

# Quality Assurance Plan

The quality of a developed product is influenced by the quality of the production process and good process is usually required to produce a good product. Process quality and product quality are closely related, and process improvement benefits arise because the quality of the product depends on its development process.

**Product Introduction:** The intended product is a researched based report on NO-SQL. The report should be academic style discussion which critically evaluates the technique's value in light of software engineering's inherent problems and concludes by discussing how far the technology does, or does not, go towards supporting the view expressed by BROOKS in the "no Silver Bullet" paper.

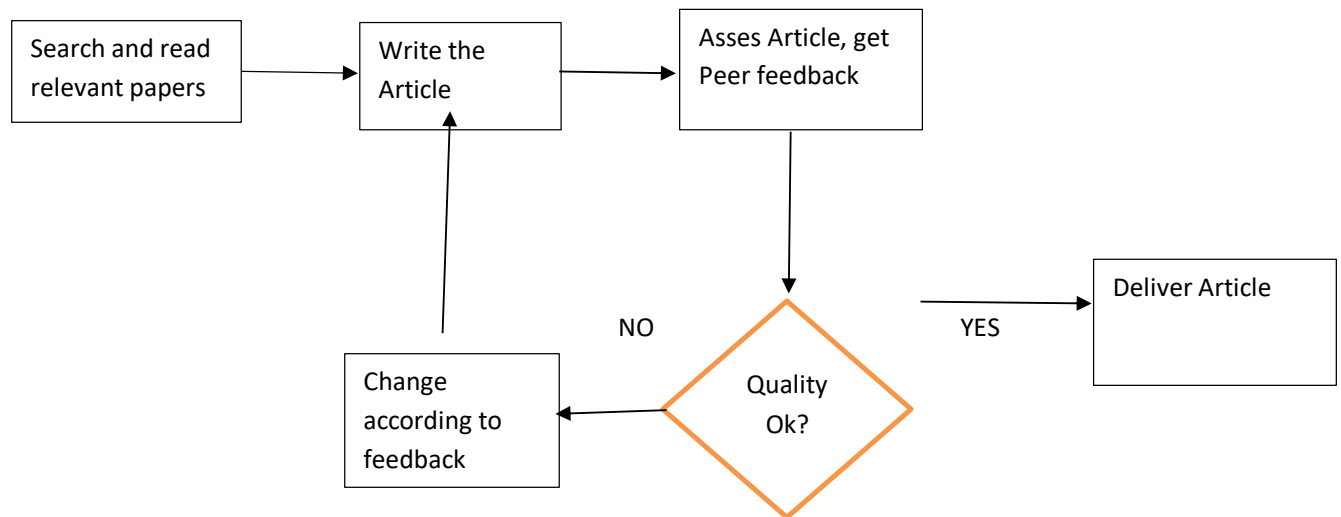
## Product Attributes:

- Typed Document
- Length 1500-2000 words
- At least 5 references
- Harvard style referencing
- Readable no grammatical mistakes
- Relevant to the topic
- Academic style paper
- Format PDF

Goal	Process	Measure
Is there Title	Check the paper to see if there is a Title	Do I have written NO-SQL
Is there author name	Check the paper to see if there is author name	Is author name "waseem syed"
Is there Degree program?	Check the paper	Is It "BSc Hons computer science"?
Is there email address?	Check the paper	Is it "ws9766e@greenwich.ac.uk"?
Is there abstract?	Check the paper	Do I have abstract on the top of the paper?
Is there Introduction?	Check the paper	Do I have introduction in the paper?
Is there Conclusion?	Check the paper	Do I have conclusion with supporting evidence?

