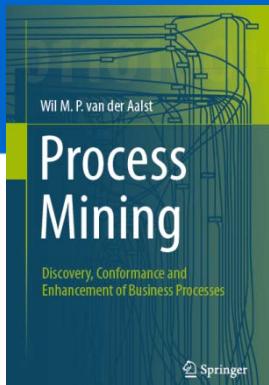


Process Mining: Data Science in Action

Process Models as Maps

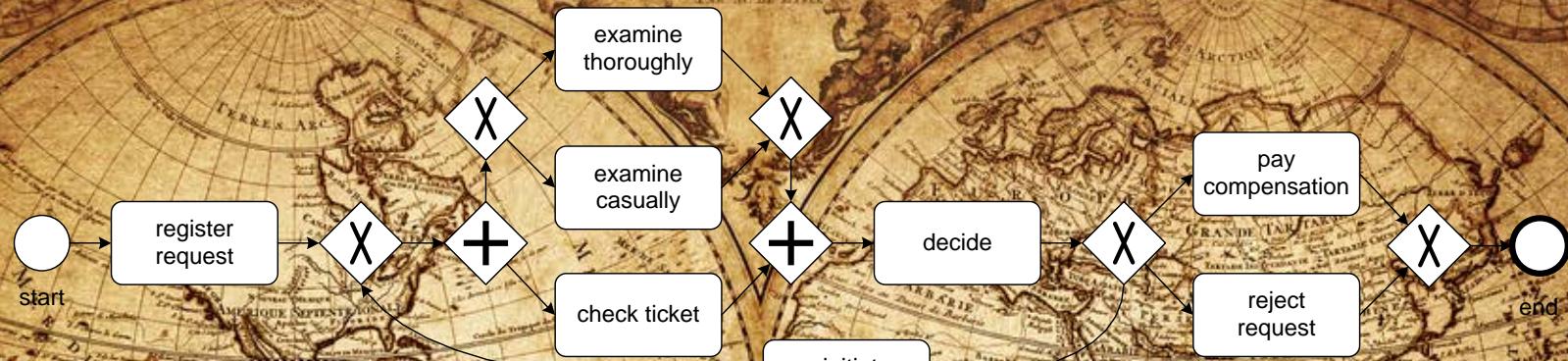
prof.dr.ir. Wil van der Aalst
www.processmining.org



Technische Universiteit
Eindhoven
University of Technology

Where innovation starts

The first geographical maps date back to the 7th Millennium BC.



Process models can be
seen as "process maps"

What we can learn from maps ...

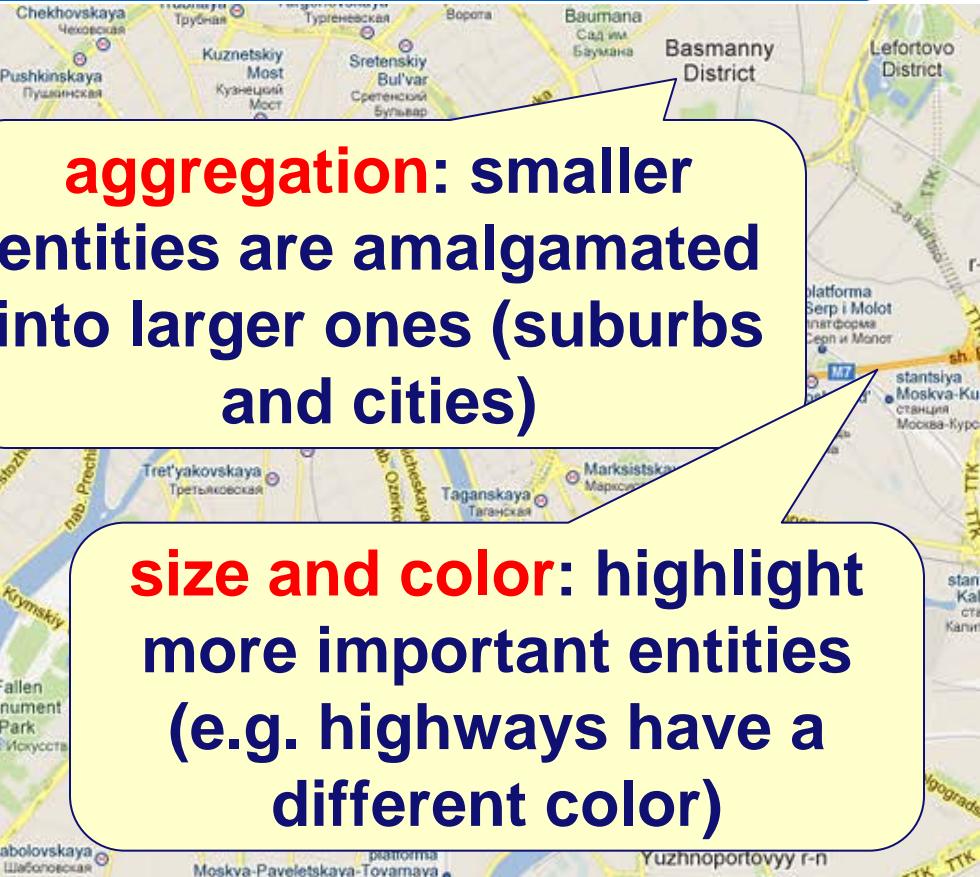
abstraction: leaving out insignificant roads and towns



