Master's Thesis – Kick-off presentation

Assessing the cost and benefit of a microservice landscape discovery method in the automotive industry

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27.05.2019

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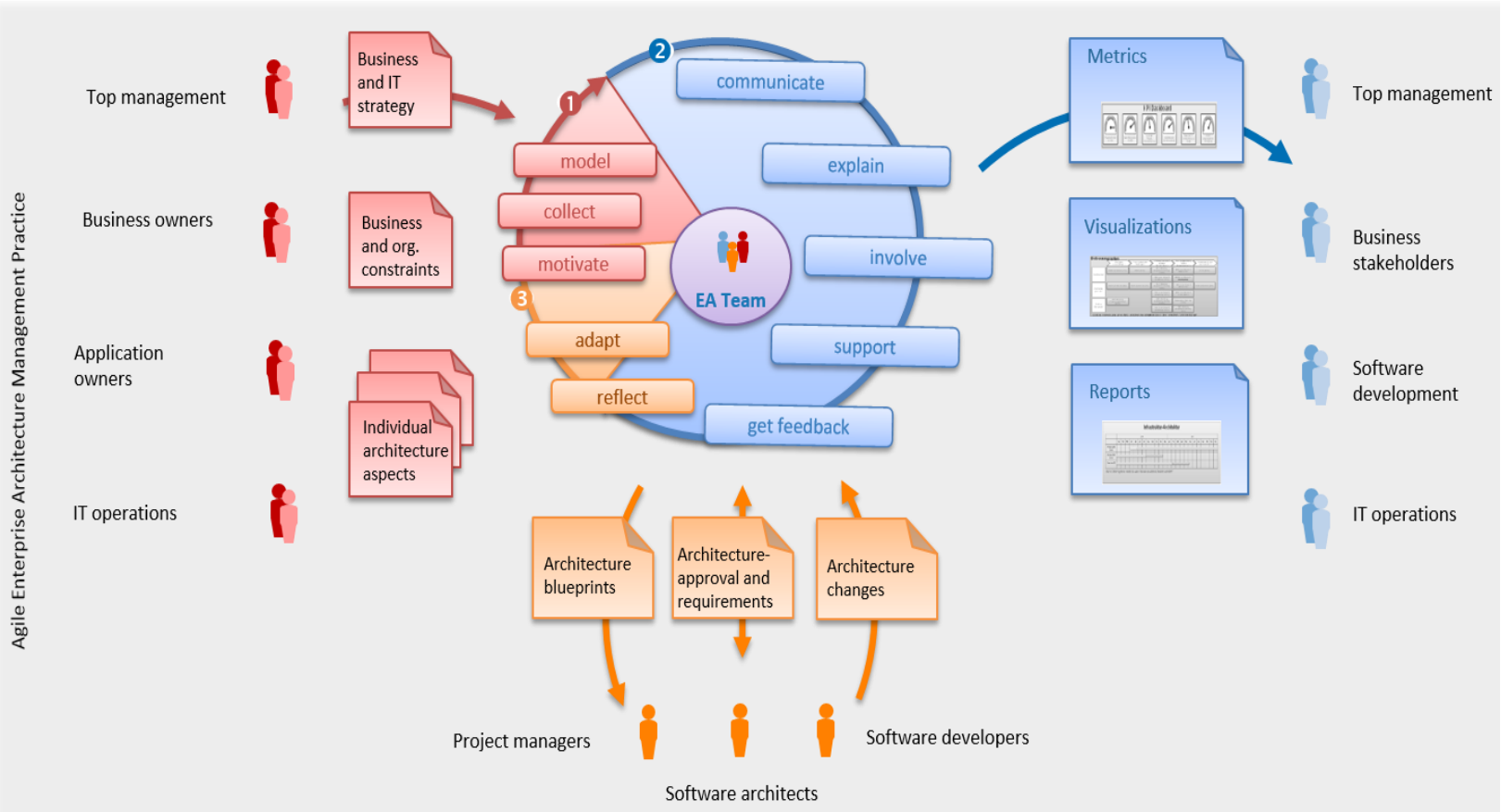
Agenda

