



# CENER

ADItch

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## Making standards easier

Data conversion workflow and tools

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Pawel Gancarski

CENER

Marinet2 data workshop, 23 June 2020



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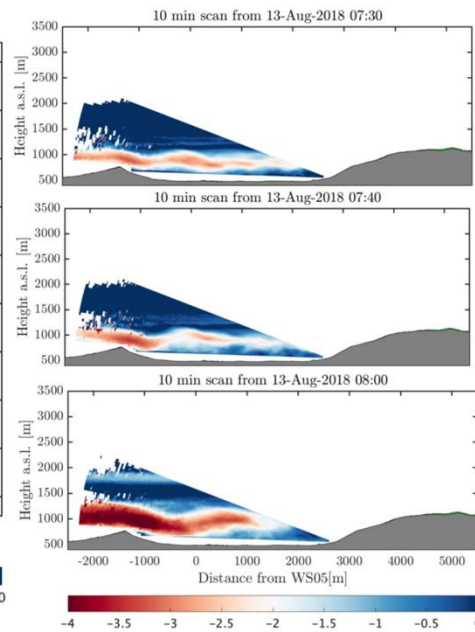
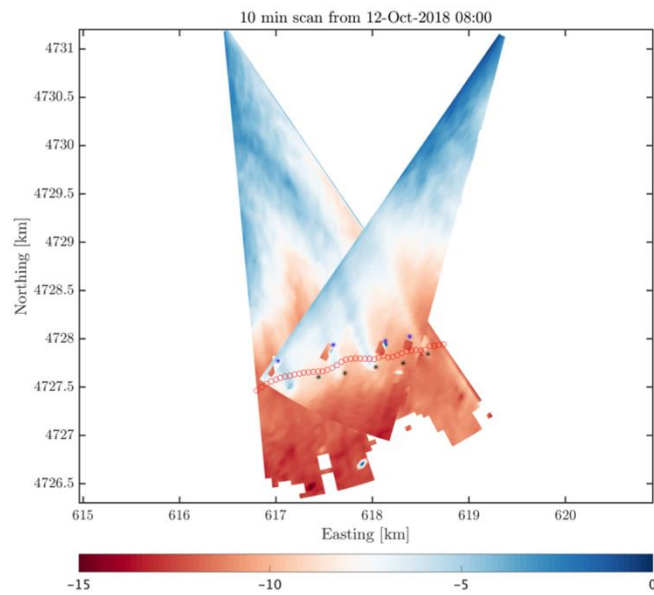
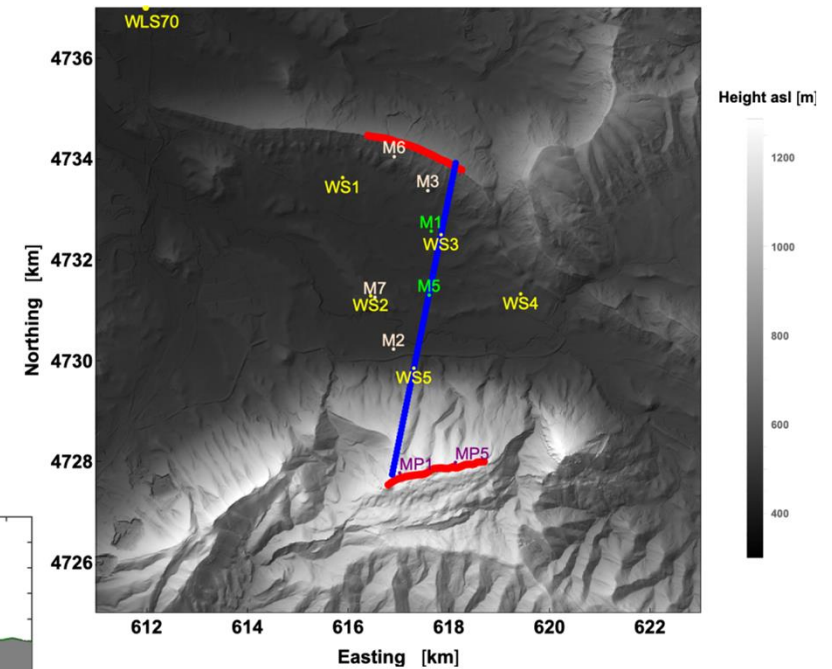