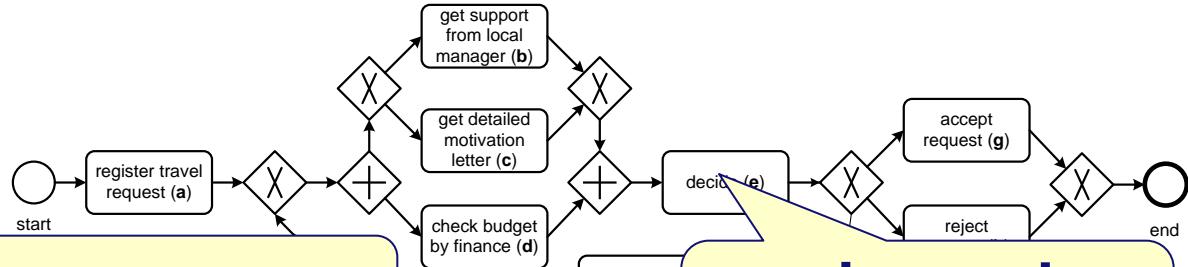
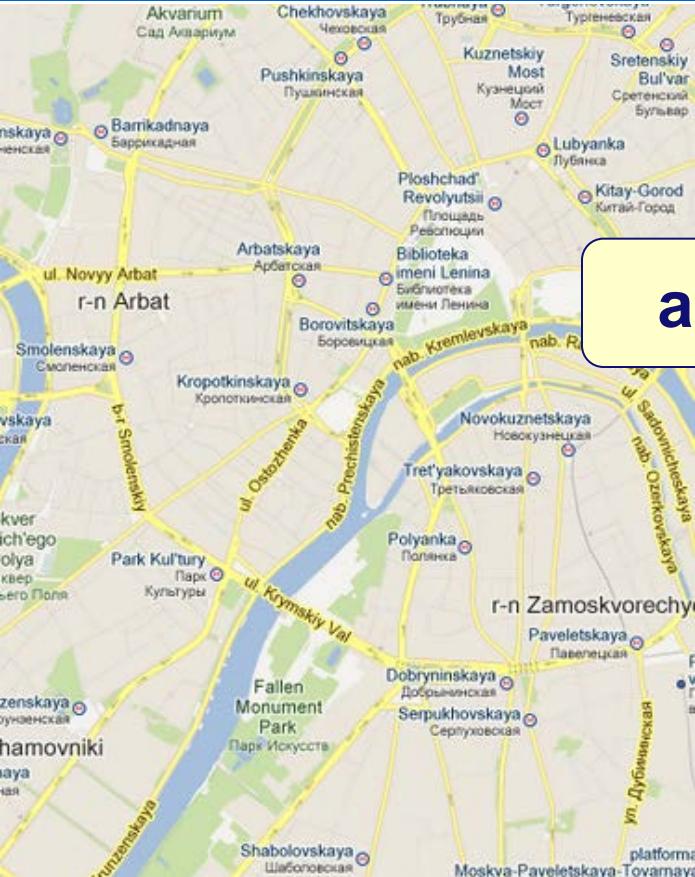
aggregation: smaller entities are amalgamated into larger ones (suburbs and cities)

size and color: highlight more important entities (e.g. highways have a different color)

layout: positioning of elements has a clear meaning

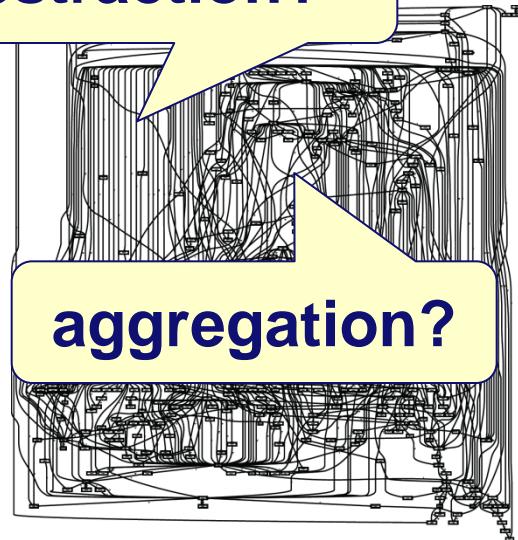


Compare process models to maps

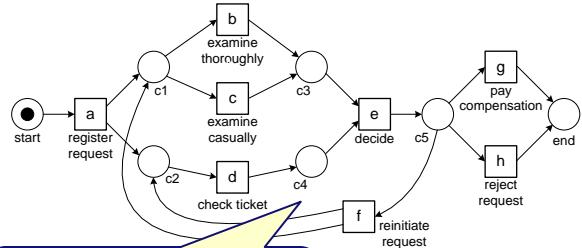


abstraction?

size and color?