1. Motivation
2. Research problem
3. Research questions
4. Solution proposal
5. Evaluation
6. Timeline
7. Discussion

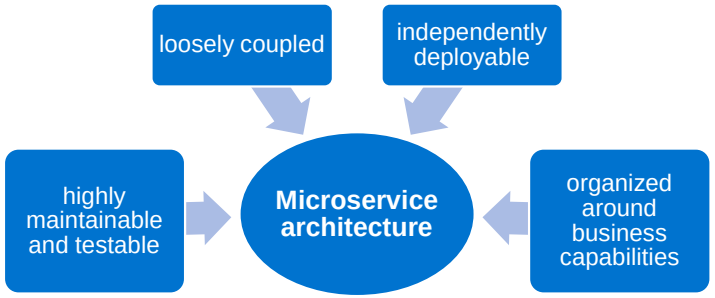
1. Motivation (1)

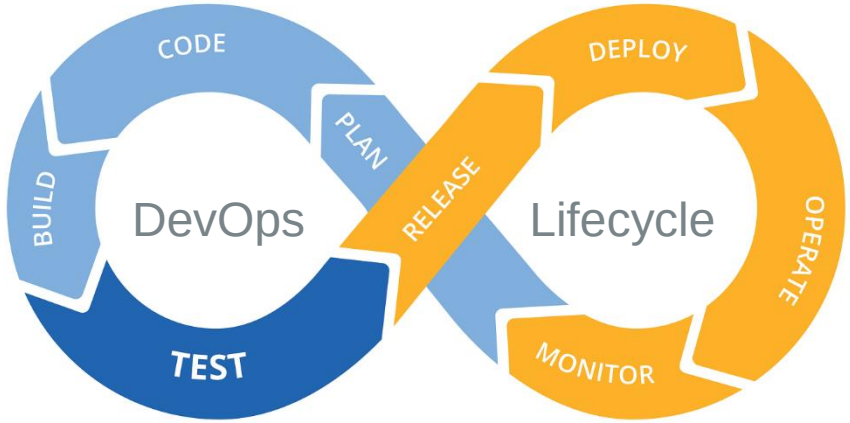


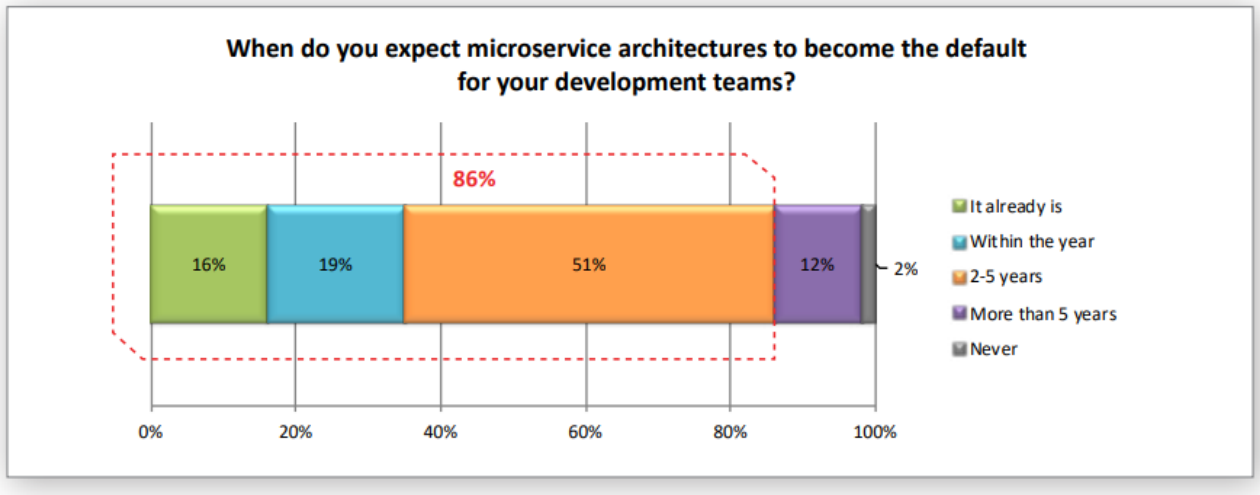
- EAM aims to document and manage the complexity of the business IT landscape in relation to business requirements
- conveys holistic view of entire organization
- define current state in an EA model and derive future planned states heading towards an optimized EA
- improve business and IT alignment
- realize cost saving potentials