Is there Evaluation?	Check the paper	Is there Evaluation with Evidences to support?
Are there references?	Check the paper	Are there at least 5 references?
Are references Harvard Standard?	Check the paper	Peer Review if it is correct style
Does the paper address conformity?	Find and document to support or refute conformity	Do I have at least 1 paragraph discussing Conformity?
Does the paper address changeability?	Find and document to support or refute changeability	Do I have at least 1 paragraph discussing changeability?
Does the paper address complexity?	Find and document to support or refute complexity	Do I have at least 1 paragraph discussing complexity?
Does the paper address invisibility?	Find and document to support or refute invisibility	Do I have at least 1 paragraph discussing invisibility?
Does the paper include appendices?	Check paper	Are there glossaries and acronyms?
Does the paper have length between 1500-2000 words?	Check the paper	Do I have checked on Microsoft word for word count?
Are the requirements fully understandable?	Check the coursework specifications	Do I have consulted the Tutor to see if I have understood them properly?

### Process description:



Need to do research on NO SQL whether it is an answer to BROOK's Silver bullet article or not. Do No-SQL are the "silver bullet" and solve all problems.

1) Survey of material

- a. Specific
  - i. At least Five journals related to No-SQL that say something relevant about one or more of Brook's Conformity, Changeability, Complexity and Invisibility.
- b. Measurable
  - i. Five Journals
- c. Agreed
  - i. Do these journals satisfy academic standards?
- d. Realistic
  - i. Yes
- e. Timebound
  - i. 10 hours

2) Document findings

- a. Specific
  - i. Record a summary of every paper I read using the headings Conformity, Complexity, Invisibility and Changeability.
- b. Measurable
  - i. 150 words for each paper, word processed, with references and quotes.
- c. Agreed
  - i. Yes
- d. Realistic
  - i. Yes
- e. Timebound
  - i. 2 hours

3) Time management

- a. Breakdown the tasks
- b. Assign time to tasks
- c. Monitor progress





























4) Determine layout of the writing

5) Proof reading

- a. Review with peers

<b>Goal</b>	<b>Process</b>	<b>Measure</b>
Produce a Time plan	On Gantt chart produce a time plan and follow it strictly	Are there Times and duration for each activity?
Search academic journals	From University PC search 5 journals	Are there at least 5 relevant journals?
Gather evidence to support the writing	Read each journal and write summary that includes, Complexity, Conformity, Changeability and Invisibility	Are there CCCI headings and 150 words of summary?
Create Paper Layout	Use TexStudio and create layout according to the Paper specification	Are there Abstract, Introduction, Discussion, conclusion, evaluation, appendices in the Paper Layout?
Add Referencing file	Download Bibtex from each Journal and create a reference file in TexStudio	Is referencing in Harvard Style And referencing file is in the same Root Folder?
Write Abstract	In Texstudio write Abstract and compile document to see the output	Does abstract matches abstraction standard for academic writing?
Write Introduction	Open Texstudio Paper document and write Introduction part and compile the document to see the output	Do I have 1 paragraph with quality content in the introduction? At least 1 paragraph
Write Discussion	Open TexStudio and complete Discussion part which includes Complexity, Changeability, Conformity and Invisibility and compile to document to see the output	Do I have covered all parts as per requirement with solid supporting evidence from all journals? At least 1 paragraph for each CCCI.
Write Conclusion	Open Texstudio and write Conclusion part and compile the document to see the output	Do I have written conclusion with evidence which back my point of view? At least 1 paragraph
Write Evaluation	Open Texstudio and write Evaluation part and compile the document to see the output	Do I have evaluated the discussion with supporting evidence?
Produce completed Paper	Open TexStudio and Compile document and save it as PDF	Do I have all Parts as per requirements and Total words count is between 1500-2000 words and it matches with the structure of Example Paper?
Change Control	Open TexStudio, make any change if needed and Create final Pdf and submit on the Moodle	Do I have submitted the File on Moodle in time?