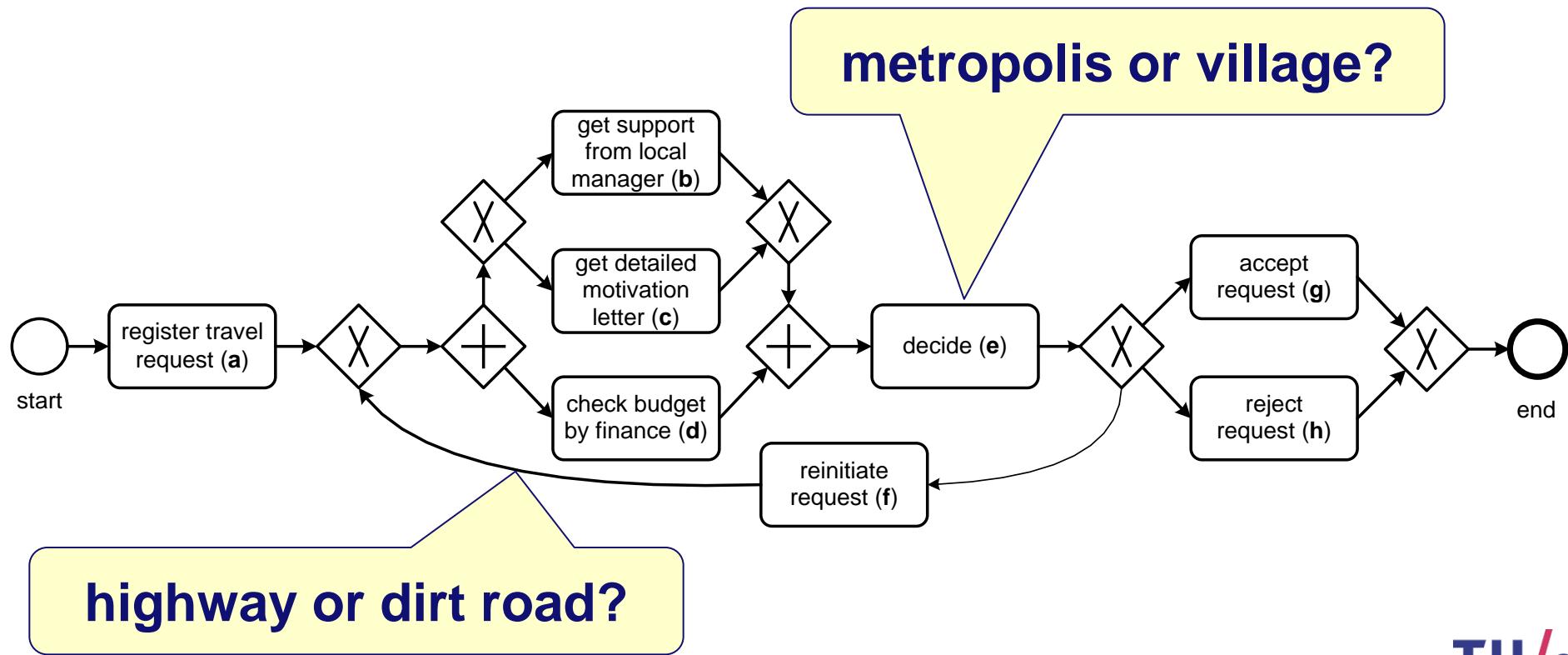


aggregation?



layout?

Can we see what matters most?