**CONTEXT**

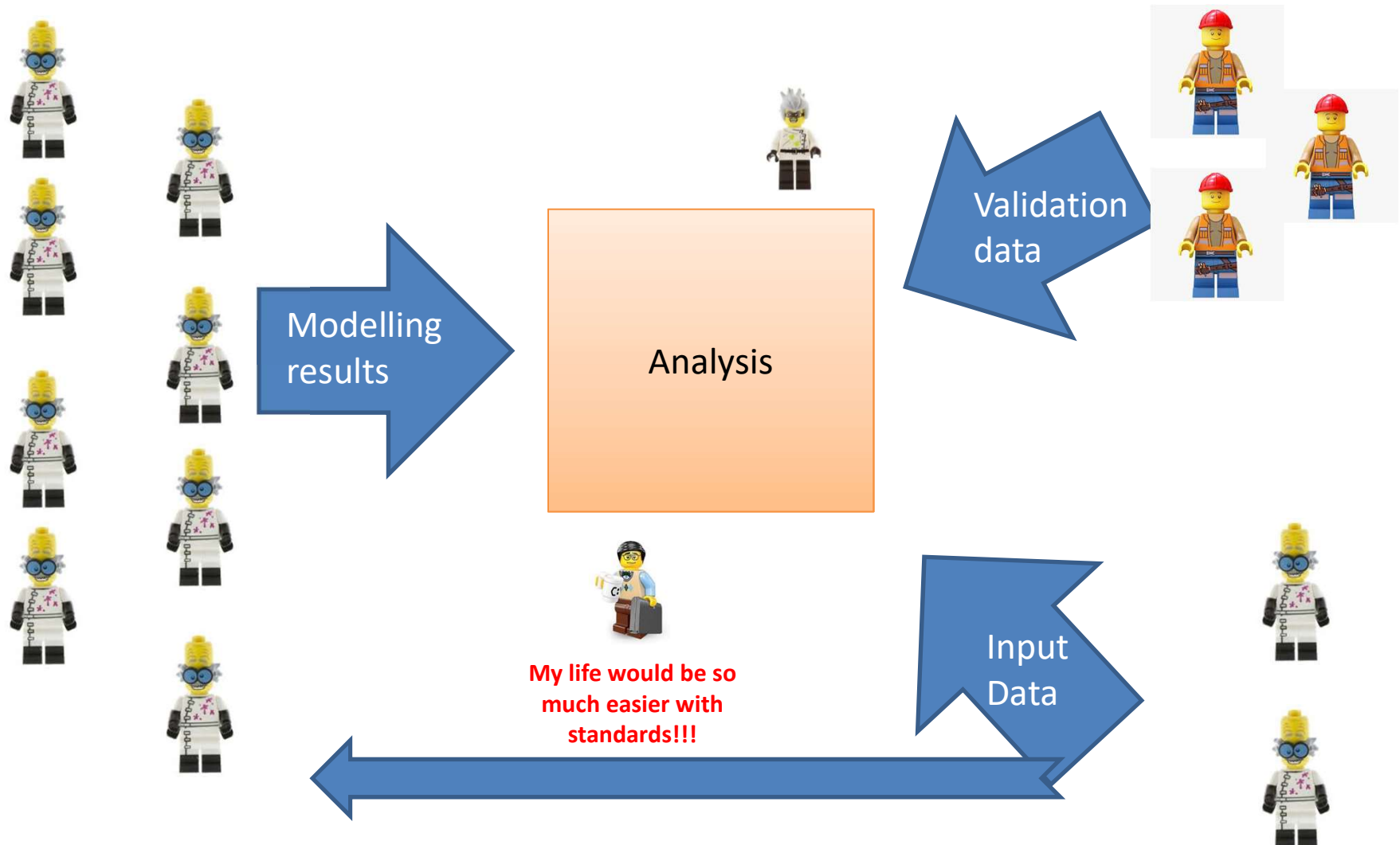
# Context – models benchmarking

- IEA-Wind **Task 31** Wakebench. **Wake models**
- **IRPWind** WP6.2 benchmarking of **floating wind turbines** design codes.
- **OWA** wake modelling challenge, 5 **offshore** wind farms.
- New European Wind Atlas, **ALEX17** measurement campaign. **Complex terrain**, meso-micro scale phenomena, diurnal cycles.

