POTSDAM INSTITUTE FOR CLIMATE IMPACT RESEARCH

Bringing structure into data processing work-flows in R

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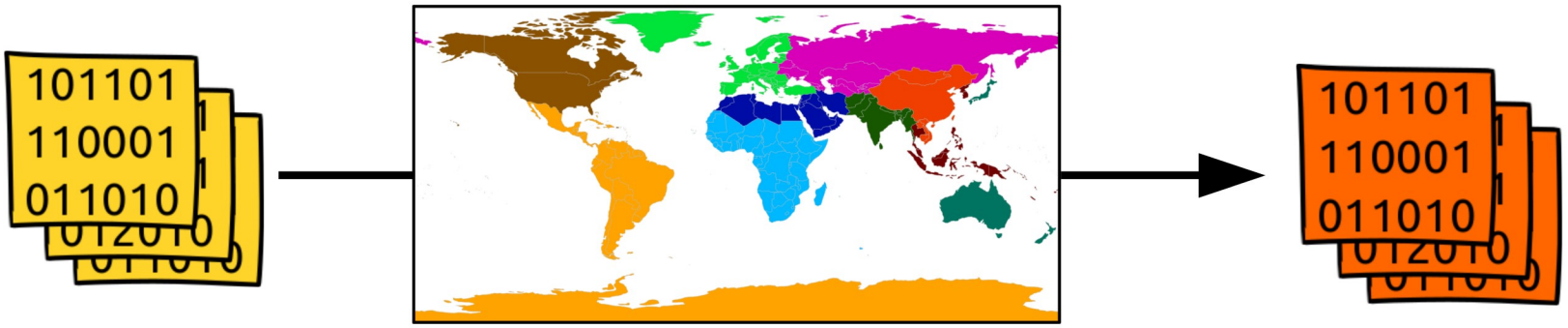
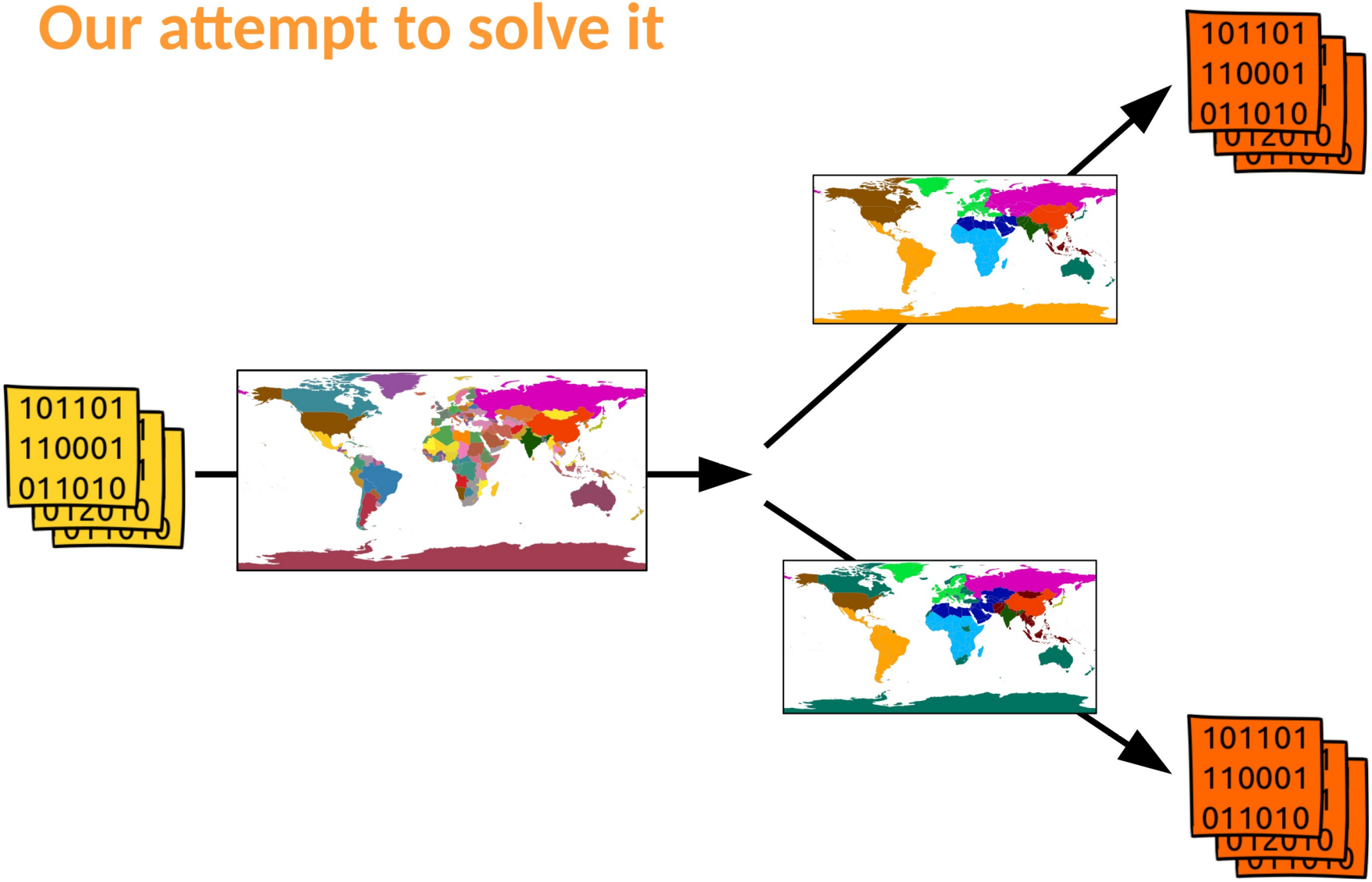
Leibniz Association