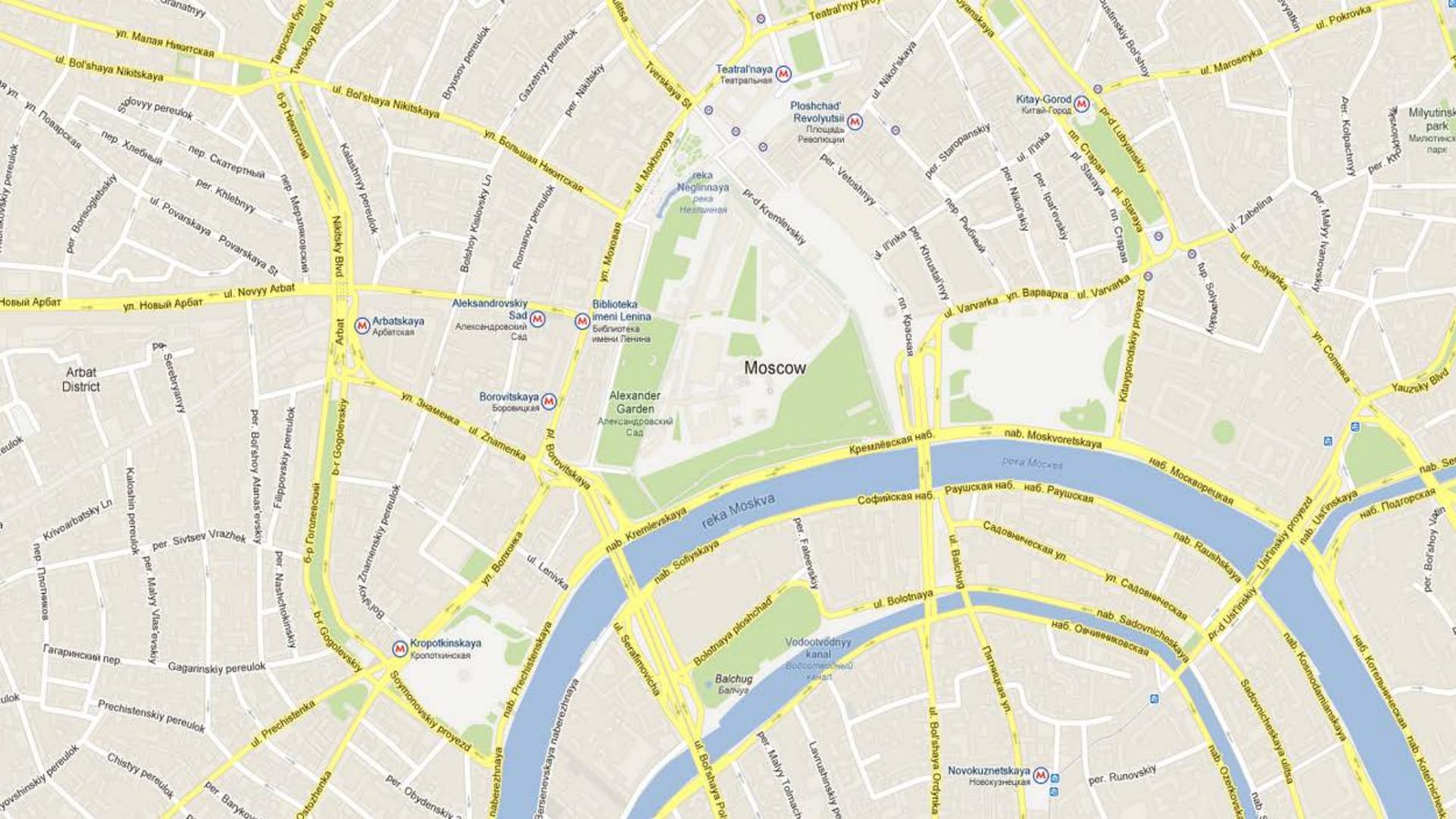




"the map" does not exist ...