# Use case – ALEX17



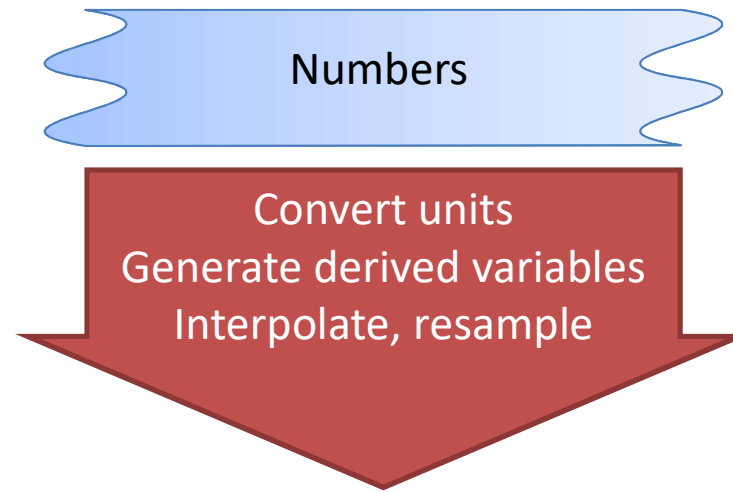
# Context – models benchmarking



Creating standardised file

# **WORKFLOW**

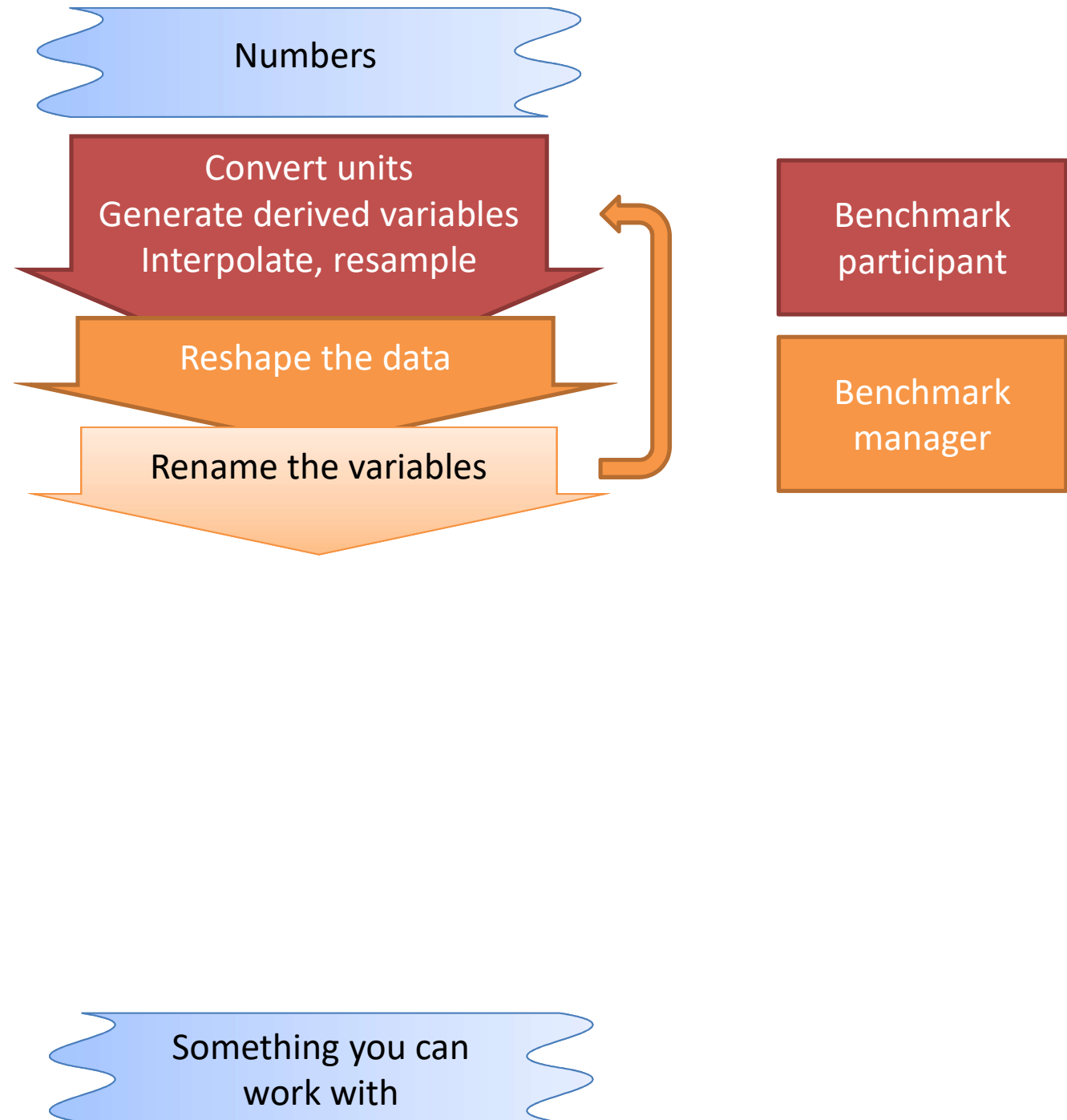
Working on  
data – the  
hard way



Benchmark  
participant

