

PROCESS OPTIMIZATION BY IMPLEMENTING TRANSACTION PROCESSING SYSTEMS WITH MICROSOFT EXCEL 2013 MACROS

An adaptable approach for the NatCatSERVICE of Munich Re?



22.04.2016
Kathrin Müller-Rees
HNE Eberswalde

Agenda

1. Company
2. Project
3. Task
4. Software
5. Methods
6. Result
7. Conclusion
8. Outlook
9. Sources



Munich Re [1]

1. The reinsurance company of Munich Re

- One of world biggest reinsurer
- Founded in 1880
- Public holding/DAX company with €3.1 billion profit in 2015
- 12,000 employees
- >60 international sites (e.g. Chicago, São Paulo, Kuala Lumpur and Munich)
- Part of Munich Re Group, further members:
 - ERGO
 - Munich Health
 - MEAG



The „walking man“ statue in front of Munich Re building, Munich [2]

2. The Project: NatCatSERVICE Database (I)





- „Most comprehensible loss database on natural disasters“ (Munich Re)
- Tracking tool for natural catastrophic events by MunichRe developed in 2008
- Access to Geodatabase
- Contains 37,000 datasets, each year round about 800-1,000 events are documented
- Time serial data outputs in Microsoft Excel format

Year	Number of data sets
0079 - 999	30
1000 – 1499	200
1500 - 1899	1,100
1900 - 1949	1,300
1950 - 1979	3,000
1980 - 2016	32,000
Total	~37,000

Number of data sets in the NatCatSERVICE database [3]

2. The Project: NatCatSERVICE Database (II)

- Categorization of natural hazards within the NatCatSERVICE database
 - Division into
 - Event families
 - Main events with sub perils
- Provides systematic overview

Geophysical events	Meteorological events	Hydrological events	Climatological events
 Earthquake	 Storms <ul style="list-style-type: none">- Tropical storm- Extratropical storm- Local windstorm	 Flooding <ul style="list-style-type: none">- River flood- Flash flood- Storm surge	 Extreme temperatures <ul style="list-style-type: none">- Heatwave- Freeze- Extreme winter conditions
Volcanic eruption		Mass movement (wet) <ul style="list-style-type: none">- Rock fall- Landslide- Avalanche- Subsidence	Drought
Mass movement (dry) <ul style="list-style-type: none">- Rock fall- Landslide- Subsidence			Wildfire

Categorization of loss events in the NatCatSERVICE [4]

3. The task during research semester (I)

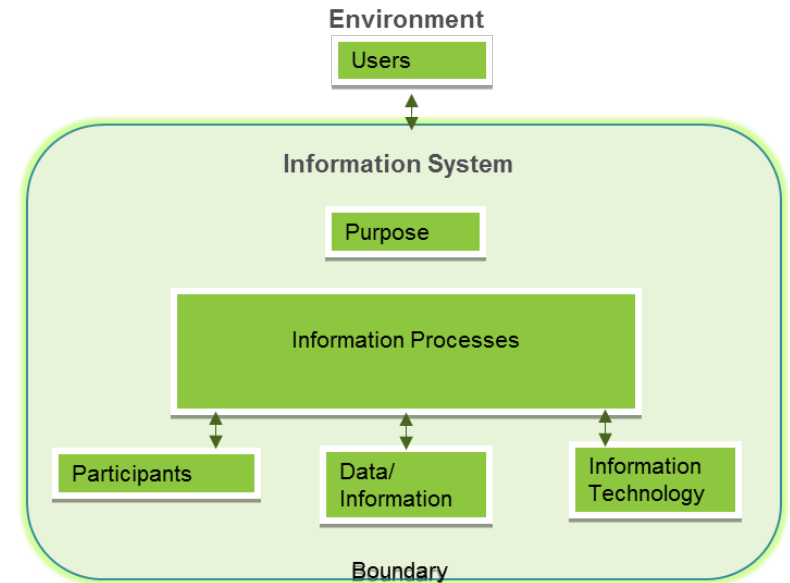
- Technical maintenance of NatCatSERVICE Database by updating on everyday natural hazards
- Perform statistical outputs of database
- Transition from outputs into appropriate format (manually)

Following the Idea:

- Improving automatic processing to receive appropriate formatted charts and diagrams

→ Application of:

Transacting Processing System (TPS)



Concept of Transacting Processing System [5]

3. The task during research semester (II)

The following **problems** where developed during the research semester:

- Manual work flow
 - High risk of faults while copying procedures
 - Time consuming
- NatCatSERVICE data output in old corporate design
 - Charts, pie diagrams formatted in former sheet style

**Ms.
Excel 2013
Macro**

The following **solutions** where introduced during the research semester:

- Automatic process
 - Low risk of faults
 - Time efficient
- NatCatSERVICE data output in new corporate design
 - Actual corporate design, presentations area “prêt à porter” for clients

4. The Software: Microsoft Excel (Macro-Application)

- Ms. Excel Macro is an application with a set of programming instructions which can be stored as Visual Basic Application (VBA) code
- Used to eliminate need of repeating steps performing the tasks over and over again
- Macros follows the “ACID” method:

Atomicity:

No transactions in parts:
either all changes take
place the systems exits the
workflow

Consistency:

Data change from one
consistent state into
another consistent state.



Microsoft Excel Macros 2013 [6]

Isolation:

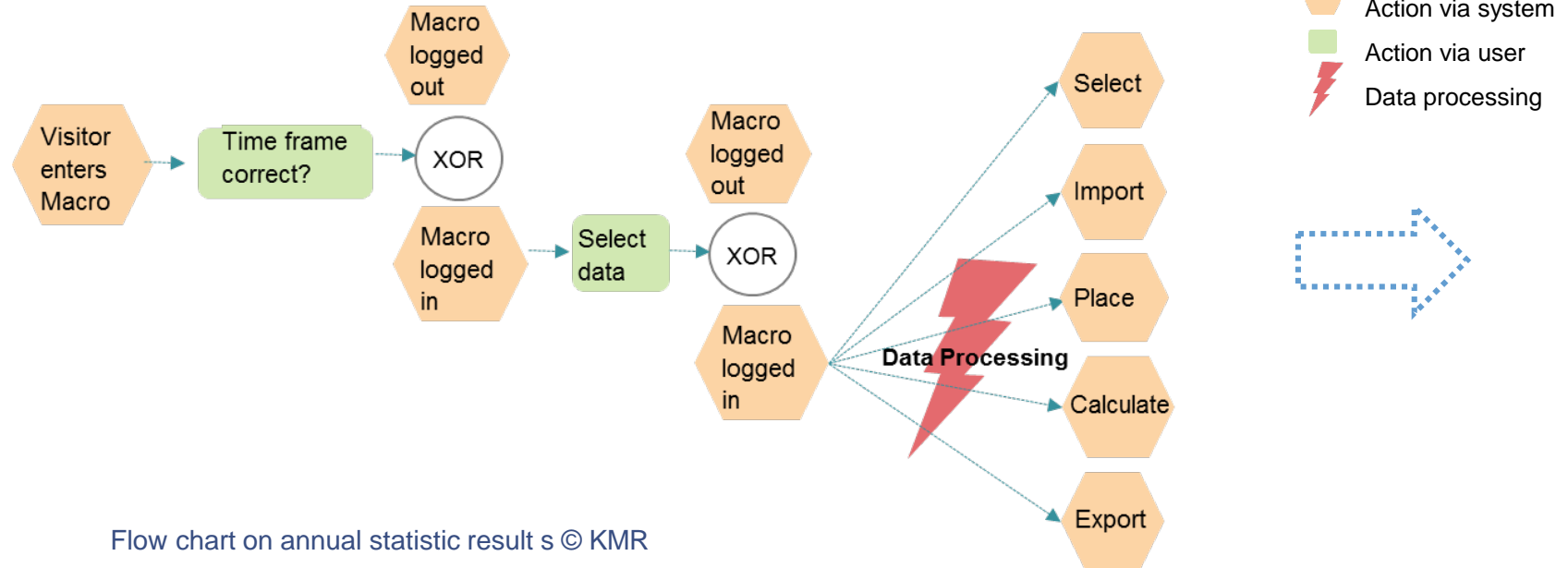
No Interference with each
during concurrently
excecution

Durability:

Transactions have to be
permanent (in order to
avoid crashes crashes)

5. Methods I

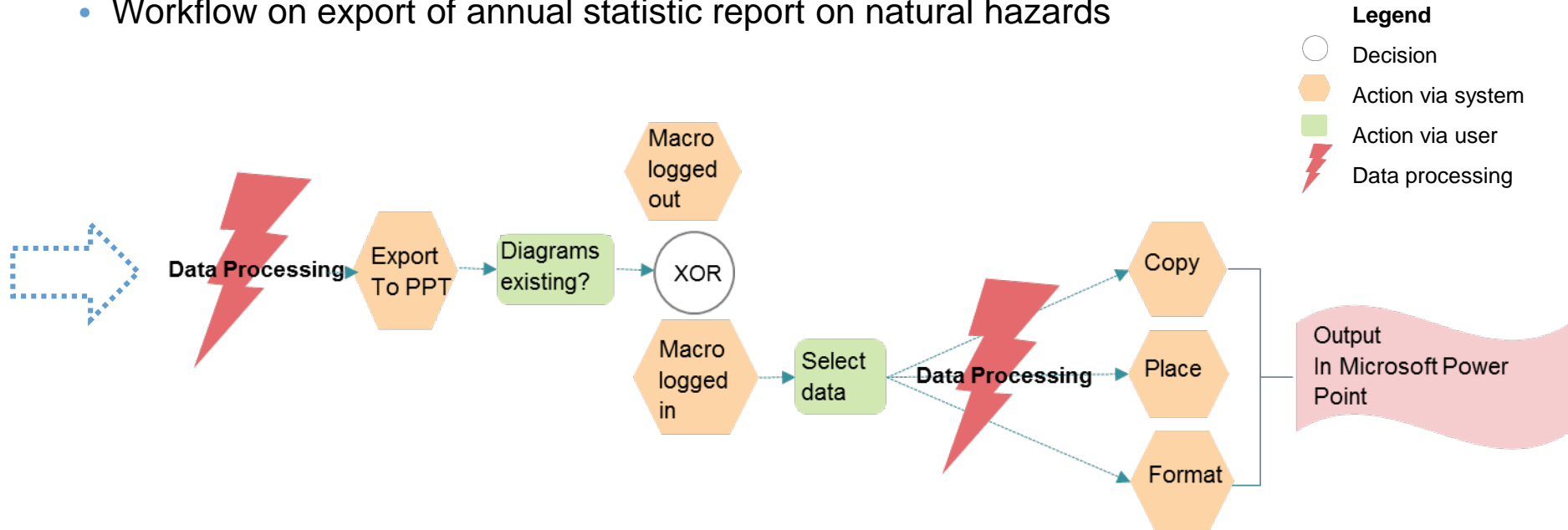
- Different macros developed for outputs of NatCatSERVICE
- Example: workflow on formatting of annual statistic report of loss events



Flow chart on annual statistic results © KMR

5. Methods II

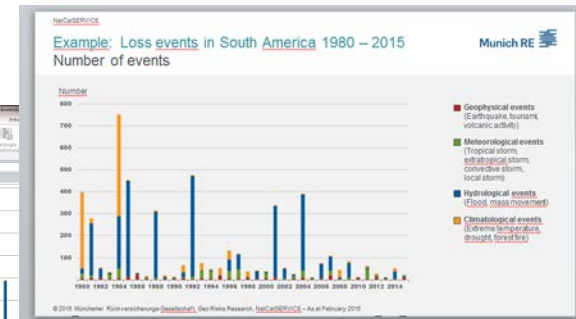
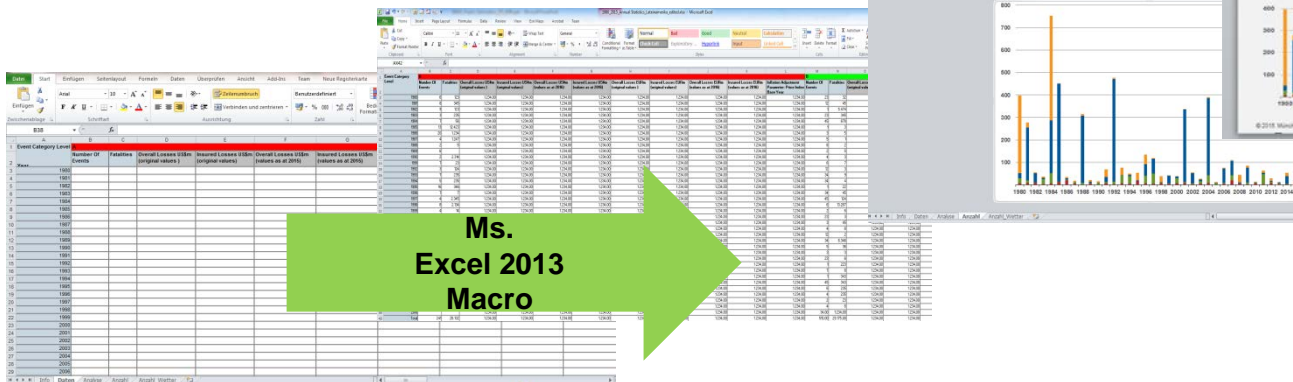
- Workflow on export of annual statistic report on natural hazards