Zoom



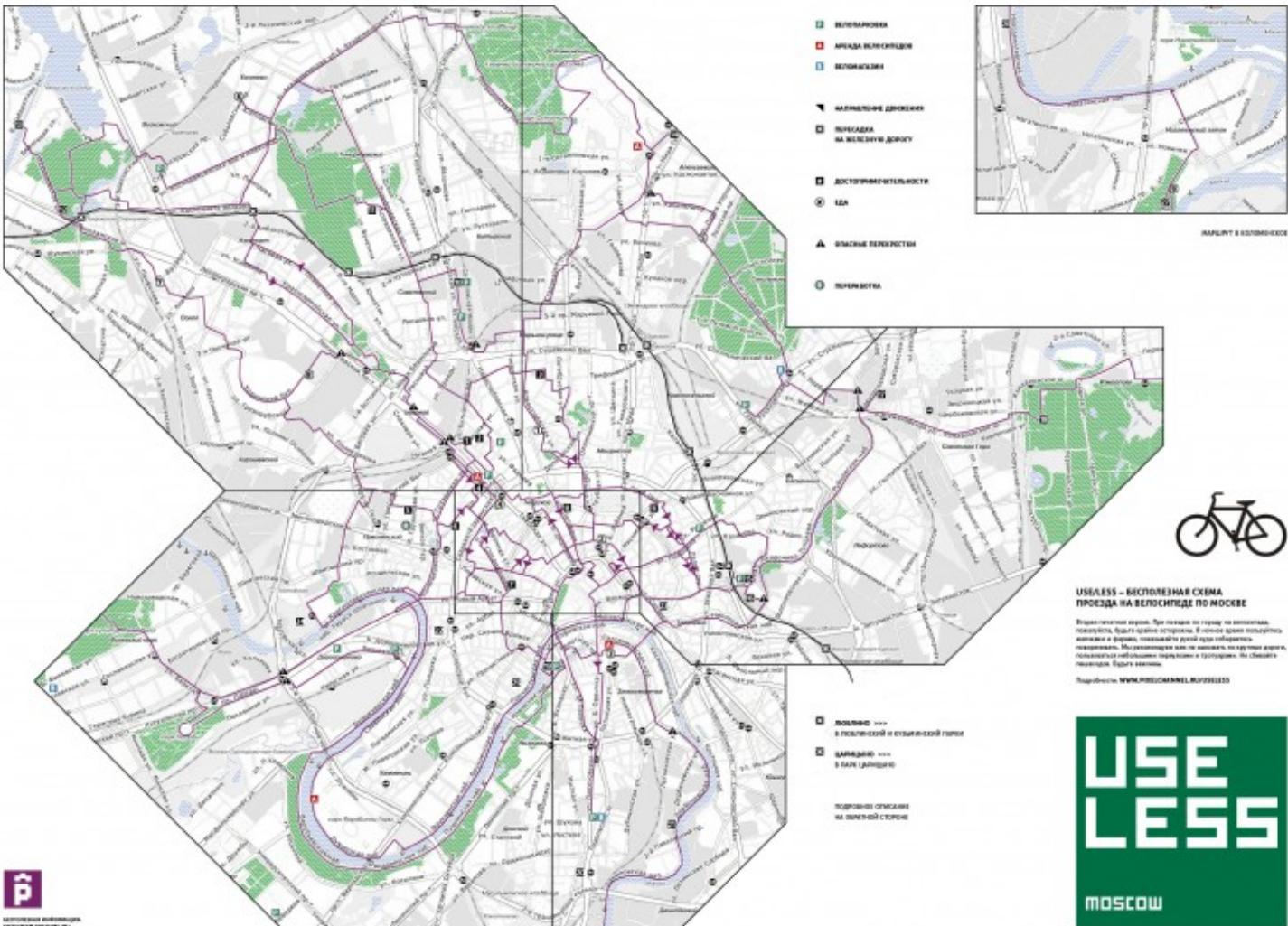




Subway map



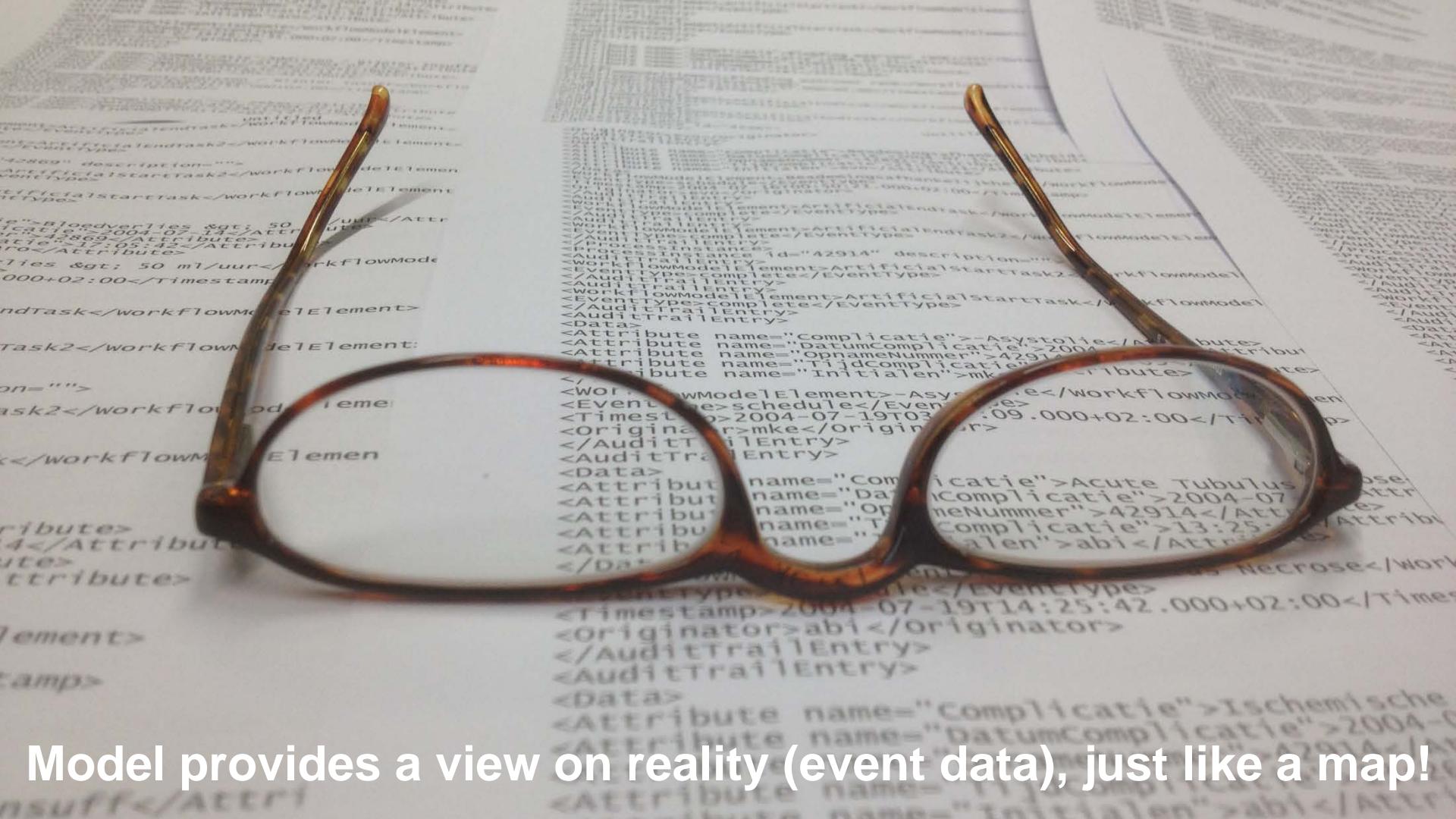
Bicycle map



a map is a view on reality

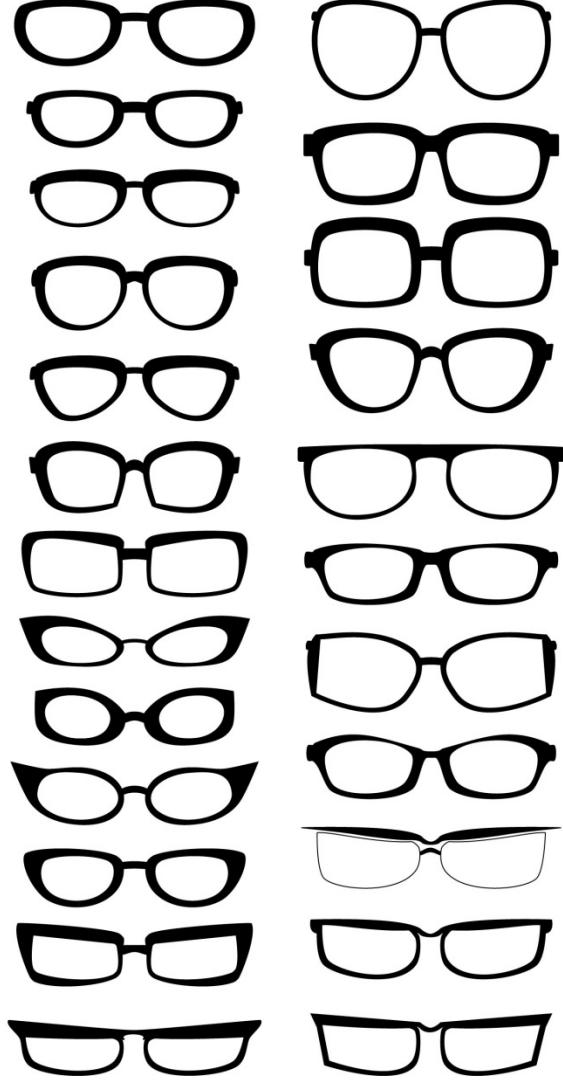
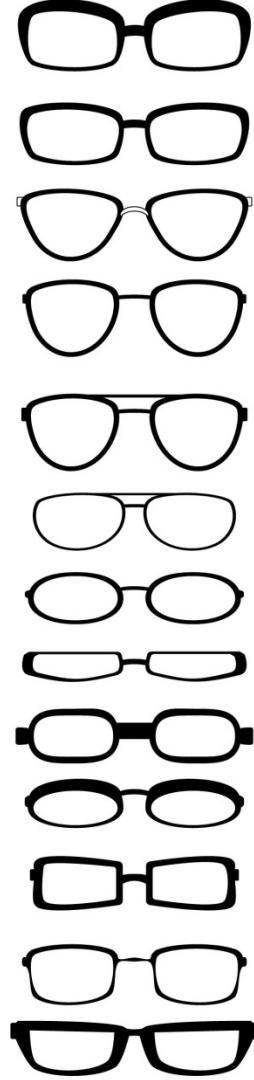
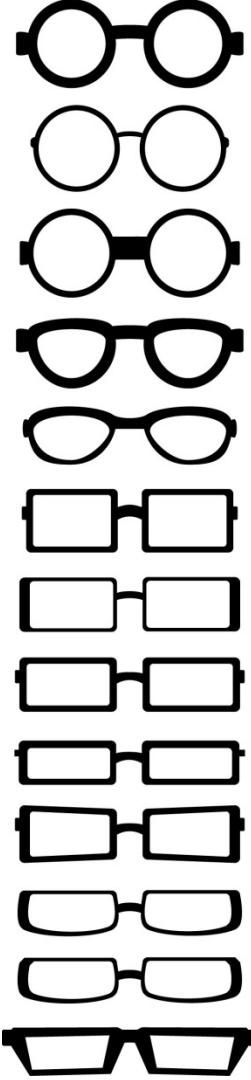
map \neq reality