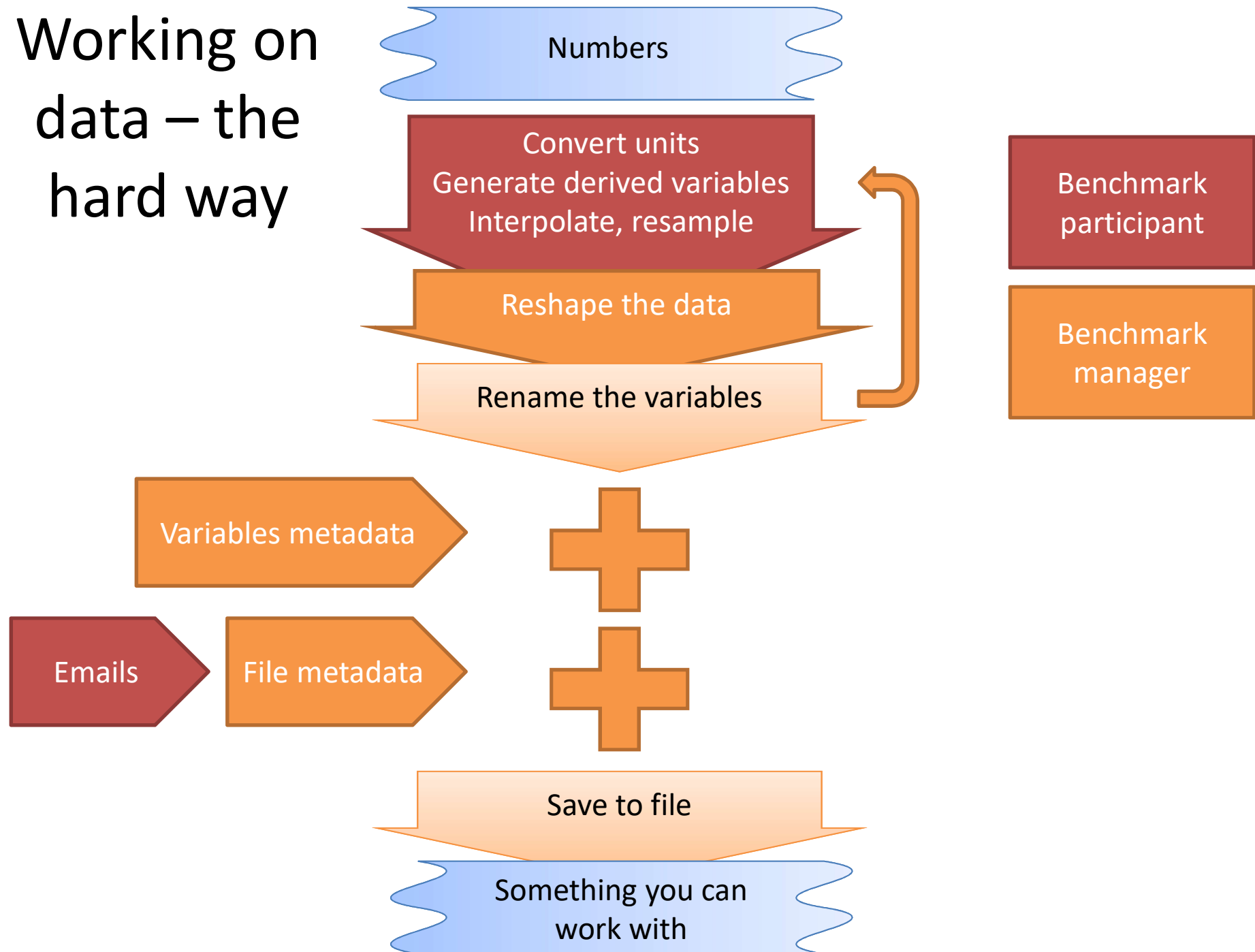
Something you can  
work with

# Working on data – the hard way

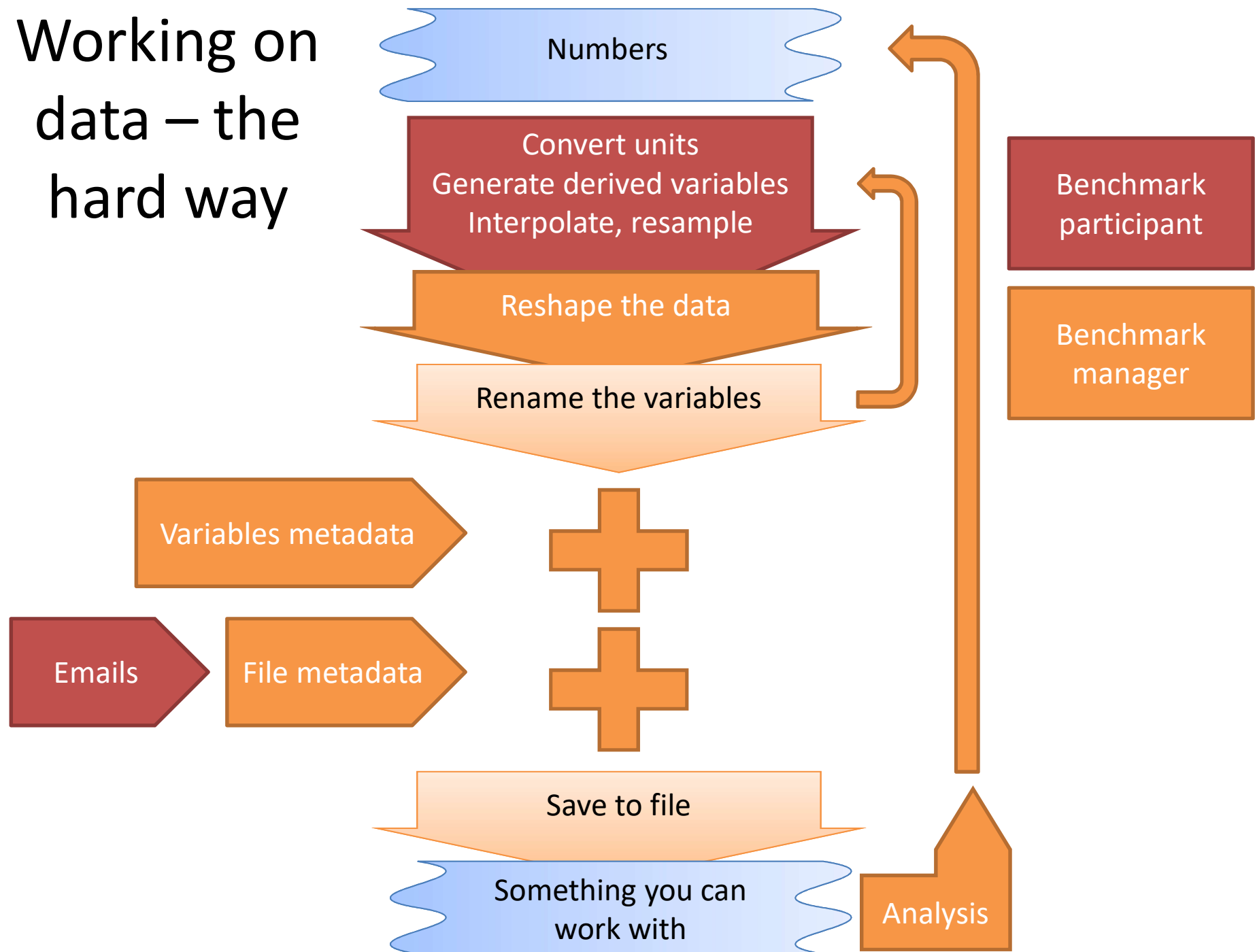




# Working on data – the hard way



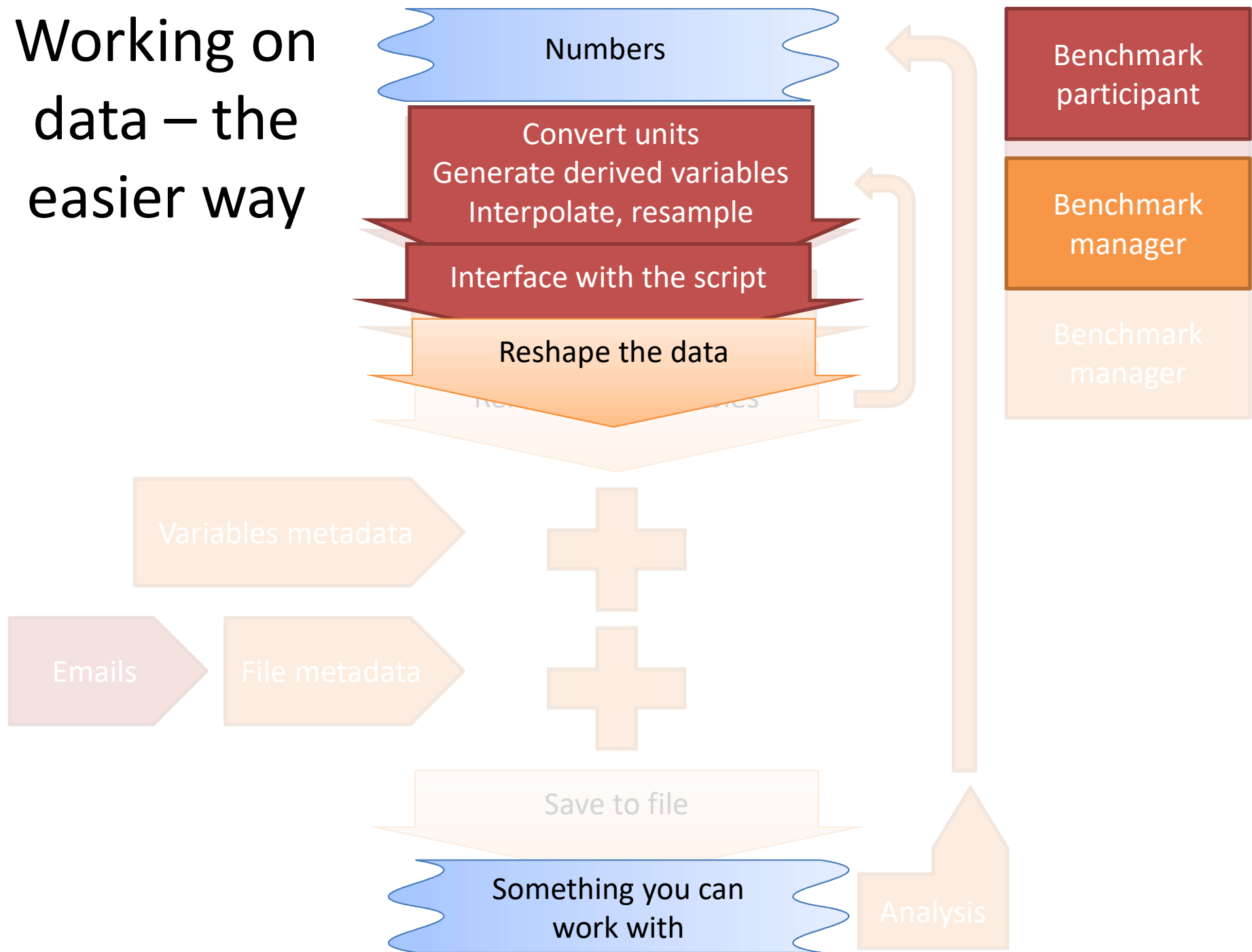
# Working on data – the hard way



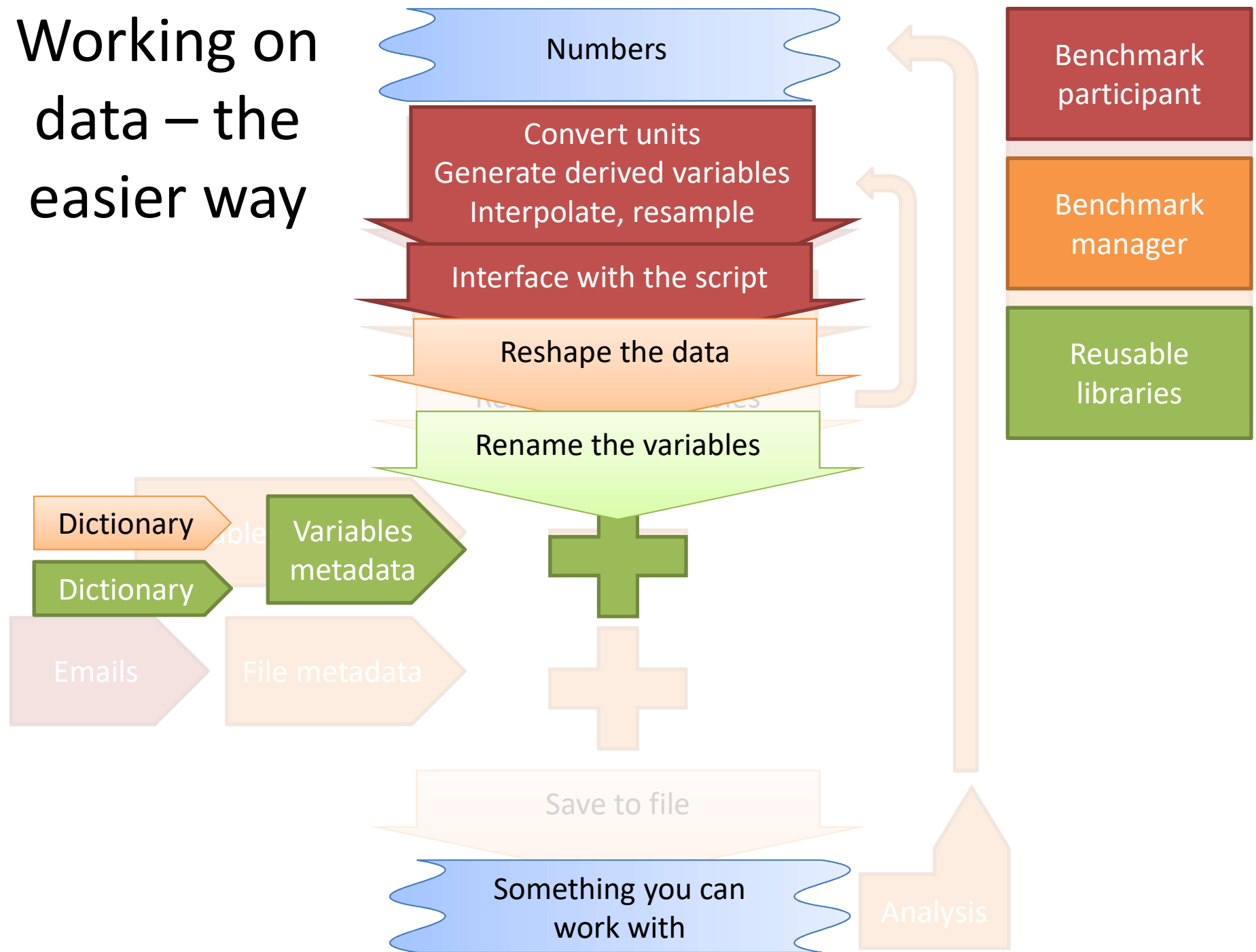
# What goes wrong?

- Implementing standards is
  - Boring (a big issue with scientists)
  - Time consuming
- It results in
  - Long term time/cost efficiency
  - Efficiency of funding
  - But, who cares if you have deadlines???