Flow chart on annual statistic results © KMR

6. Result

- Optimized workflow via transacting processing system (Macro) from Excel to Power Point
- Efficient workflow from template to corporate design output



Work flow of Microsoft Excel Macros 2013, containing exemplary data on loss events (Munich Re)

7. Conclusion

- Important aspects to integrate in software development:
 - Evaluate the needs and provide a structure before starting with programming
 - Provide script for other people and let them test
 - Add understandable comments of procedure in the code
 - Develop a good error handling structure
 - Write good and informative error handling
 - Set up copies and backups
 - Take care of Ms. Excel software version (Macros 2013 incompatible with 2010)

8. Outlook

Future handling of the Macro-Code:

- The VB-script is proposed to be implemented in NatCatSERVICE database
- Simplification process of automatic data analyses
- Master Thesis on loss events of NatCatSERVICE database:
 - „Analyses of ENSO related weather anomalies and associated loss events“

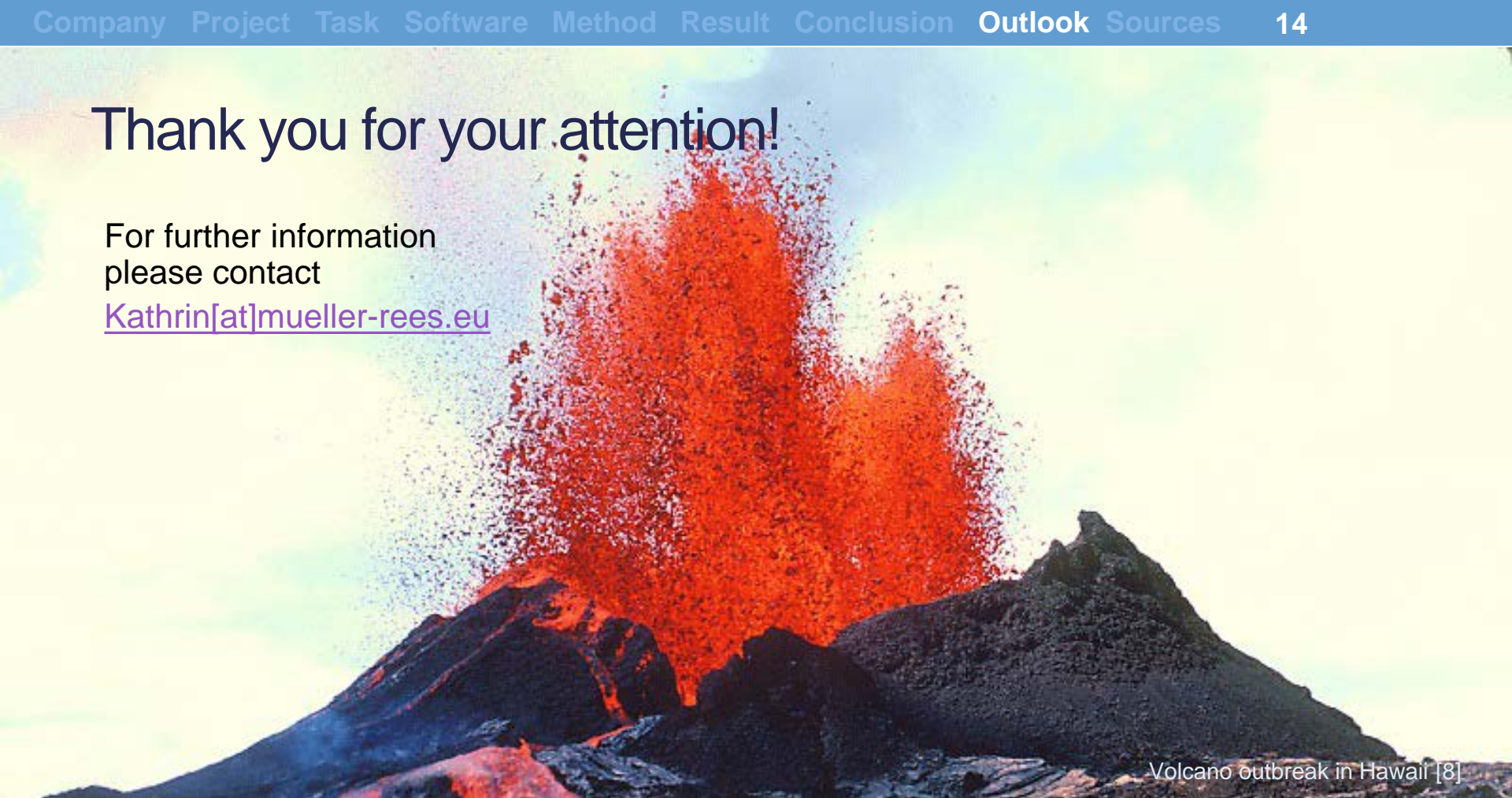


Looking for new solutions [7]

Thank you for your attention!

For further information
please contact

[Kathrin\[at\]mueller-rees.eu](mailto:Kathrin[at]mueller-rees.eu)



Volcano outbreak in Hawaii [8]

9. Sources (content)

- Information about Munich Re
 - <https://www.munichre.com/de/media-relations/publications/press-releases/2016/2016-02-04-press-release/index.html> (selected 20.04.2016)
 - <https://www.munichre.com/syndicate457/mr/key-figures/index.html> (selected 19.04.2016)