## Gantt chart

Survey Academic Journals			3d	04/11/19	06/11/19	Survey Academic Journals				
Search relevant Academic Journals		Waseem Syed	Search relevant journals, read abstract if they are relevant saved them	4h	04/11/19	04/11/19	<div><div></div></div> Search relevant Academic Journals			
Select 9 most relevant journals		Waseem Syed	Skim through all journals and select 9 most relevant to the topic	6h	06/11/19	06/11/19	<div><div></div></div> Select 9 most relevant journals			
Contingency			10% contingency added	1h	06/11/19	06/11/19	Contingency			
Record Summary			3d	08/11/19	12/11/19					
Read Academic Journal 1		Waseem Syed	journal related to No-SQL that say something relevant about one or more of Brook's Conformity, Changeability, Complexity and Invisiblity.	1h	08/11/19	08/11/19	<div><div></div></div> Read Academic Journal 1			
Record Summary for Journal 1		Waseem Syed	Write summary, with headings CCCI, 150 words	1h	08/11/19	08/11/19	<div><div></div></div> Record Summary for Journal 1			
Read Academic Journal 2		Waseem Syed	journal related to No-SQL that say something relevant about one or more of Brook's Conformity, Changeability, Complexity and Invisiblity.	1h	08/11/19	08/11/19	<div><div></div></div> Read Academic Journal 2			
Record Summary for Journal 2		Waseem Syed	Write summary, with headings CCCI, 150 words	1h	08/11/19	08/11/19	<div><div></div></div> Record Summary for Journal 2			
Read Academic Journal 3		Waseem Syed	journal related to No-SQL that say something relevant about one or more of Brook's Conformity, Changeability, Complexity and Invisiblity.	1h	09/11/19	09/11/19	<div><div></div></div> Read Academic Journal 3			
Record Summary for Journal 3		Waseem Syed	Write summary, with headings CCCI, 150 words	1h	09/11/19	09/11/19	<div><div></div></div> Record Summary for Journal 3			
Read Academic Journal 4		Waseem Syed	journal related to No-SQL that say something relevant about one or more of Brook's Conformity, Changeability, Complexity and Invisiblity.	1h	09/11/19	09/11/19	<div><div></div></div> Read Academic Journal 4			
Record Summary for Journal 4		Waseem Syed	Write summary, with headings CCCI, 150 words	1h	09/11/19	09/11/19	<div><div></div></div> Record Summary for Journal 4			
Read Academic Journal 5		Waseem Syed	journal related to No-SQL that say something relevant about one or more of Brook's Conformity, Changeability, Complexity and Invisiblity.	1h	10/11/19	10/11/19	<div><div></div></div> Read Academic Journal 5			
Record Summary for Journal 5		Waseem Syed	Write summary, with headings CCCI, 150 words	1h	10/11/19	10/11/19	<div><div></div></div> Record Summary for Journal 5			
Read Academic Journal 6		Waseem Syed	journal related to No-SQL that say something relevant about one or more of Brook's Conformity, Changeability, Complexity and Invisiblity.	1h	10/11/19	10/11/19	<div><div></div></div> Read Academic Journal 6			
Record Summary for Journal 6		Waseem Syed	Write summary, with headings CCCI, 150 words	1h	10/11/19	10/11/19	<div><div></div></div> Record Summary for Journal 6			
Read Academic Journal 7		Waseem Syed	journal related to No-SQL that say something relevant about one or more of Brook's Conformity, Changeability, Complexity and Invisiblity.	1h	11/11/19	11/11/19	<div><div></div></div> Read Academic Journal 7			
Record Summary for Journal 7		Waseem Syed	Write summary, with headings CCCI, 150 words	1h	11/11/19	11/11/19	<div><div></div></div> Record Summary for Journal 7			
Read Academic Journal 8		Waseem Syed	journal related to No-SQL that say something relevant about one or more of Brook's Conformity, Changeability, Complexity and Invisiblity.	1h	11/11/19	11/11/19	<div><div></div></div> Read Academic Journal 8			
Record Summary for Journal 8		Waseem Syed	Write summary, with headings CCCI, 150 words	1h	11/11/19	11/11/19	<div><div></div></div> Record Summary for Journal 8			
Read Academic Journal 9		Waseem Syed	journal related to No-SQL that say something relevant about one or more of Brook's Conformity, Changeability, Complexity and Invisiblity.	1h	12/11/19	12/11/19	<div><div></div></div> Read Academic Journal 9			
Record Summary for Journal 9		Waseem Syed	Write summary, with headings CCCI, 150 words	1h	12/11/19	12/11/19	<div><div></div></div> Record Summary for Journal 9			
Contingency			10% Contingency	1.40h	12/11/19	12/11/19	Contingency			
Start Writing Academic Paper			5d	13/11/19	19/11/19	Start Writing Academic Paper				
Create Layout		Waseem Syed	In TexStudio create academic style layout	1h	13/11/19	13/11/19	<div><div></div></div> Create Layout			
Write Abstract		Waseem Syed	Write Abstract	1h	13/11/19	13/11/19	<div><div></div></div> Write Abstract			
Write Introduction		Waseem Syed	Write introduction	1h	14/11/19	14/11/19	<div><div></div></div> Write Introduction			
Write Discussion		Waseem Syed	Write main body. Discussion and give headings according to CCCI	5h	14/11/19	14/11/19	<div><div></div></div> Write Discussion			
Write Conclusion		Waseem Syed	write conclusion	1h	16/11/19	16/11/19	<div><div></div></div> Write Conclusion			
Write Evaluation		Waseem Syed	write evaluation	1h	16/11/19	16/11/19	<div><div></div></div> Write Evaluation			
Write References		Waseem Syed	Write references Harvard standard	1h	17/11/19	17/11/19	<div><div></div></div> Write References			
Write Glossary and Acronym		Waseem Syed	write glossary and acronym	1h	17/11/19	17/11/19	<div><div></div></div> Write Glossary and Acronym			
Read Paper		Waseem Syed	read paper and match with the Example Paper if any thing missing change it accordingly	4h	18/11/19	18/11/19	<div><div></div></div> Read Paper			
Contingency			16% Contingency	1.36h	18/11/19	18/11/19	Contingency			
Submit			1h	20/11/19	20/11/19					
		Waseem Syed	Save PDF from TexStudio and submit the file							

