

Best practice in the development of an appropriate and effective database system

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ABSTRACT

This paper views the Best practice in the development of an appropriate and effective database system; which includes the problem specification, importance of the research and the research questions. Also, it will talk about the theoretical framework of the database. Rigor of literature review. The methods of development very well maintained and effective database and how to analyze them in the real environment. Finally, I'll be giving examples of the real time database efficiency then will be concluding the paper by giving some future solutions and how to can manage the coming hugeness of data.

1. Introduction

Database systems are the organized body of related information for a collection of the data for the more extended period. Database systems are in most cases designed to allow the use of the software that is responsible for controlling the retrieval of the information and the information storage. The information systems should have large storage capacity and allow the multi-usage. Database systems should have the fast way of retrieving the information. The information in the systems has to be safeguarded entirely to avoid the unauthorized intruder invading the systems (Lin et al. 666). In the development of the systems, the backup and recovery of data also have to be taken into consideration. The companies end up having the inappropriate database that does not meet their demands, because of the wrong habits while developing and designing the database system.

2. The importance of the Research

Poorly designed and developed database systems, caused a lot more harm to the organization. The bad had bits during the developmental stage of the information system, poses a big challenge and resulted in the un-effective system. When the systems are not well put in place, the security and the integrity of the company's information will be at a significant risk of being interfered with or destroyed. This research clearly elaborates on what practices, the companies should consider while developing a database system that is appropriate for their functions. The useful data systems should have the independence of the information stored; the accessibility of data should be efficient. Data integrity and security should be the top priority when it comes to the information systems. The database administrator should have a clear and good understanding of the undertaking the information resources and the needs, to ensure proper coordination of all the activities in the database systems (Lin et al. 152). Through this research, the database designer will appreciate the ways and procedure adopted for the crash recovery of data, for great and appropriate database practices.

3. Research Question

The primary research question under investigation was, what are the best practices in the development of suitable an appropriate database system? The database system was a broad area of study, but in this research, focused on coming up with the best exercises during the development of database systems to meet the demands appropriately.

4. Theoretical Framework

The wrong practice in developing the database systems was the main problem under the study. The worst method in coming up with database system occurred when the systems designer did unnecessary complex and information was tampered with through many tricks. During development of appropriate systems, the designer was to be keen on the complexity of the database (Jukic et al. 23). Because the more unnecessary complexity, led to confusion and mishandling of the information, by all users. It was not a good practice to develop a system that allowed the scattering of the related information over various tables. The table was responsible for holding the information in a structured format within the database. Any design that did not take consideration of the information in different tables resulted in the ambiguity and inconsistency of data in the database. The systems are rendered inappropriate due to the wrong linking of the data in database systems.

The hidden information in the database system rendered the practice during the development to be wrong. The missing information in the system occurred as in the sequence of columns in the table. The database systems had high number of mistakes. The companies had to make sure that the designer of the information systems made the systems with the information well linked to avoid the hidden information. The systems that continued to have the dark information, they were prone to the systems crash (Walther & Jens 715). These were a huge setback in managing the data systems, and it led to high cost of rectification and maintenance the database systems.

The ineffective database system was the system that was slow in storing the information and also sluggish in retrieving the information stored in the system. The slow system

reduced the activity of the organization (Johnson et al. 48). All transactions had to be quick as possible, so the slow systems cause a long time in the execution of the functions of the organization. The database that was very inflexible caused some hardship in its extension to handle the emerging real-life situation.

5. Literature Review

Different people have always different taste and preference. They perceive the best practice in different dimensions when it comes to the database systems. But there was a generalized good practice that was considered for systems with the standard language for storage of the information, modification of information the system, and retrieving of information for users. Structured Query Language was the standard language for programming and designing the database systems (Jukic et al. 340). The database always had to have the primary key. It was a requirement for the systems to be relational, by having the primary key which was given preferential status for some reasons. It was advisable that if you had a table with many rows that had a relationship with an entity, a unique identifier for the object was maintained. These ensured the integrity of the data is highly protected (Jukic et al. 722). The column names suffixes and prefixes had to be harmonious uniform. These made it simple for implementation of automated generation structured query language.

Following the normalization process strictly and paying keen attention to the design architecture of the database system was considered to be the best practice (Jukic et al. 201). When a database was in use, it was, in turn, and costly to modify the systems. Well, normalization process had to make domains known, thus they were easily mapped to objects. The usages of the spreadsheets in the database as the tables were discouraged for the betterment of the normalization. The untested change to the database that was already set-up was prohibited, for it may have led to a loss of the data or damages the information in use. It was advisable to maintain primary standard language for programming and to avoid the addition of new features for user and debugging (Kerzner, Harold 367). These depended on the need to practice different relational database management systems. Some people argued that if you had not to change the database management systems, then you could utilize the power of the database. The best practice in this scenario was to consider if vendor-specific extensions were to be used keenly.

When the database was big enough to store huge amount of information, another separate device had to be used for indices (Coronel et al. 275). The Column identities that were too long in the data, had to be balanced with the too short columns in the system. The columns that were too long had contained too many words and were hard to read; the column that was too short, they were very difficult to differentiate and make meaning out of them. It was always sensible to use a correct, meaningful name for columns.

The construction of the information system was comprised of many components, which arranged themselves into technical structure systems. The layered information in the database was managed independently, by some firms to avoid

any loss of information through multiple interconnections (Toga et al. 488). Database design and development was the fountain of the excellent database management systems. The database development was continually evolving to meet the emerging demands of the users, the organizations and the world at large. Changes to the centralized database systems had to be practiced ensuring that the information was protected.

6. Methodology

A web-based survey was created to obtain the indication of current good practice in the development of the database system (Vollath et al. 322). The primary study question was: "what are the best practices in the development of suitable an efficient database system?"