The problem



Our attempt to solve it



Our attempt to solve it

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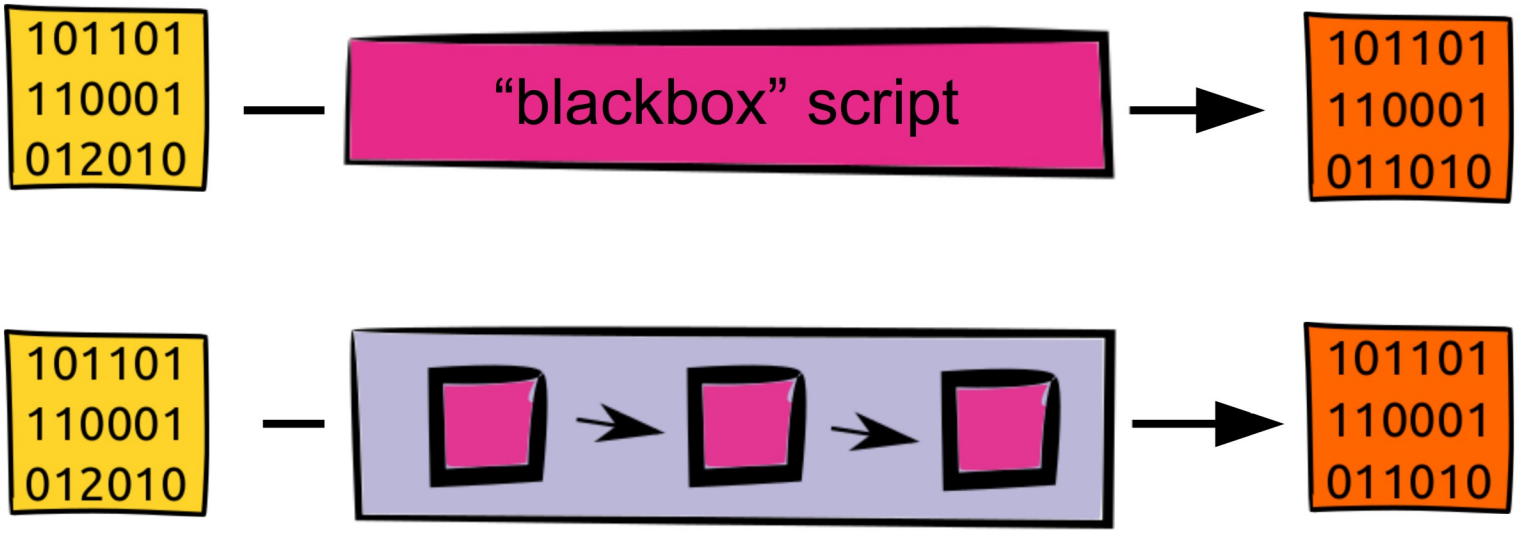