## Risks and risk management

### RISK ASSESSMENT

#### RISK IDENTIFICATION

Risk	Affects	Description
Pc breakdown	Project	Pc is a machine so there is probability of breakdown
Project File corruption	Project and Product	MS Word file on which we are working can get corrupted
Grammatical Mistake	Product	There will be grammatical mistake in the product
Spelling Mistake	Product	There will be spelling mistake in the product
Word Count mistake	Product	There will be less or more word counts compared to requirement
Structural Mistake	Product	There will be mistake in overall structure of the product(paper)
Irrelevant Papers	Project	There will be irrelevant papers reading that can delay project, waste of time
Referencing	Product	There will be wrong referencing style in the paper
Illness	Project	Health issues, sickness
Other Time-consuming activities	Project	Other course works and time-consuming works will affect the project
Requirements misunderstanding	Product	Requirements are not clear or misunderstood
Under-Estimation	Project	Project timings are underestimated
Internet Failure	Project	Internet service provider suspended service due to unforeseen reasons
Server breakdown	Project	University Web server will breakdown and product submission will delay

#### Threat Profile Chart:

Threat	Class of Threat			Type of Threat		Unacceptable Even				Asset Affected		Responsible	
	Technical	Personal	Theft	Accidental	Deliberate	Interruption	Disclosure	Modification	Destruction	Hardware	Product	intruder	Provider
Bug	X			X		X	X	X			X		
Theft			X		X	X	X			X	X	X	
Breakdown	X			X		X	X	X		X			
File corruption	X			X		X	X	X	X		X		
Illness		X		X		X							
Internet failure	X			X		X							X

### RISK ANALYSIS

Risk	Probability	Effects
Illness	Moderate	Serious
Under-Estimation	Moderate	Serious
File Corruption	Low	Catastrophic
Pc breakdown	Low	Catastrophic
Grammatical Mistakes	Low	Tolerable
Spelling Mistakes	Low	Tolerable
Structural Mistakes	Low	Serious
Irrelevant Papers	High	Insignificant
Other Time-consuming activities	Moderate	Tolerable
Requirements misunderstanding	Low	Catastrophic
Internet Failure	Low	insignificant
Referencing	Low	Serious