same for process models ...



Model provides a view on reality (event data), just like a map!

**Multiple views
depending on
purpose
(performance,
compliance,
training, etc.).**

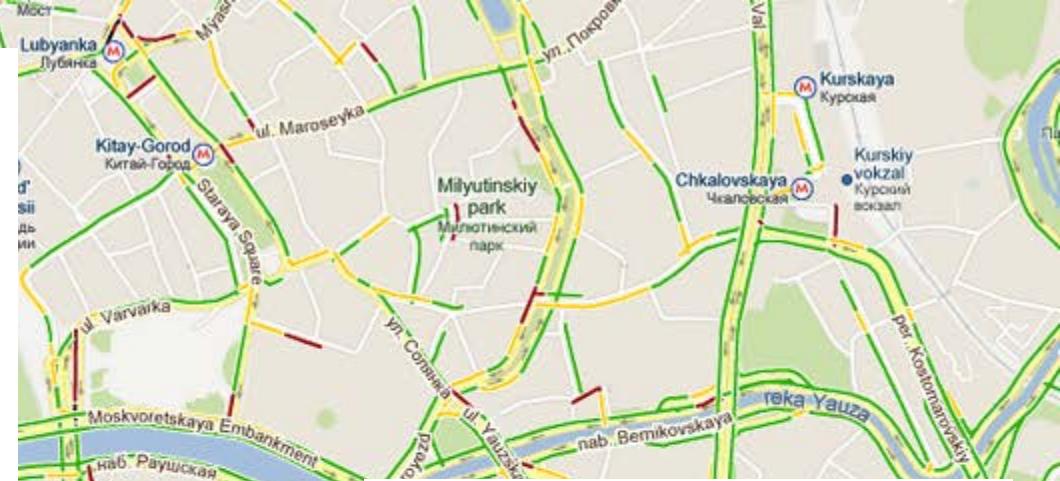


breathing life into process models

otherwise they end up in some drawer ...

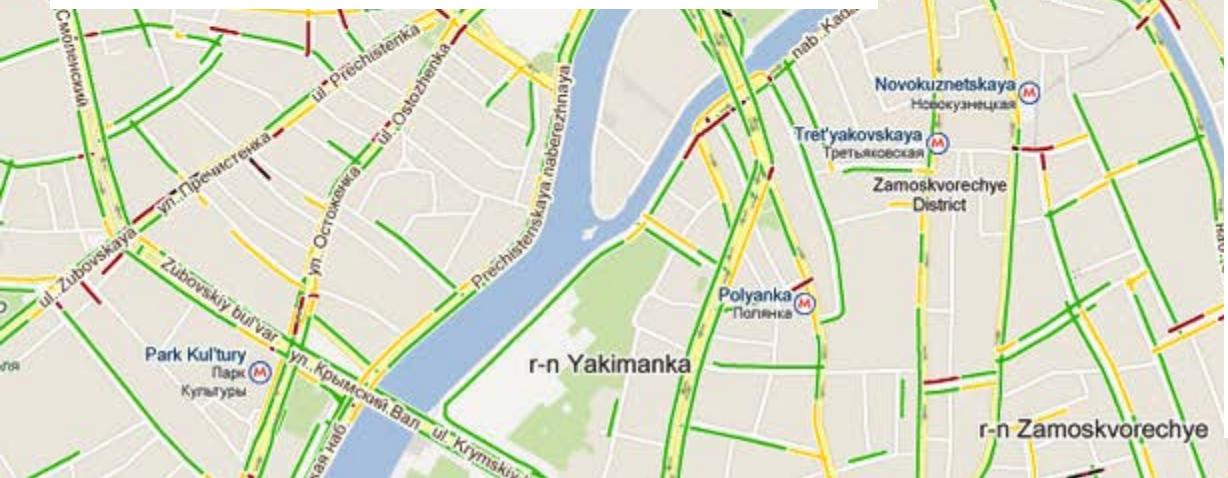
Project on maps:

- traffic jams
- real estate for sale
- location of trucks/trains
- crime rates
- ...