source:
wwwmatthes.in.tum.de

1. Motivation (2)



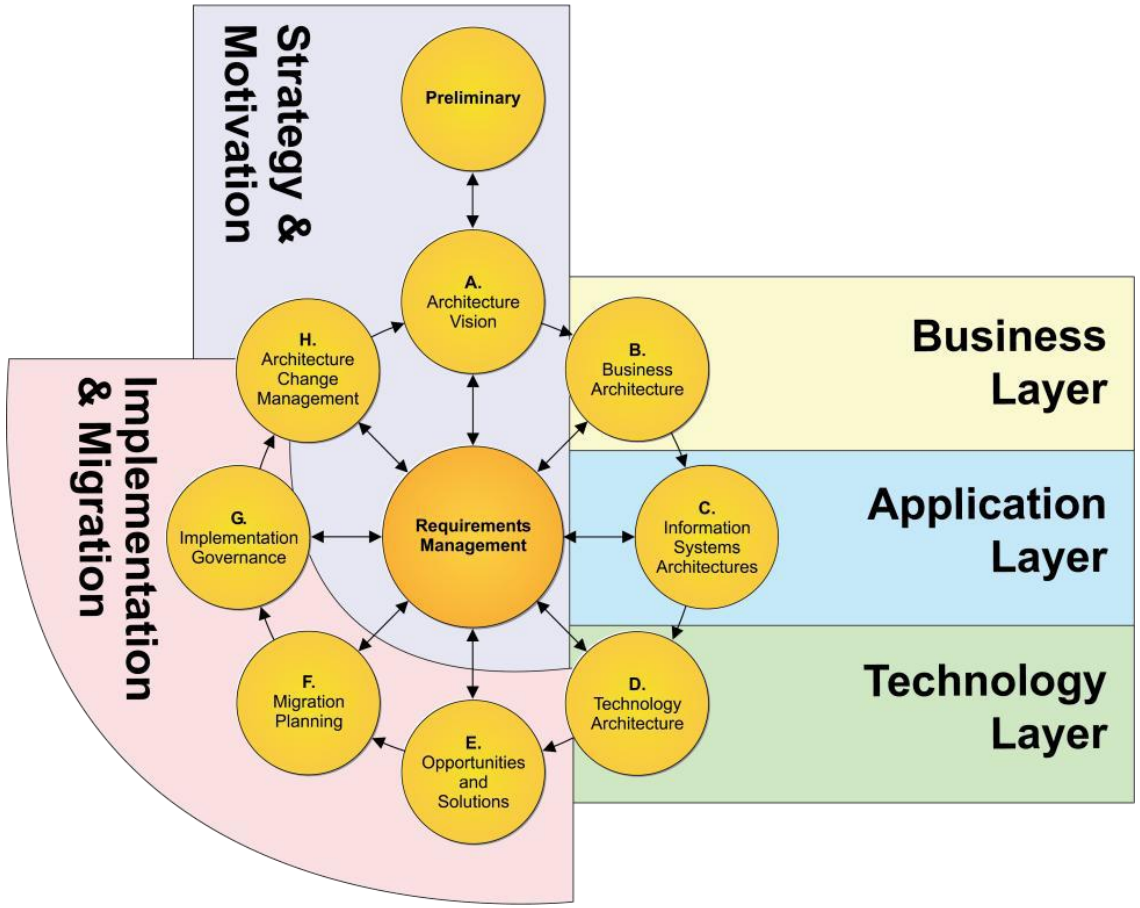




- rising adoption of agile methodologies and microservice-based architectures
- rising number of code deployments
- decrease in time-to-market
- EA landscape is in constant change
- EAM Tools provide support, but require manual input
- high degree of manual work with very little automation
- widely distributed responsibilities
- EA documentation often incomplete or outdated and mostly very costly to maintain
- research on holistic models/tools to facilitate EAD scarce

source:
www.microservices.io
https://openwt.com
Dimensional Research: Global Microservices Trends: A survey of development professionals (April 2018)

1. Motivation (3)



Mapping between TOGAF ADM and ArchiMate language

in previous work source entities of the ArchiMate meta-model could be covered with

- 20% on the business layer,
- 75% on the application layer and up to
- 50% on the technology layer

automation of EAD faces various challenges:

- overload of productive systems due to large volume of transactions for automated data collection
- selection of the right productive systems as information sources for EAD
- detection of changes and propagation
- insufficient data quality at source
- transformational challenges due to missing standards
- abstraction gap

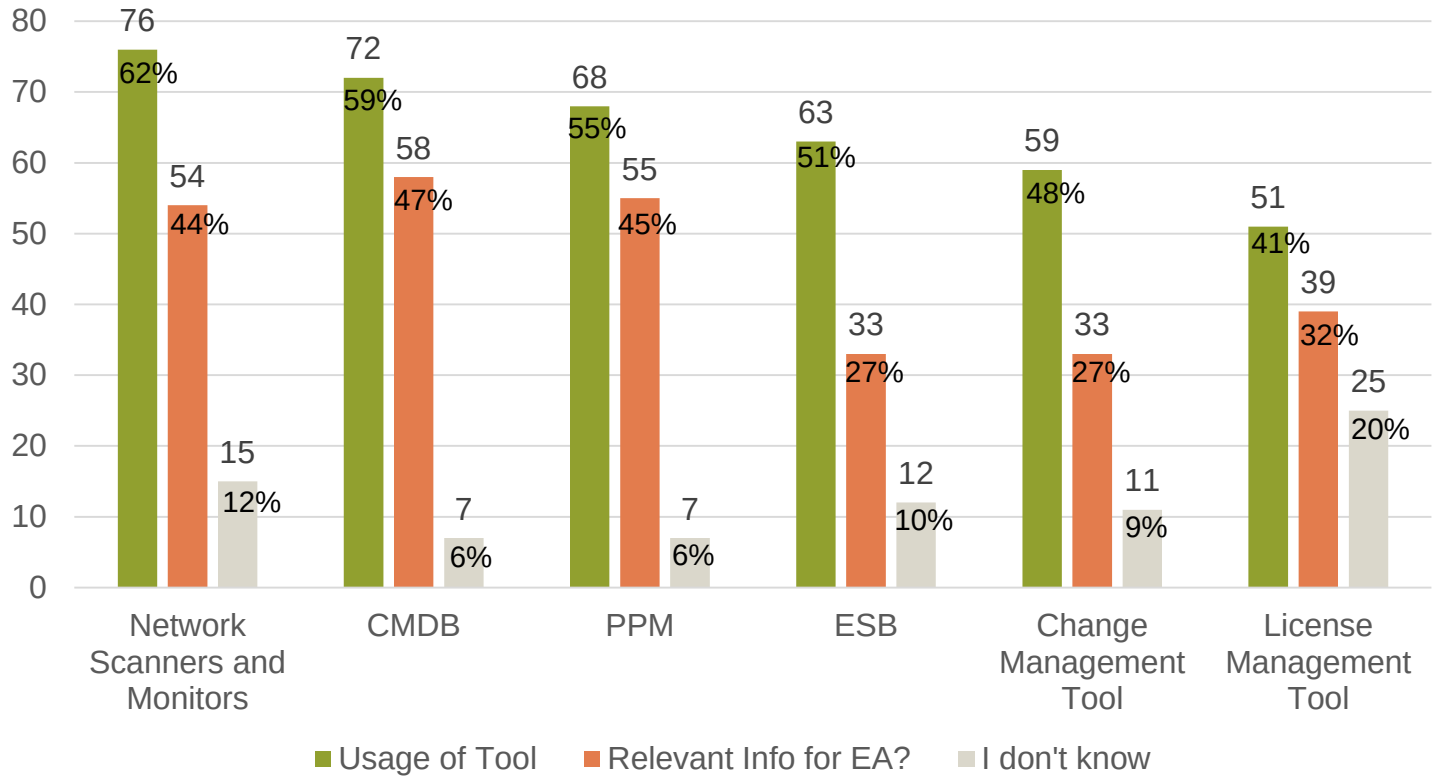
source:
https://www.opengroup.org/togaf

M. Buschle, M. Ekstedt, S. Grunow, M. Hauder, F. Matthes, and S. Roth. Automated Enterprise Architecture Documentation using an Enterprise Service Bus. 2012.
Hauder, M., Matthes, F., Roth, S.: Challenges for Automated Enterprise Architecture Documentation - In the 7th Workshop on Trends in Enterprise Architecture Research (TEAR 2012), Barcelona, Spain, 2012.