### RISK PRIORITISATION

Risk	Probability of loss	Size of loss (hours)	Risk Exposure (probability*impact)
Other Time-consuming activities	40%	20	8 hours
Illness	30%	20	6 hours
Irrelevant Papers	50%	10	5 hours
Pc breakdown	10%	10	1 hour
Under-Estimation	10%	5	0.5 hour
Structural Mistake	20%	2	0.4 hour
Word Count mistake	30%	1	0.3 hour
Grammatical Mistake	20%	1	0.2 hour
Spelling Mistake	20%	1	0.2 hour
Project File corruption	5%	1	0.05 hour
Referencing	5%	1	0.05 hour
Internet Failure	5%	1	0.05 hour
Server breakdown	5%	1	0.05 hour

# RISK CONTROL

## Risk Management Planning

Risk	Strategy
Other Time-consuming activities	Make a suitable Timetable for all other activities and complete them according to their deadlines. Make a Plan for each Coursework
Illness	Take care of your health, healthy diet and weekly workouts
Irrelevant Papers	Read abstract of each Paper if they are relevant and allocate extra time for irrelevant papers in Project planning so it wont affect the Project deadline
Pc breakdown	Save coursework on GitHub and on external USB drive
Under-Estimation	Check daily, time management chart and see if everything is going smoothly and update estimate time.
Structural Mistake	Make Paper Structure on TexStudio and match with Example paper and Coursework specifications
Word Count mistake	Check word count after every activity and have overall look on the project to distribute word count to all parts of paper, equally
Grammatical Mistake	Use Grammarly to correct grammatical mistakes
Spelling Mistake	Use Grammarly for Spelling mistakes
Project File corruption	Copy file on USB and git hub, to be on the safe side in case file get corrupted
Referencing	Check Harvard referencing, On TexStudio use appropriate package for referencing
Internet Failure	Save Mobile Data in case ADSL Net is not working, then use mobile data
Server breakdown	Upload file several hours before deadline to avoid any mishap

## Version Control

Use Version control which will allow us to manage changes over time. We can track revisions of our project's assets. Use Git for version control it is good option for small teams when Project will progress, we need to manage multiple versions of the product. It will minimize risks because all changes will be trackable, and the product can be recovered in case of any Risk or threat mentioned above.



# NO-SQL

Waseem Syed - BSc Hons Computer Science  
ws9766e@greenwich.ac.uk

November 20, 2019

## 1 Abstract

Brooks (1987) illustrates that there are four components that make software engineering hard and these are complexity, conformity, changeability and invisibility (CCCI). He says, “Building software will always be hard. There is inherently no silver bullet.” (Brooks, 1987). Brooks outlined these four problems in software engineering about 30 years ago and this paper aims to find out if, since then, NO-SQL is a silver bullet. The discussion in this paper will be investigating what NO-SQL is doing to tackle Complexity, Conformity, Changeability and Invisibility (CCCI), features of No-SQL databases and look to see how they affect the problems, whether positively or negatively.

## 2 Introduction

No-SQL database stands for “Not Only SQL” or “Not SQL.” No-SQL databases arose in response to those limitations of SQL. No-SQL systems store and manage data in ways that allow for high operational speed and great flexibility on the part of the developers. No-SQL is a non-relational database management system, that does not require a fixed schema, avoids joins, and is easy to scale. No-SQL database is used for distributed data stores with humongous data storage needs. Many were developed by companies like Google, Amazon, Yahoo, and Facebook that sought better ways to store content or process data for massive websites. Unlike SQL databases, many No-SQL databases can be scaled horizontally across hundreds or thousands of servers.

Tang & Fan (2016) says that nowadays there are more than 225 No-SQL databases according to the real-time statistics and different No-SQL databases have different implementation mechanisms, storage characteristics, configurations and optimization methods, which brings more challenges in No-SQL selection. In this paper we try to test No-SQL performance to give suggestion to anyone who need to select No-SQL in different application scenarios.