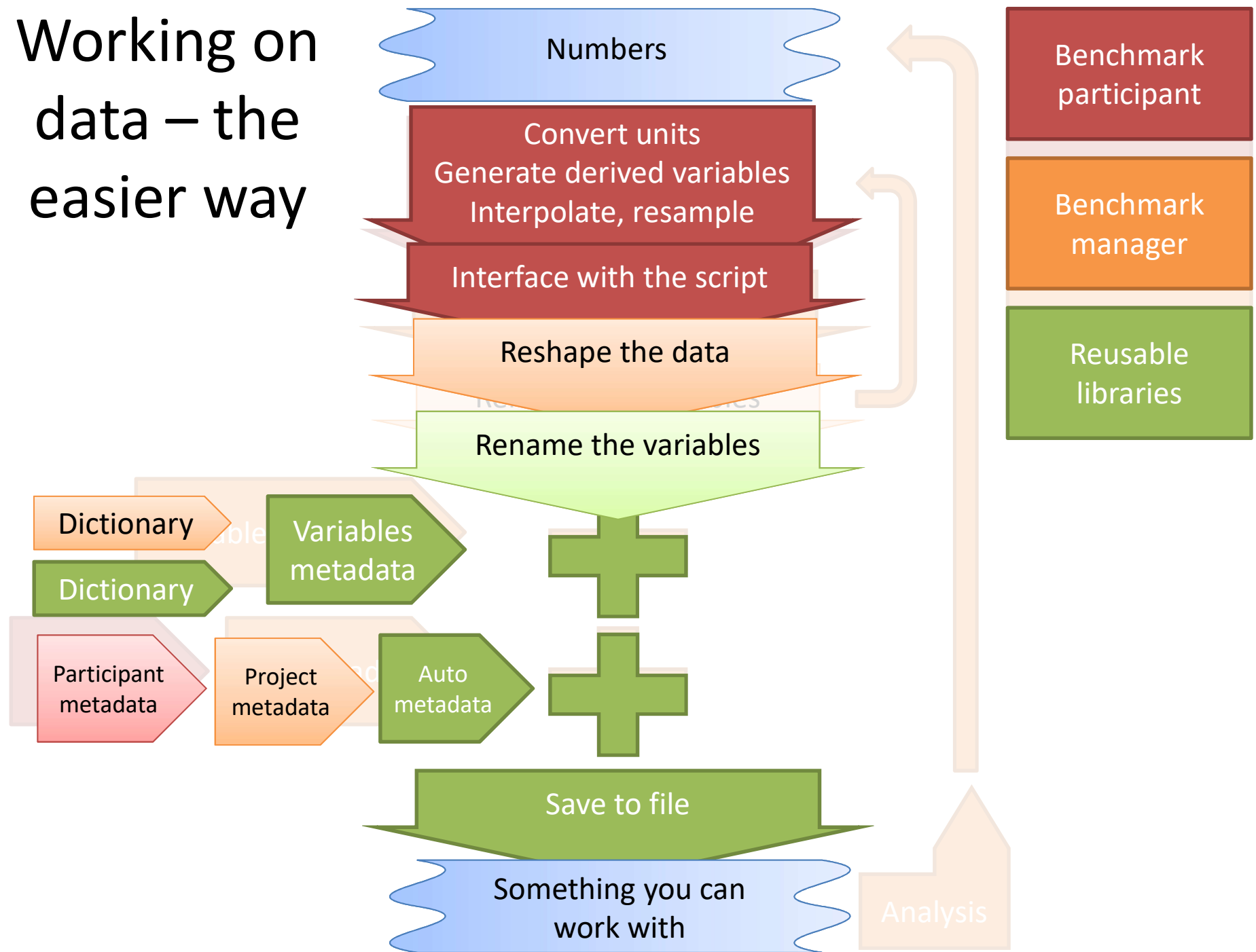
# Working on data – the easier way



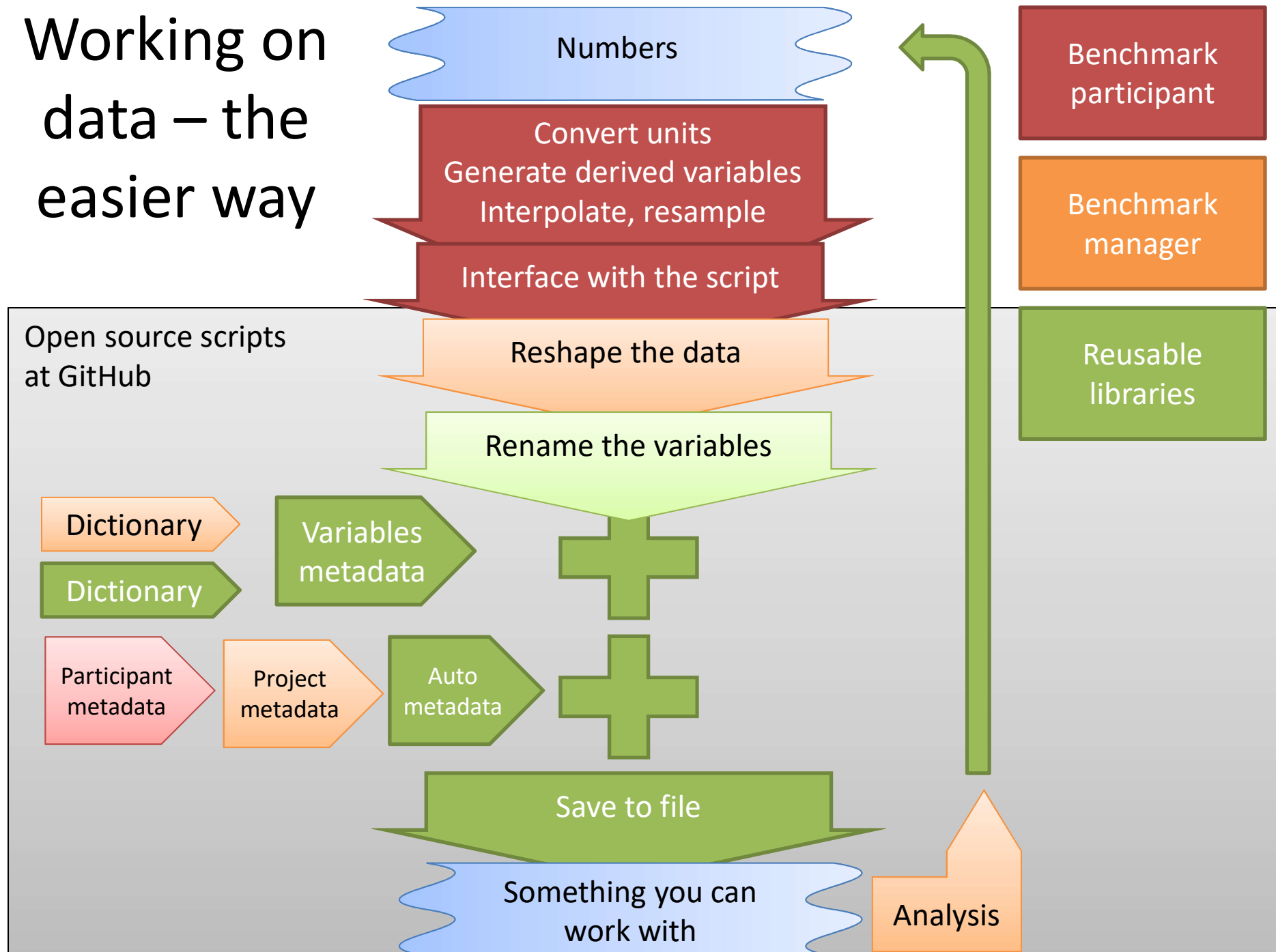
# Working on data – the easier way



# Working on data – the easier way



# Working on data – the easier way



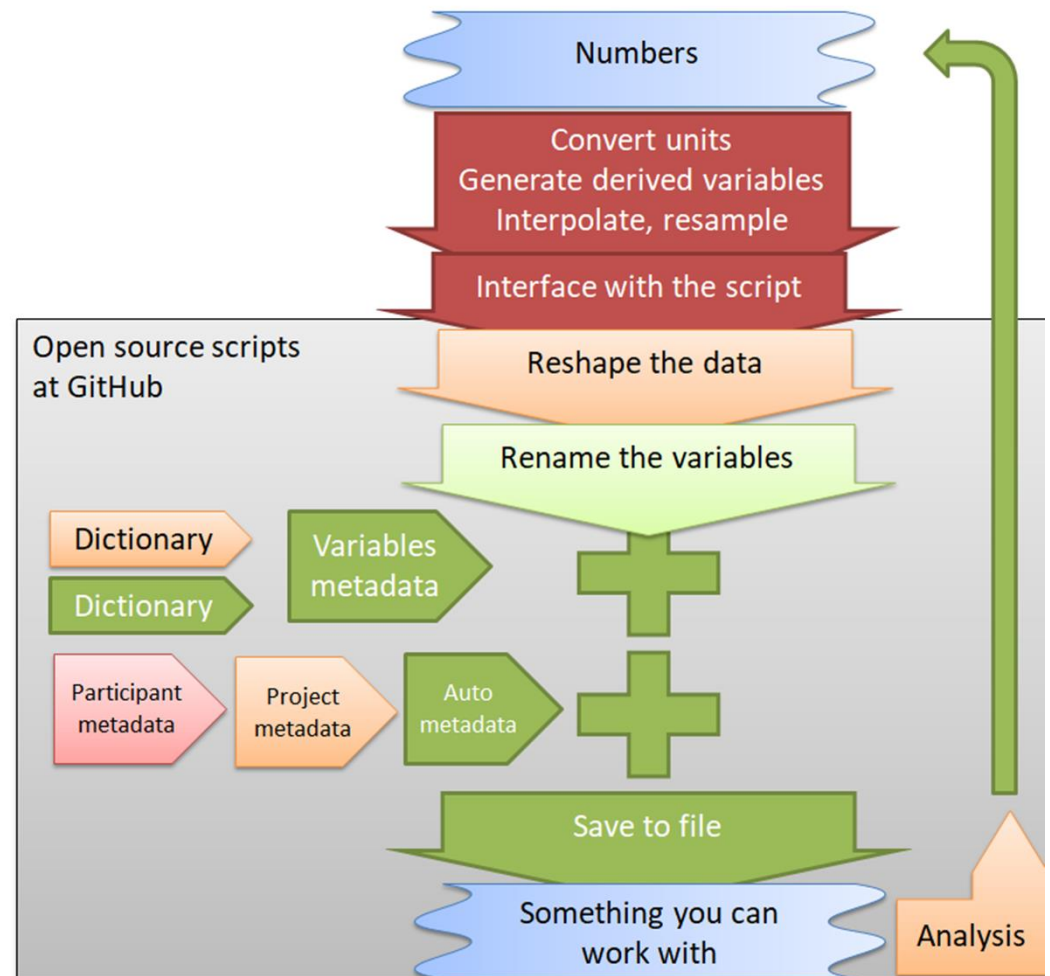
# **CONCLUSIONS**



# Conclusions

— We can help

- We can do
- You will do (with our support)
- Project participants will do



# Useful links

- The variables dictionary
  - <https://github.com/wind-energy/variables-dictionary>
- Open source Jupyter notebooks