2. Research problem

(1)

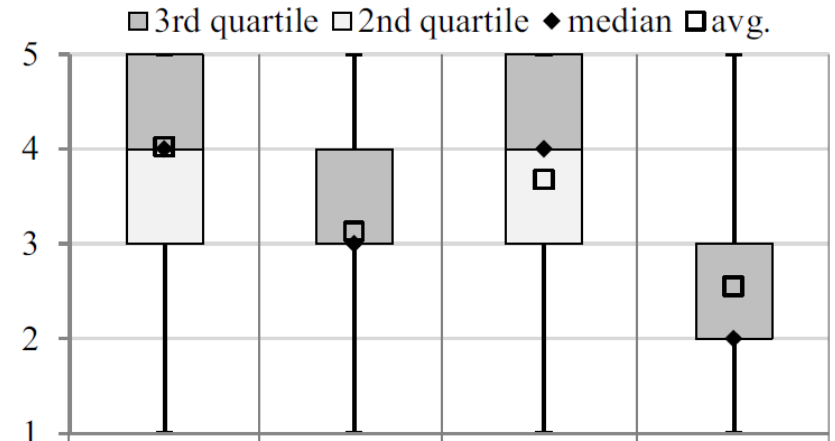
Fig.: Usage and relevance as EA information sources (n=123).



- majority of organizations have no dedicated process for EA documentation defined
- only 23 participants (18.7%) stated that they have implemented some form of automated EA documentation mechanisms for their EA tool
  (mostly limited to simple file import mechanisms that are manually triggered)
- direct data integration between other information systems and the EA tool only considered by few organizations

source:
Farwick, M., Hauder, M., Roth, S., Matthes, F., Breu, R.: Enterprise Architecture Documentation: Empirical Analysis of Information Sources for Automation - In the Hawaii International Conference on System Sciences (HICSS 46), Maui, Hawaii, 2013

2. Research problem (2)



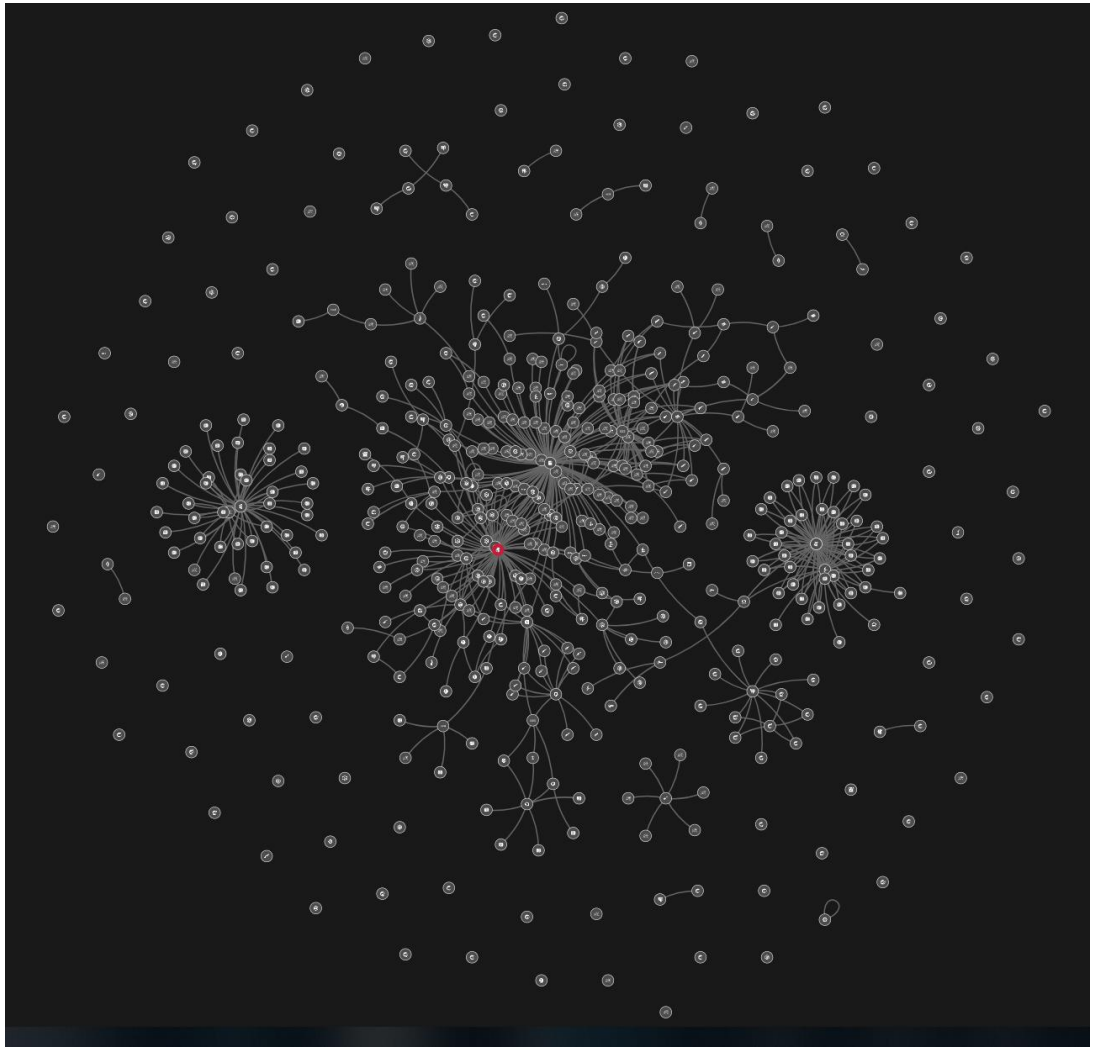
	Actuality	Completeness	Correctness	Granularity
5	19	5	11	2
4	11	9	15	4
3	6	16	7	13
2	3	4	4	16
1	2	5	3	5
-	13	15	14	14