There can be a lot of small entities in a software system which adds to the complexity of its nature. In big software systems, there are inherently many

entities, therefore the system is very complex. This paper will make an investigation into No-SQL to see whether complexity reduces. Software systems also need to conform to specification and laws. This means that the specification of the system needs to be understood and know exactly what the end user requires otherwise the system is a failure because there could be requirements that are not implemented. The need for systems to change is huge in the modern world. Changeability is partly down to failing systems but also due to consumer/customer demand. Consider a mobile application. If that mobile application has a bug, a software engineer can update the application to remove the bug without the customer/consumer having to return a physical item. Software systems, in terms of the coding and design, is invisible.

When it comes to building a wardrobe, one can follow a process by viewing diagrams. These diagrams relate to physical things such as nails and screws. This makes it easier for the person building the wardrobe to visualise how it all comes together. When it comes to software, there are UML diagrams to help one visualise a system. When working on large system, these diagrams are complex, need to conform, need to change to meet new requirements and are invisible.

## 3 Discussion

### 3.1 Complexity

Lombardo et al. (2012) explains the problems faced by using a No-SQL as the main data storage. Most importantly how to flatten a complex data model and how to manage the execution of complex queries. A No-SQL DB is mainly organized in uncorrelated tables. Thus, a complex and intrinsically relational data model has to be flattened and partitioned in various No-SQL tables. Two different partitioning policies are possible, vertical partitioning, where each column of a high level relational table is stored into a separate No-SQL table and horizontal partitioning, where different tuples are stored in No-SQL tables. To manipulate and retrieve data, database administrators are given a primitive set of commands. Complex business functionality requires significant amount of design and programming to implement, although simpler business models may be able to suffice with the primitive command set supplied.

In software projects, the reduction of complexity may be aided by use of No-SQL depending on the functionality required from the database itself. No-SQL database is schema free, which means that we don't to define the fields of a table in advance.

Tang & Fan (2016) divide No-SQL into four categories: key-value, document store, column family store and graph database. He did experiments on databases and he concluded that all databases have their limitations, some are good in loading and executing workloads but some don't have good average performance. Burtica et al. (2012) says that Google has demonstrated, a shared-nothing system scales faster, because adding new nodes will not create bottlenecks or slow

down the system. This system also increases the availability of the system, since there is no single point of failure. This model is called sharding.

Mohamed et al. (2014) explains that complexity in relational databases is higher and No-SQL databases have the capabilities to store unstructured, semi structured or structured data. It seems trade between complexity lays within the system, rather than how much complexity there is. It is important to consider what is functionality is required from the database when choosing a database system, in order to reduce the complexity which the developers will face.

### **3.2 Changeability**

Changeability is an expected behaviour of a software and successful software adapt to its any change. Chandra 2015 explains the characteristics of No-SQL and one of them is Schema-less, like Key-value stores, so new values can be added at runtime without affecting any other data stored.

Hecht & Jablonski (2011) says that due to very simple data structure, key value stores are completely schema free. New values of any kind can be added at runtime without influencing system availability. No-SQL databases allow insertion of data without having predefined a schema for the database to adhere to. This complements agile methodologies in software projects well. It allows focus on the design and adapting to changes in the software, rather than the schema which supports the data. In SQL making any changes require a change in the schema, requires the schemas to be modified first and for the database to be migrated to the new schema. This may require a migration project in order to complete schema changes. Database schema migration can involve writing change scripts which need to be written from scratch for each change and this fits in poorly with the ideals of agile methodology, including the aim to meet rapidly changing requirements.

No-SQL's dynamic schema supports frequency and speed of change in a positive way. Changes in databases can be done quickly, scaling well with the size of the change to be made while having the capability to avoid down-times with the service and without the need of any scripts or migration projects. The changes can be made simply and effectively. This helps to reduce the effect of problems encountered due to the required and expected changeability in software.

### **3.3 Conformity**

In software engineering all software systems must conform to laws and processes, different standards and formats. There are other systems and environments in place such as externalised APIs, which the system needs to conform to. As we know that Databases are created with the goal of storing data, it is important for such technologies to conform to the Data Protection Act, which specifies a multitude of factors to ensure data security. No-SQL's enhanced ability to adapt to changes means that it is more suitable to conforming to sets of changing standards or requirements compared to RDBMS.