  - tools for compatible data, standardising data analysis, building trust for scientific results)
  - <https://github.com/CENER-EPR/OWAbench>
  - <https://github.com/iat-cener/alex17>
- Marinet2 standard
  - <https://github.com/Marinet2/metadata-schema>
- Taxonomies for WE data
  - Data findability
  - <https://github.com/wind-energy/taxonomies-and-vocabularies>

[www.cener.com](http://www.cener.com)



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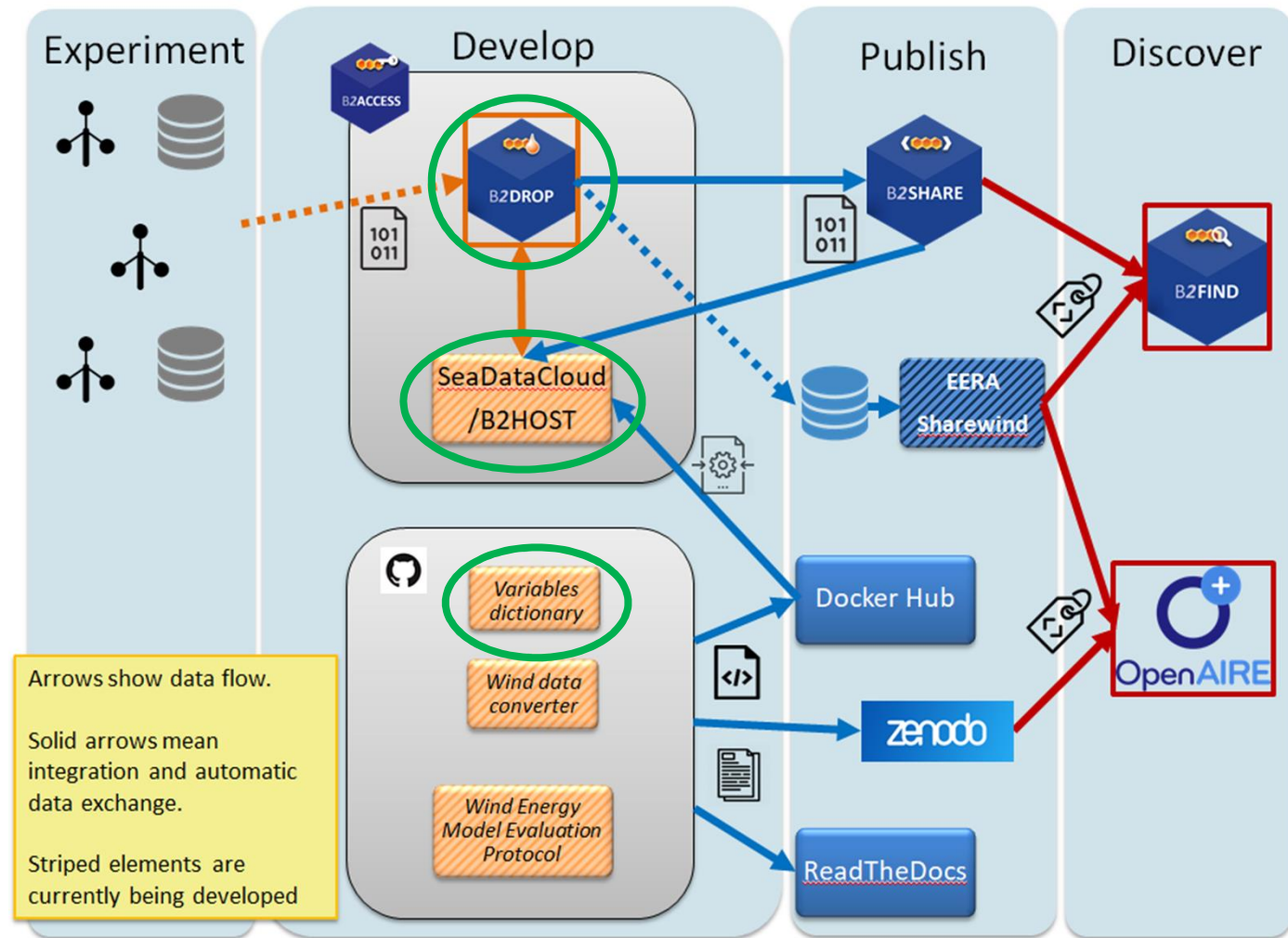
# Context - Workflows