Fig.: Information source quality attributes of Network Scanners (n=54)

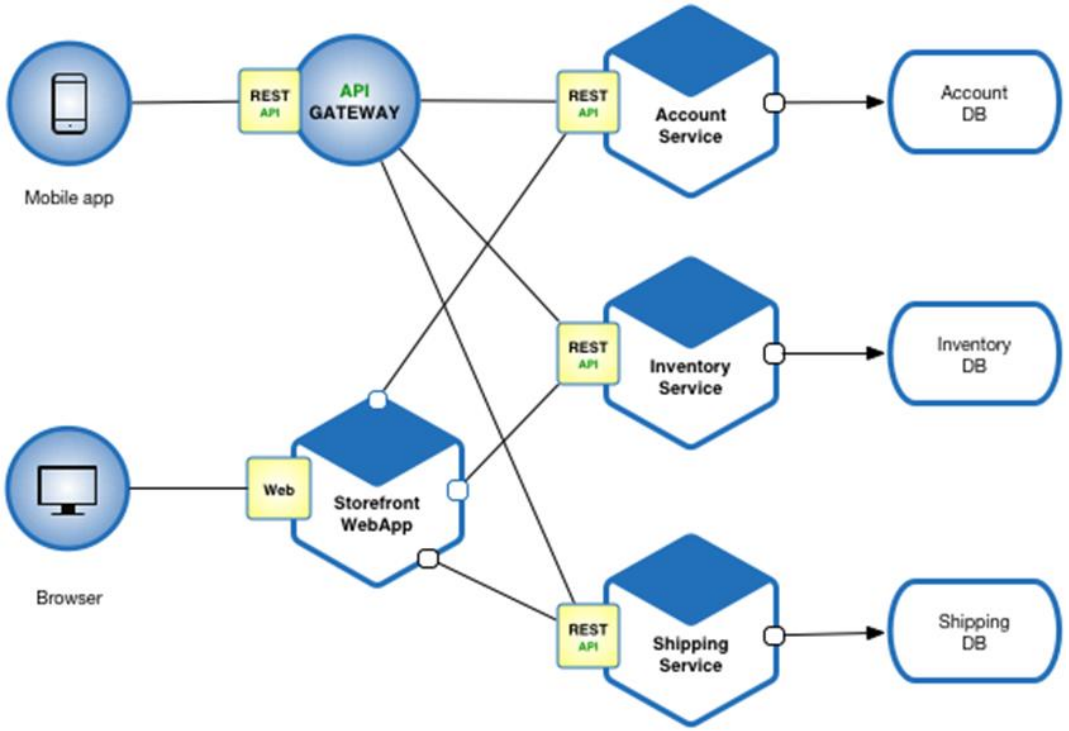
- used to monitor infrastructure and its performance (APM)
- high actuality and correctness
- scope of monitoring tools is too granular
- main problem:
  bridging the abstraction gap between existing information silos and EA tools