 - <http://www.munichre.com/de/group/company/employees/index.html> (selected 20.04.2016)
 - <https://www.munichre.com/de/career/munich-re-as-an-employer/corporate-structure/locations/index.html> (selected 16.04.2016)
 - Munich Re, Geo Risk Research Department, NatCatSERVICE
- Information about software : http://spreadsheets.about.com/od/m/g/macro_def.htm (selected 20.04.2016)
- Information about ACID: <https://www.techopedia.com/definition/23949/atomicity-consistency-isolation-durability-acid> (selected 27.04.2016)

9. Sources (images/charts)

Logos on header: hnee.de, sggw.pl, Munich Re on logostage.com (selected 27.04.2016)

[1] Munich Re, <http://www.munichre.com/en/media-relations/image-archive/architecture/index.html> (selected 27.04.2016)

[2] Sven Teschke, https://de.wikipedia.org/wiki/Munich_Re#/media/File:2012-07-17_-_Landtagsprojekt_M%C3%BCnchen_-_Walking_Man_-_7338.jpg (selected 27.04.2016)

[3] Munich Re, Geo Risk Research, NatCatSERVICE, „Munich Re NatCatSERVICE“, as at July 2015

[4] NatCatSERVICE brochure „Natural catastrophe know-how for risk management and research“, Munich Re, 2011

[5] http://www.boardofstudies.nsw.edu.au/syllabus_hsc/ipt-syllabus/8-1-introduction-information-skills-systems.php (selected 27.04.2016)

[6] <http://www.brainchamber.com/2013/07/08/macro-to-insert-rows-in-excel-based-on-a-value/> (selected 27.04.2016)

[7] http://www.cambiandocreencias.com/wp-content/uploads/2012/05/Fotolia_35061180_XS.jpg (selected, 27.04.2016)

[8] USGS, http://hvo.wr.usgs.gov/gallery/kilauea/erupt/24ds064_L.jpg (selected 27.04.2016)