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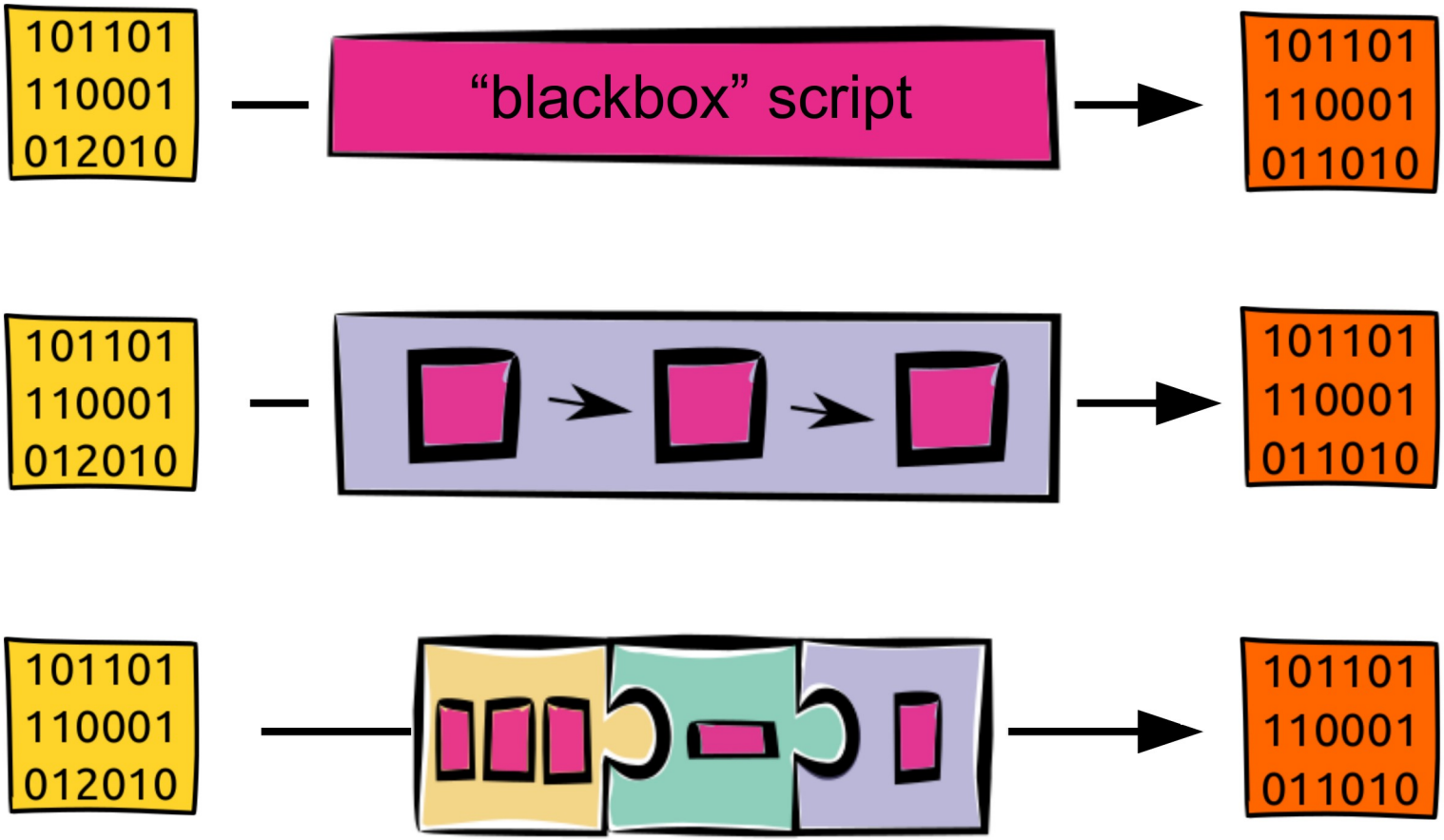