source:
Farwick, M., Hauder, M., Roth, S., Matthes, F., Breu, R.: Enterprise Architecture Documentation: Empirical Analysis of Information Sources for Automation - In the Hawaii International Conference on System Sciences (HICSS 46), Maui, Hawaii, 2013

2. Research problem (3)



Smartscape topology



Microservice architecture example

source:
www.microservices.io
MediaMarktSaturn dynatrace Smartscape topology

3. Research Questions

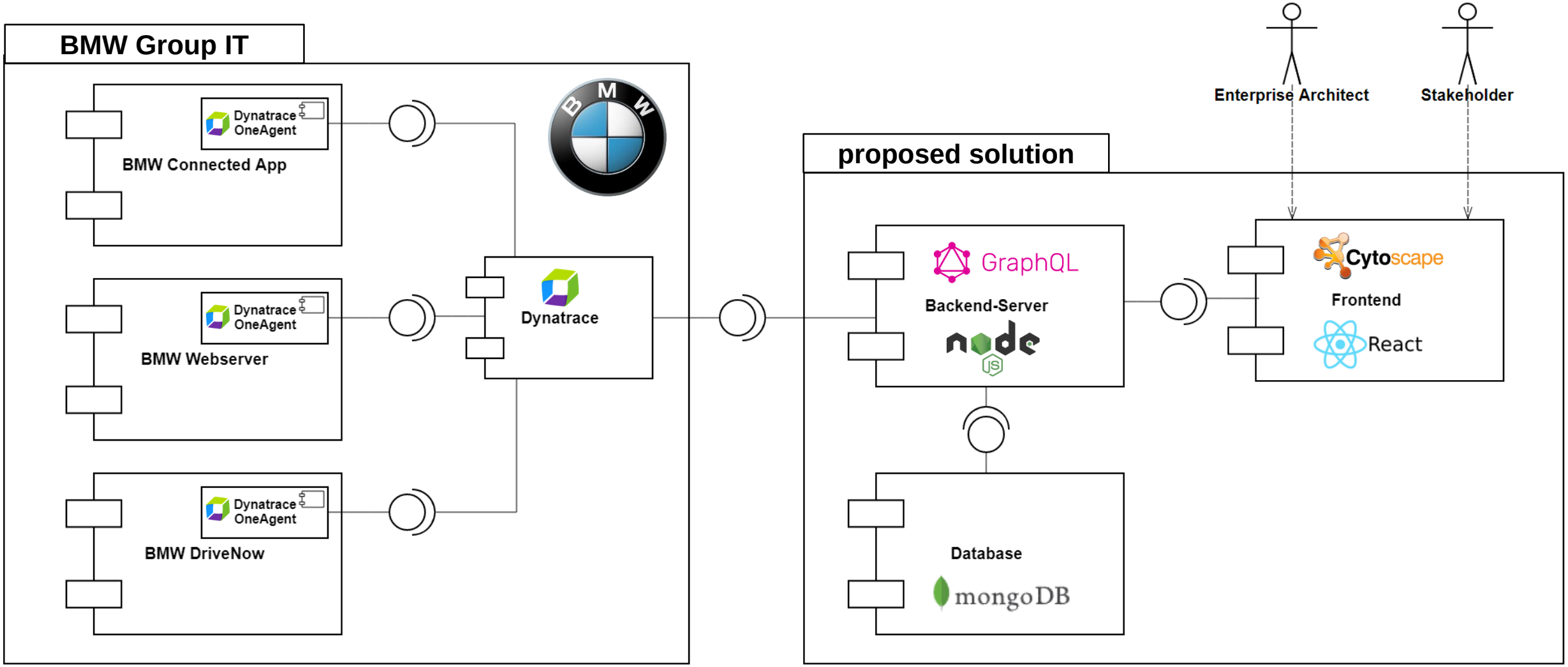
RQ1 Which IT artifacts and their communication relationships can be discovered through runtime data?