Data standards and documentation are not supported if it implies additional work.



Provide tools\*  
and  
Focus on **workflows**

\*Tools should be useful.



Variables dictionary integration with the EOSC

# EXAMPLE TOOL

# Variables dictionary

```
22
23 {
24   "name": {
25     "default": "wind_speed",
26     "cf": "wind_speed",
27     "open_oa": "windspeed_ms",
28     "iec_61400-25": "MetAlt1HorWdSpd",
29     "e-WindLidar": "",
30     "grib": "31",
31     "other": [
32       "ws",
33       "wind speed"
34     ]
35   },
36   "description": "Speed is the magnitude of velocity. Wind is defined as a two-dimensional (horizontal) air velocity vector, w",
37   "units": "m s-1",
38   "ref": {
39     "nvs": "http://vocab.nerc.ac.uk/collection/P07/current/CFSN0038/"
40   },
41   "netcdf": {
42     "var_type": "float",
43     "other": ""
44   }
45 },
46
```

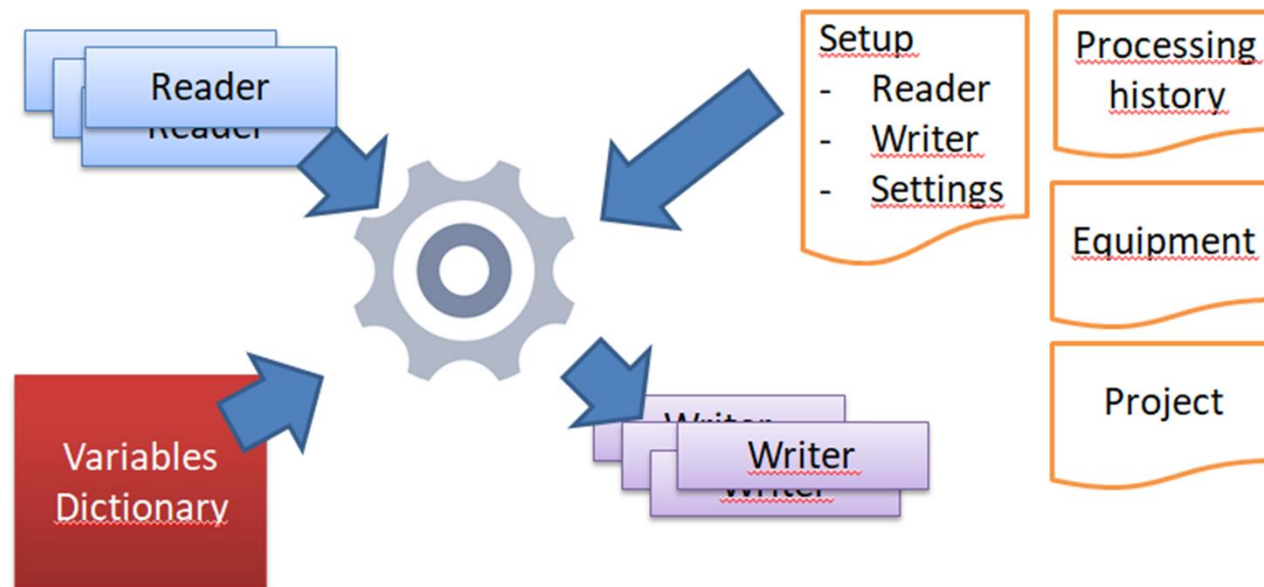
Variables dictionary  
consist of .json files  
and a python class  
for handling it.



# Variables dictionary – What is it for?

```
#fetch the data of a variable  
metadata = var_dict.lookup('time')
```

- Library for other tools
- Documentation
- Search engine
- A platform for community collaboration



Wind data converter (Windaco) structure

# Variables dictionary – What is it for?

```
184     "name": {
185         "default": "time",
186         "cf": "time",
187         "open_oa": "",
188         "iec_61400-25": "SecondSinceEpoch",
189         "e-WindLidar": "",
190         "grib": "",
191         "other": [
192             "t",
193             "timeStamp"
194         ]
195     },
196     "description": "iec_61400-25 defines time as a complex type consisting of two integers SecondSinceEpoch an
197     "units": "s",
198     "ref": {
199         "nvs": "http://vocab.nerc.ac.uk/collection/P07/current/CFSN0115/"
200     },
201     "netcdf": {
202         "var_type": "double",
203         "other": "units=\"seconds since 1970-01-01 00:00:00.00 UTC\", calendar=\"gregorian\" "
204     }
```

- Library for other tools
- Documentation
- Search engine
- A platform for community collaboration



# Variables dictionary – What is it for?

- Library for other tools
- Documentation
- Search engine
- A platform for community collaboration

```
24     "name": {
25         "default": "northward_wind",
26         "cf": "northward_wind",
27         "open_oa": "",
28         "iee_61400-25": "",
29         "e-WindLidar": "",
30         "grib": "34 E132",
31         "other": ["ws_y", "ws_v", "wind speed", "y_wind", "geostrophic_northward_wind"]
32     },
33     "description": "Northward indicates a vector component which is positive when directed northward",
34     "units": "m s-1",
35     "ref": {
36         "nvs": "http://vocab.nerc.ac.uk/collection/P07/current/CFSN0461/"
37     },
38     "netcdf": {
39         "var_type": "float",
40         "other": ""
```

# **THE TOOL IN PRACTICE**

# Metadata

- Yaml files for project setup

# Script

- Show how it works in practice