The derived framework

readSource

calcOutput

retrieveData

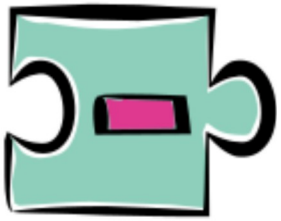
1) Download data
2) Read data and convert to standardized data format
3) Bring data to country-resolution

The derived framework

readSource

calcOutput

retrieveData



- Calculate required data
  - Filtering of data
  - Merging of data different data sources
  - Data harmonization
- Provide spatial aggregation (e.g. weight)

The derived framework

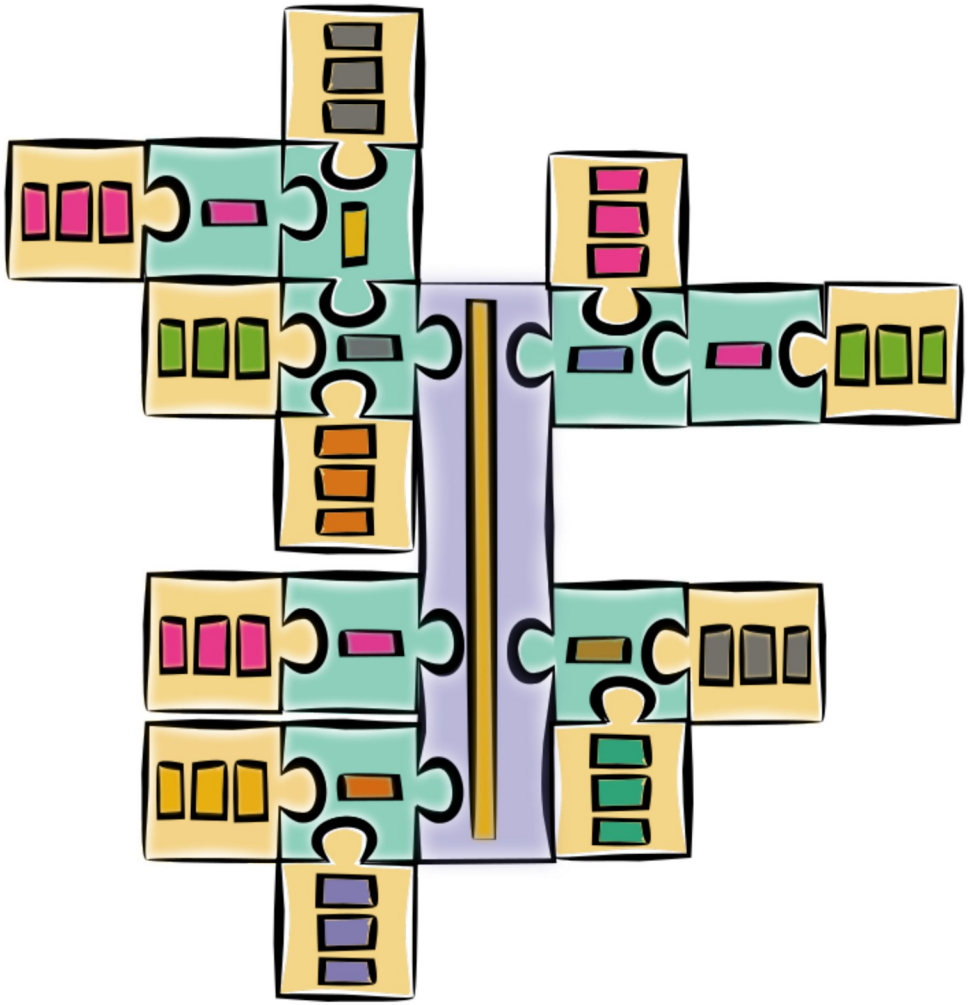
readSource

calcOutput

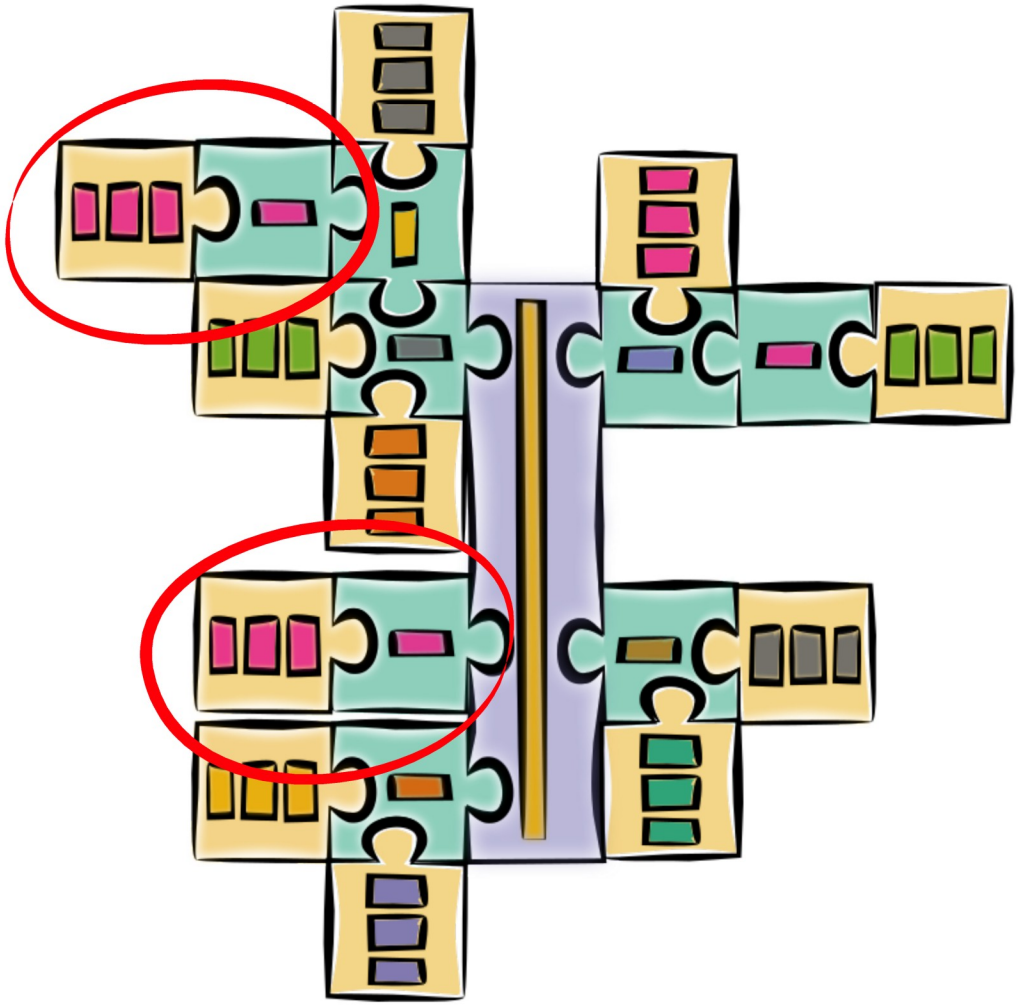
retrieveData

- Collecting data sets
