Can big data systems benefit from microservices patterns ?

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1 Research components:

1. Systematic literature review (following the guidelines of PRISMA and Barbara An Kitchenham)

2. Improved searched strategy by using PRISMA-S

3. Thematic synthesis using Cruzes, D. S. & Dybå approach

4. Capturing microservices patterns following the TOGAF template

5. Understanding the current state of big data architectures

6. Mapping the microservices patterns against big data architectures and see if they can solve some of its issues

7. Discussion

8. Threat to validity

9. Conclusion and further research

2 Timeline:

- two systematic literature review - 1 month (end of June) 10th June - 10th July

- Thematic synthesis (1 week) - 6th July - 13th July

- Capturing patterns in the synthesis (1 week) - 13th July - 20th July

- Critical discussion (1 week) - 20th July - 27th July

- Polish and final edits (1 week) - 27th July - 3rd August

3 Hard Deadlines:

- IEEE Big Data - Aug 20, 2022

- Journal of big data - Aug 30, 2022

4 Chosen Databases:

- IEEE Explore

- ScienceDirect

- SpringerLink

- ACM library

- MIS Quarterly –¿ replace with JSTOR?

- Elsevier

- Scopus

- Aisel

- Wiley? (maybe as an addition?)

5 SLR on Microservices

5.1 Keywords

- at least microservice (or derivates)has to always be in the title:

- microservice* AND pattern*

- microservice* AND architecture*

- microservice* AND design*

- microservice* AND building block*

- microservice* AND best practice*

6 SLR on Big data architecture (following the same methodology by paper published to ACIS (Pouya Ataei - Alan Litchfield) and extend it for the years 2020-2022)

7 Phase 1: search

7.1 Progress report (date):

we have found n number of paper with the following search strategy, and n number has been deduplicated.

8 Phase 2: developing inclusion, exclusion criteria, quality framework

8.1 Progress report (date):

we have found n number of paper with the following search strategy, and n number has been deduplicated.

9 Inclusion and Exclusion criteria:

9.1 Inclusion

- Primary and secondary studies between Jan 1st 2012 and June 19th 2022

- The focus of the study is on microservices patterns, and microsrvices architectural constructs.

- Scholarly publications such as conference proceedings and journal papers

9.2 Exclusion

- Studies that are not written in English

- Informal literature surveys without any clearly defined research questions or research process

- Duplicate reports of the same study (a conference and journal version of the same paper). In such cases, the conference paper was removed.

- Short papers (less than 6 pages)

- We excluded studies in the area of microservice migration from legacy monolithic systems, adaptive microservices systems, and conformance patterns for microservice architecture, microservices architectural smells and architectural debts paper and papers regarding the distribution of microservices to different infrastructure.

10 Phases of the selection

- Pooling literature - DONE

- Duplicate removal - DONE

- Removal based on publication types - DONE

- Scanning studies titles based on Inclusion and Exclusion criteria - In Progress

- Scanning studies abstract and title based on Inclusion and Exclusion criteria

- Scanning introduction and conclusion parts of the studies based on Inclusion and Exclusion criteria

- Assessing the studies based on the quality framework phase 1 (in phase 1, we run the studies against first three questions for minimum quality threshold for all studies, this is done through a questionnaire, and each study must conform to at least 75% of the criteria, while the inter-rater reliability is above 75%), (in phase 2, we run the studies against the second criteria (Rigour), with the exact same statistical condition as the phase 1) (in phase, we run the studies against the third and fourth criteria, with the exact same statistical condition as the phase 1)

- Thematic Synthesis

11 Quality Framework:

1. *Minimum quality threshold:*

   (a) Does the study report empirical research or is it merely a 'lesson learnt' report based on expert opinion ?

   (b) The objectives and aims of the study is clearly communicated, including the reasoning for why the study was undertaken ?

   (c) Does the study provide with adequate information regarding the context in which the research was carried out ?

2. *Rigour:*

   (a) Is the research design appropriate to address the objectives of the research ?

   (b) Is there any data collection method used and is it appropriate ?

3. *Credibility:*

   (a) Does the study report findings in a clear and unbiased manner ?

4. *Relevance:*

   (a) Does the study provides value for practice or research