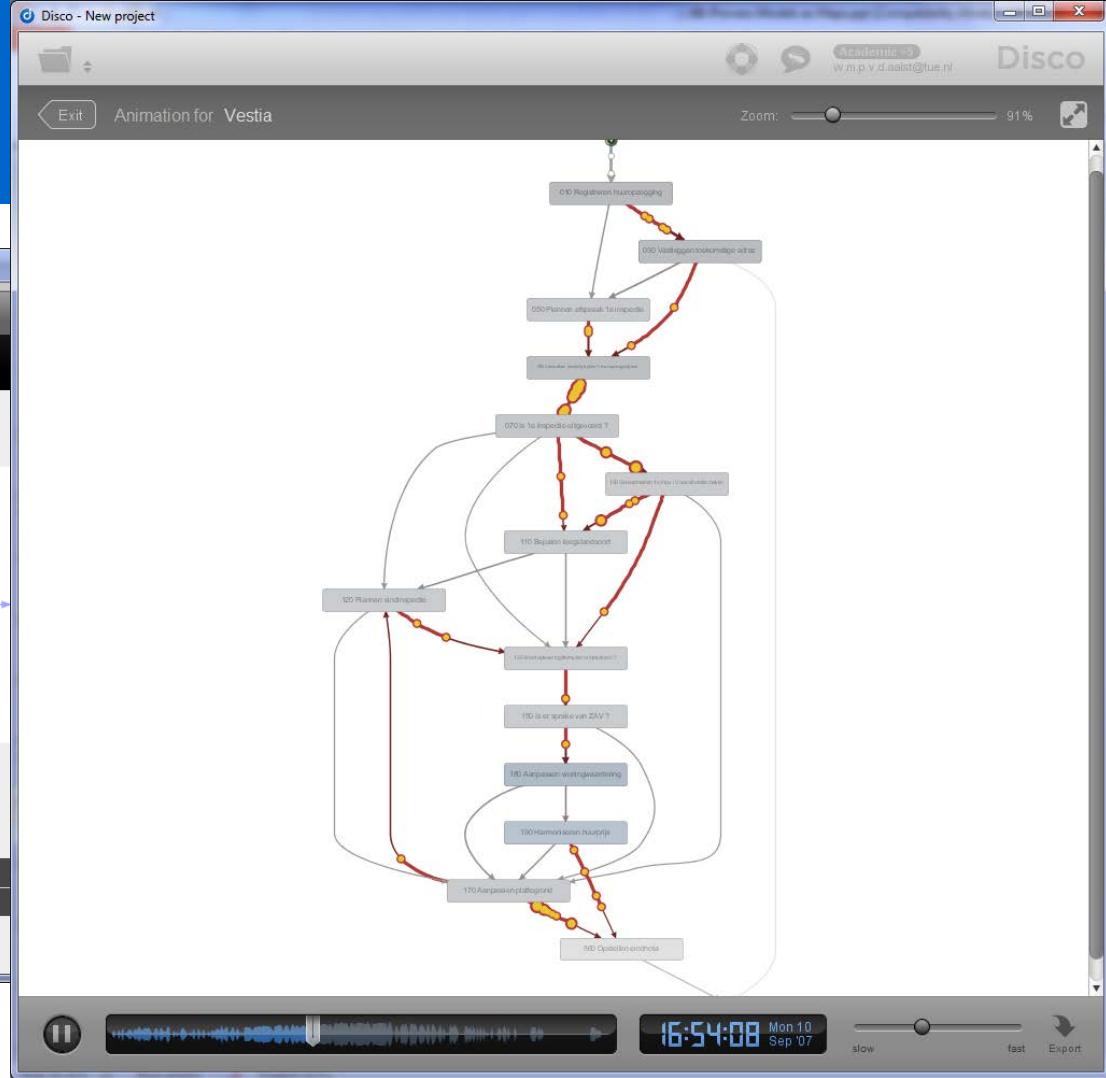
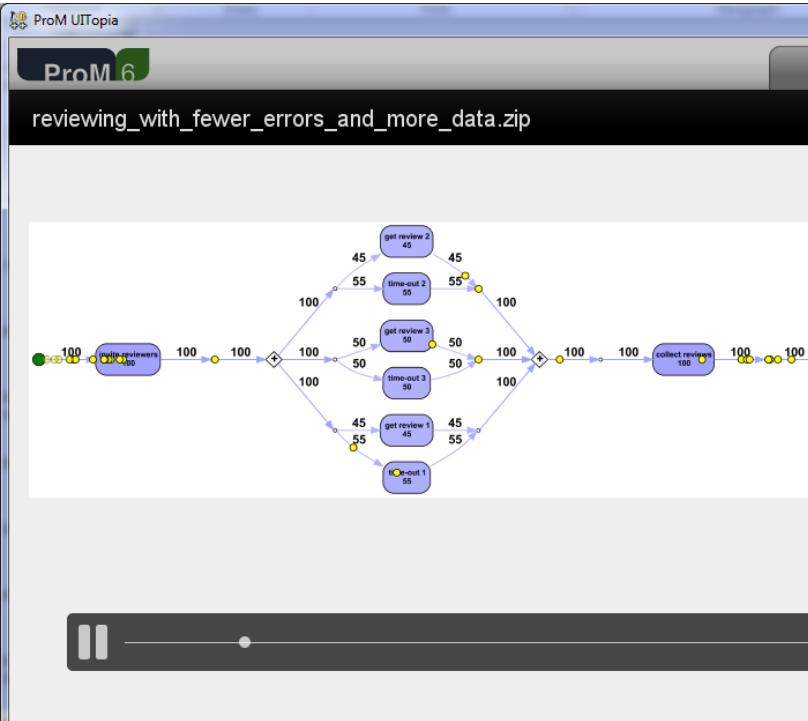


Project on process models:

- bottlenecks
- deviations
- costs
- ...