- Coordinate packaging of aggregated data

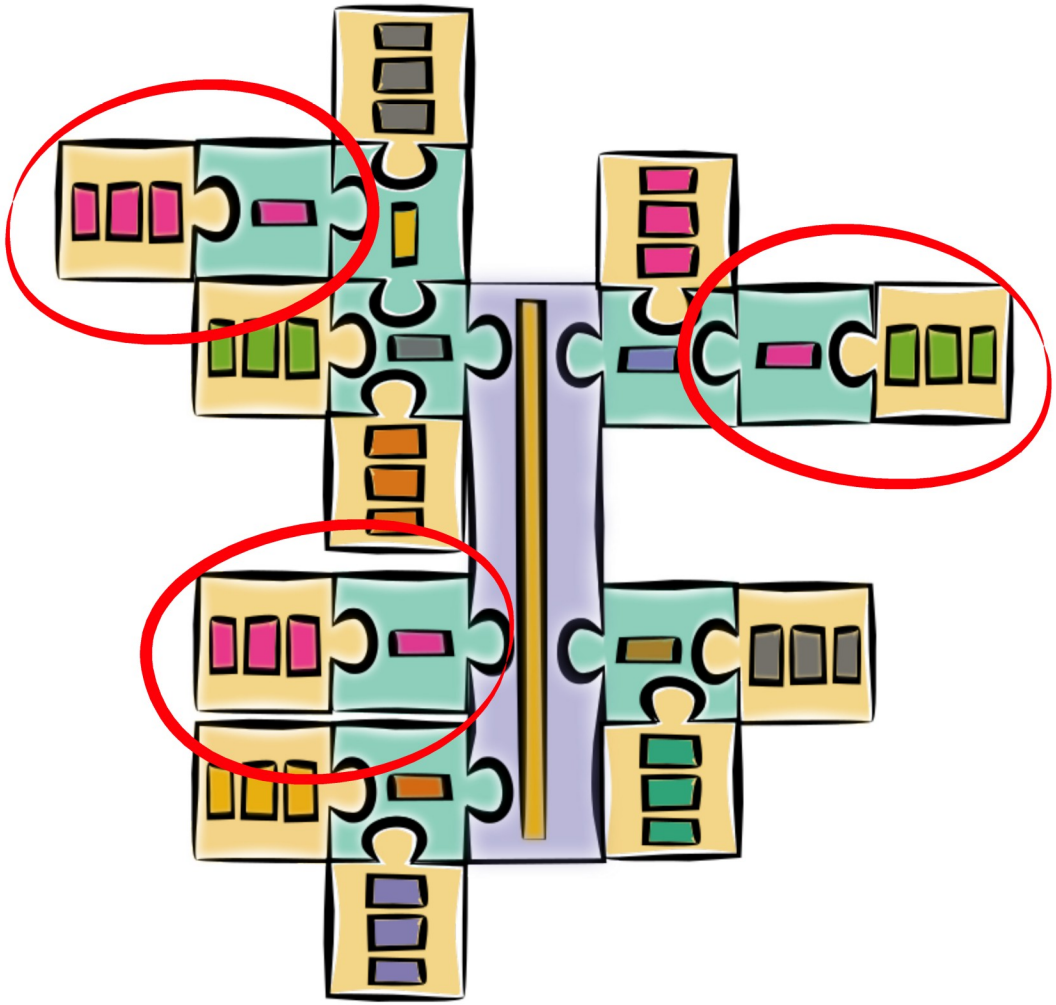
The derived framework



The derived framework

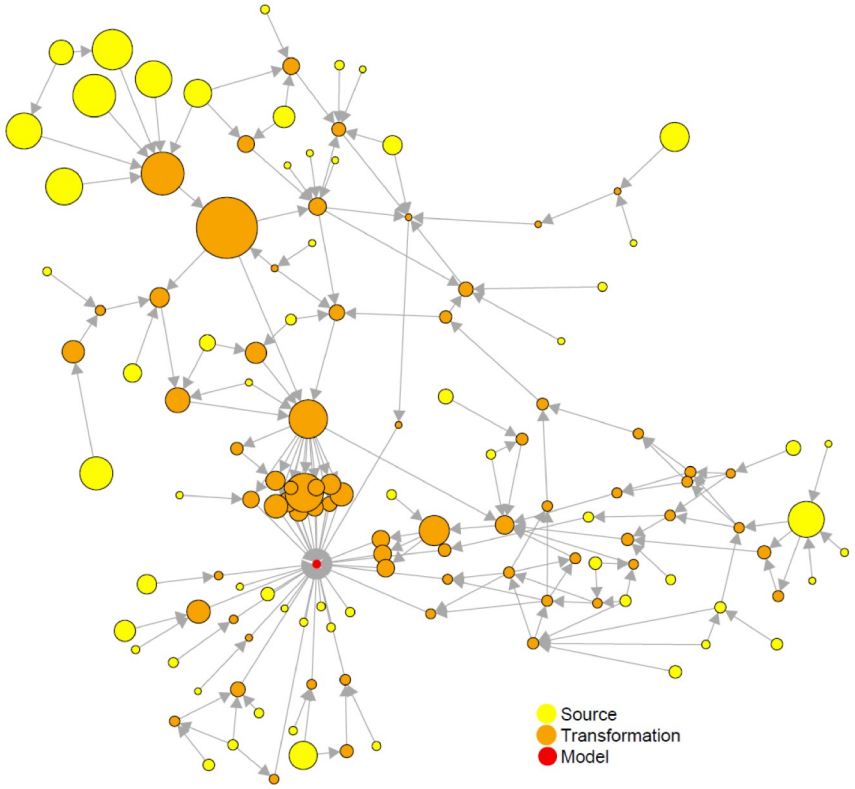


The derived framework



Unanticipated side effects

- A lot of low hanging fruits
  - Meta-data generation
  - Sanity checks
  - Data processing network
  - Data caching
  - Structured log file



- User report faster development
- Broader usage than planned

- Change in focus:

  Spatial aggregation → reproducibility & transparency

Additional Information

- **The R package:**
  - **Name: MADRaT**
    “May All Data be Reproducible and Transparent”
  - **License: BSD2**
  - **Git: https://github.com/pik-piam/madrat**
  - **CRAN: https://CRAN.R-project.org/package=madrat**

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- **Contact: dietrich@pik-potsdam.de**

Backup Slides

wrapper functions

```
calcOutput("ours")
```

```
readSource("yours")
```

user functions

```
calcOurs <- function() {
  a <- readSource("yours")
  #do some fancy calculations
  return(list(x=x,weight=weight,unit="-",
        description="Some example calculations"))
}
```

```
readYours() {
  x <- read.csv("example.csv")
  return(as.magpie(x))
}

convertYours(x) {
  y <- toolAggregate(x,"mapping.csv")
  return(y)
}

downloadYours() {
  download.file("http://exam.ple/data.zip"
                , destfile = "data.zip")
  unzip("data.zip")
  unlink("data.zip")
}
```

Backup Slides

wrapper functions

```
retrieveData("example", rev=1.2,
             modelfoler="example",
             regionmapping="example.csv")
```

user functions

```
fullEXAMPLE <- function(rev=0) {
  if(rev>=1) {
    calcOutput("ours", round=2, file="ours.cs4",
    destination="testfolder")
  } else {
   stop("No calculations for rev<1 available!")
  }
}
```

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