RQ2 How can IT artifact relationships be visualized properly?

RQ3 What prerequisites need to be fulfilled?

RQ4 What are benefits and limitations of this solution?

4. Solution proposal



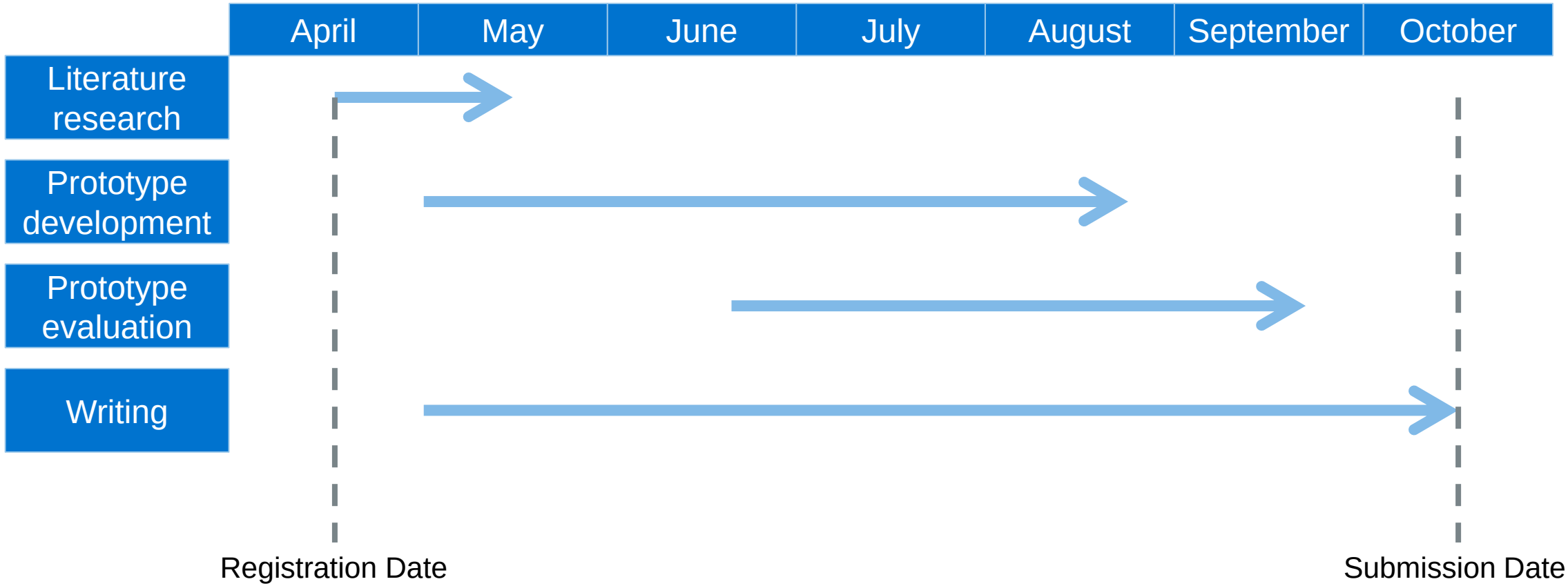
source (logos):
www.bmwgroup.com, www.dynatrace.com, www.nodejs.org, www.graphql.org, www.mongodb.com, www.reactjs.org, www.cytoscape.org

5. Evaluation

Requirements analysis	• Literature research • Interviews with stakeholders	relevant requirements desired outcome
Evaluation design	• Definition of relevant case study parameters (assessment criteria, stakeholders, methods of information gathering)	case study design
As-Is-Evaluation	• Analysis of as-is situation • Data collection from relevant sources	as-is meta-model
On-Site experience	• Implementation of prototype • Feedback from stakeholders • Refinement of prototype	final prototype version
Case Study	• Semi-structured interviews with stakeholders • Gap analysis	updated meta-model relevant research data
Final Assessment	• Critical assessment of benefits and limitations • Final evaluation of research questions	answers to research questions thesis write-up

source (logo): www.bmwgroup.com

6. Timeline


April
May
June
July
August
September
October
Literature research
Prototype development
Prototype evaluation
Writing
Registration Date
Submission Date

Thank you for your attention!

Discussion

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