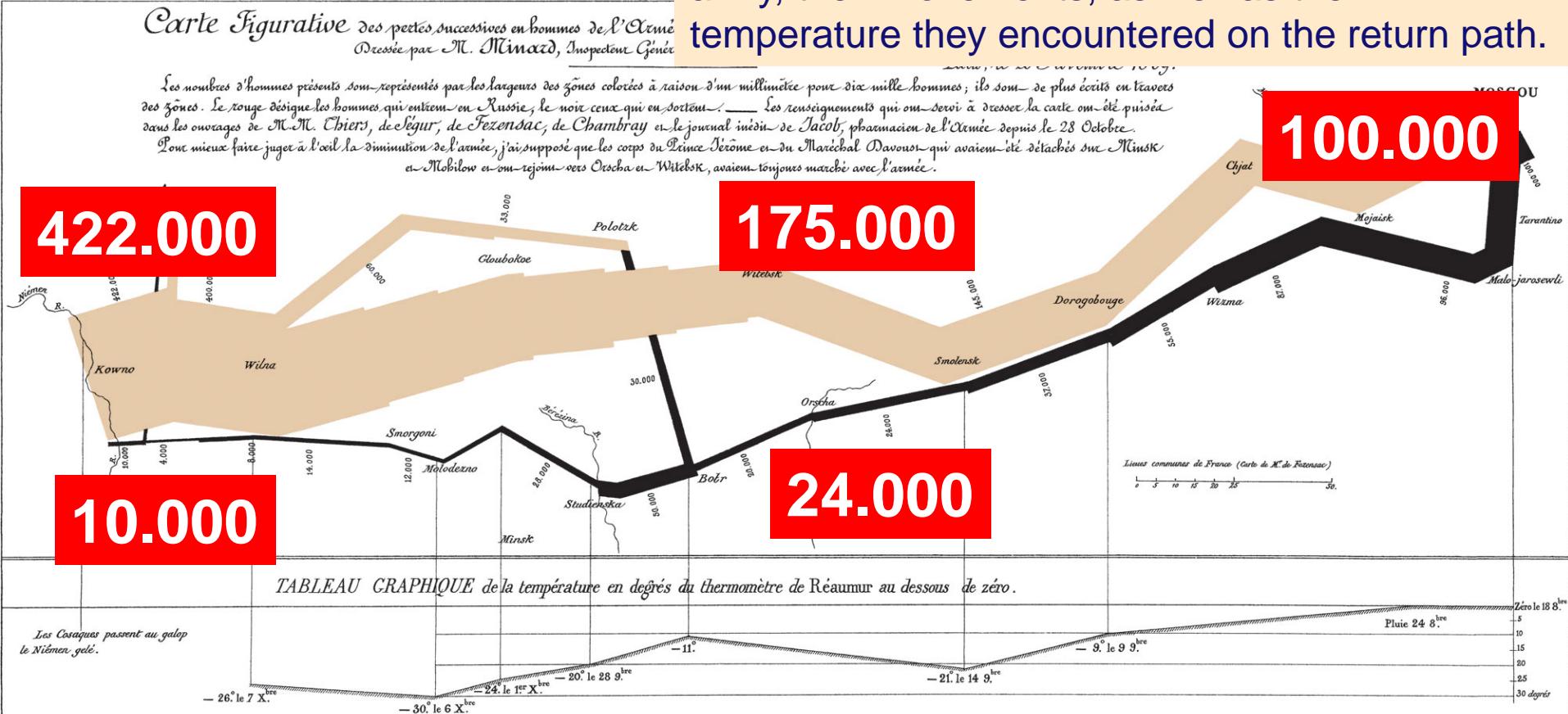


Examples



Not that new ...

Charles Minard's 1869 chart showing the number of men in Napoleon's 1812 Russian campaign army, their movements, as well as the temperature they encountered on the return path.



**Actively using
process models
for operational
support.**



What can we learn from navigation devices?

OS!



Driven by maps, historic information, and current information.



Flexible: Adapts to circumstances and does not force the driver to take a particular route.

Can your information system do this?

- Process models are like maps.
- We can learn from cartography to improve our process models.
- Often multiple maps are needed!
- Connect maps to real data (e.g., depict traffic jams in processes).
- Information systems should be more like navigation devices.



Part I: Preliminaries

Chapter 1

Introduction

Chapter 2

Process Modeling and Analysis

Chapter 3

Data Mining

Part II: From Event Logs to Process Models

Chapter 4

Getting the Data

Chapter 5

Process Discovery: An Introduction

Chapter 6

Advanced Process Discovery Techniques

Part III: Beyond Process Discovery

Chapter 7

Conformance Checking

Chapter 8

Mining Additional Perspectives

Chapter 9

Operational Support

Part IV: Putting Process Mining to Work

Chapter 10

Tool Support

Chapter 11

Analyzing “Lasagna Processes”

Chapter 12

Analyzing “Spaghetti Processes”

Part V: Reflection

Chapter 13

Cartography and Navigation

Chapter 14

Epilogue

