, it is possible to assess where it will be optimal to locate subsequent drilling pads (stability issues)

**25% for no-commercial services, 75% for No-InMUD**

**Client choose which non-commercial service support (80% and 20% for other).**

Supporting non-commercial, socially useful projects is an incentive for subsidies. It is also a marketing argument for commercial clients who can present themselves as socially engaged companies.

# Contact



**PH.D. ENG. ADAM JAN  
ZWIERZYŃSKI**

**zwierzyn@agh.edu.pl**

**+48 606 714 174**



**PH.D. ENG. KRZYSZTOF  
SKRZYPASZEK**

**krzysztof@skrzypaszek.pl**



# Thank you!