### 3.4 Invisibility

Unlike RDBMS, in No-SQL we don't make Entity Relationship Diagrams so visualisation of a No-SQL database model is difficult because it lacks explicit schema. On the other hand RDBMS make use of ERD to diagrammatically represent its schema. UML Class Diagrams have been proposed and used as a way of constructing representations of No-SQL schemas. Delfosse et al. (2012) has suggested how to map a graph store database to UML Class Diagrams but it does not tackle the problem of possible inconsistency throughout the database. It can be said that RDBMS is superior in this aspect. The strict and rigid schema provides a useful way of representing the data storage model. Opposing this to No-SQL which is inconsistent, making it difficult to meaningfully convey the model in a diagrammatic format.

## 4 Conclusions

No-SQL databases are becoming a major part of the database landscape today, and with their many advantages, they can be a real game changer in the enterprise arena. Lower cost, easier scalability, and open source features make No-SQL an appealing option for many companies looking to integrate in Big Data. However, No-SQL is still a relatively young technology without the set of standards that SQL databases like MySQL offer. As with any major business decision, IT leaders need to weigh their options and determine what features are most important to them in a database. Some suggest that No-SQL is the way of the future. It is obvious that four inherent problems of software engineering not completely solved with introduction of No-SQL. We can notice that dynamic nature of No-SQL favours changeability, but it comes on cost of its invisibility. In terms of CCCI, No-SQL reduced complexity compared to complexity of RDBMS. No-SQL does not support strong encryption and security features. Invisibility is still an issue and always will be because software is not something you can touch. Invisibility increases as complexity rises. Its enhanced ability to adapt to changes means that it is more suitable to conforming to sets of changing standards or requirements compared to RDBMS. One should consider the requirements of the system when decide which database to use. At the end of the day, the choice between No-SQL and SQL depends on the complex business needs of an organization and volume and variety of data it consumes. No-SQL as a technology by itself, does not serve to be a "silver bullet" which Brooks Jr. proposed and does not appear capable of becoming one in the near future, due to its schema-less nature. A single No-SQL database does not tackle CCCI but a Hybrid Database system of MySQL and No-SQL can be used as suggested by Ongo & Kusuma (2018).

## 5 Evaluation

No-SQL does make progress to finding the silver bullet for software engineering, but it is clear the four components are always found together when trying to tackle an individual component. For example, when complexity increases then invisibility increases too. This is just one example of how they are all linked together. As there are positives and negatives for No-SQL, it cannot be a silver bullet because there are negatives. Hecht & Jablonski (2011) suggests that "Use the right tool for the job" is the slogan of No-SQL, because every No-SQL database is specialized on certain use-cases. First of all, we have to evaluate their data in order to identify a suitable data model to avoid unnecessary complexity due to transformation or mapping tasks. Queries which should be supported by the database have to be considered at the same time, because these requirements massively influence the design of the data model. Since there isn't any common query language available, every store differs in its supported query feature set. Then we have to trade between high performance through partitioning and load balanced replica servers, high availability supported by asynchronous replication and strict consistency. Beside these different requirements, also durability mechanism, community support and useful features like versioning influence the database selection. In general, key value stores should be used for very fast and simple operations, document stores offer a flexible data model with great query possibilities, column family stores are suitable for very large datasets which have to be scaled at large size, and graph databases should be used in domains, where entities are as important as the relationships between them. So we can deduce that No-SQL are not Brooks "Silver Bullet". A silver bullet would "cure" software engineering from all negatives of CCCI.

## 6 Future Work

For future work on this subject, there could be an investigation into schemas and a redesign of the databases will be required, meeting both the advantages provided by No-SQL and RDBMS databases.

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## **7 Appendices**

### **Acronyms**

**CCCI** Complexity, Conformity, Changeability and Invisibility. 9, 12, 13

**ERD** Entity Relationship Diagram. 12

**RDBMS** Relational Database Management System. 11–13

**UML** Unified Modeling Language. 10, 12