The data collection for the survey was between, 22nd March 2018 and 30th April 2018 and a total of 600 respondents participated from global database professionals.

The questionnaire comprised 40 questions of different kinds, including multi options answers, nominal and free text question which allowed the participants to express their views. The inconsistencies in survey response were taken care off by methodological triangulation of the data, to ensure that the responses were reliable.

7. Findings

The survey investigated the current practice in the development of the database development and the respondent "best practice." The major areas of investigation comprised of understanding of the best practice; design and development, database technical practice, database architecture; data management. The findings for each section were discussed in details.

8. Best practice

The meaning of the best practice varies from one individual to the other. The respondents had various options to choose from as the best definition of the "best practice" the "recommended practice" was highly preferred What is the "best practice" in development of an efficient database system?

Definitions	No of respondents	Percentage (%)
Procedure to follow	102	17
A standard everyone follows.	69	12
Vendor supported operation	34	6
Recommended practice	256	43
Don't know	23	4
Rules to comply with	37	6
Integration of the knowledge	69	12

43% of the respondents suggested that the term "best practice" suited well "the recommended practice". The additional respondent responded that the best practice in the development of the appropriate database systems was that the

best practice should be the one that is flexible. The best has to bring out the best every day.

The guideline for the responses by the respondents was from different sources including books, presentations, organization procedures, software vendor's website, user groups, and blogs.

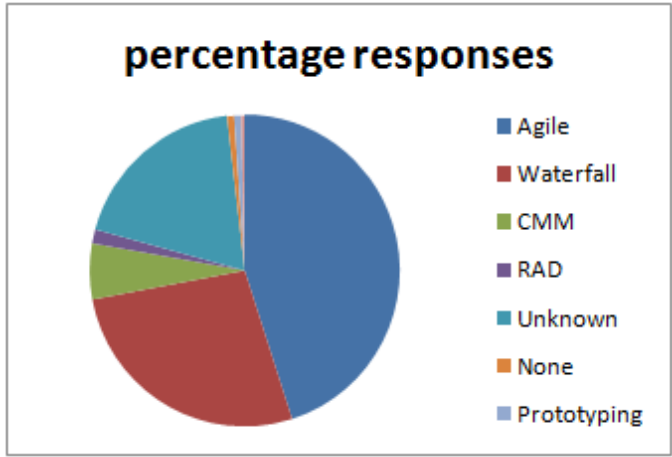
9. Design and development, database architecture

Does your company use any of this framework designing and development of the database??

From the results collected, it showed that 53% of the respondent did not use the standard architectural design for development of the database systems.

The column bar for the results: In On-line transactional process relation design and the data warehouse, the respondents confirmed that some process was being followed. What are the methodologies followed during the development of the database systems?

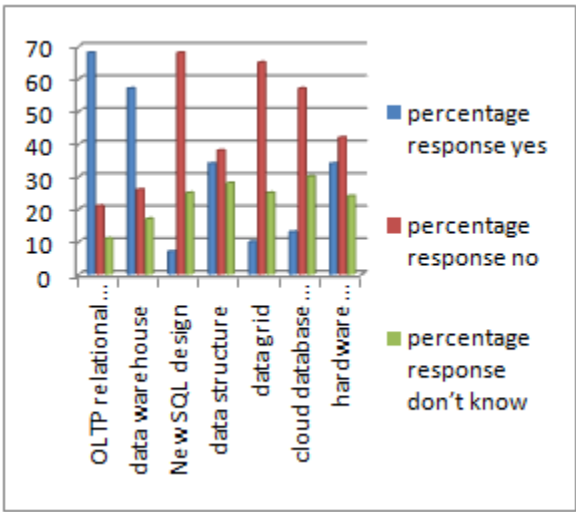
Methodologies followed	Percentage responses
Agile	62
Waterfall	37
CMM	8
RAD	2
Unknown	26
None	1
Prototyping	1
Don't use	0.5



CMM – capability maturity model
RAD – rapid application development

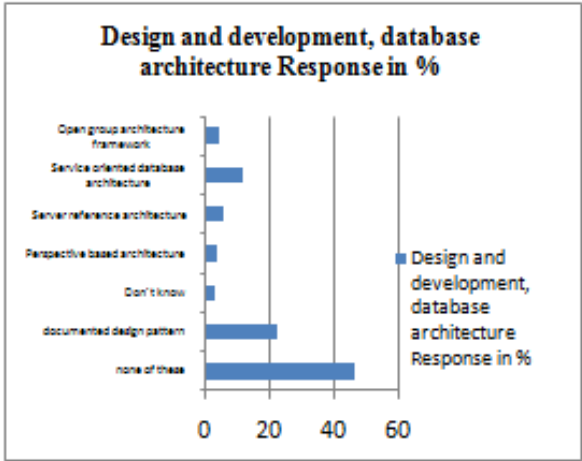
The figure above shows how the development methodologies were followed by the respondents. Agile was the most preferred methodology followed during the development of the database system (62.0%). The waterfall methodology was second with the 37.0%. Some organization adopted the methodologies that were very secretive, even to there some of the employees. The unknown methodologies accounted for 26.0 percent. A very small percentage of the respondents didn't follow the methodologies ithe n the development of the database.

Design and development, database architecture	
Architecture design	Response %
none of these	47
documented design pattern	23
Don't know	3
Perspective-based architecture	4
Server reference architecture	6
Service-oriented database architecture	12
Open group architecture framework	5



Documented design pattern architecture (23%) was most preferred followed by the service-oriented architecture (12%) while the big percentage, advocated

For the other methods other than the listed (none of this 47 %) Were they any process that was followed during design stage?

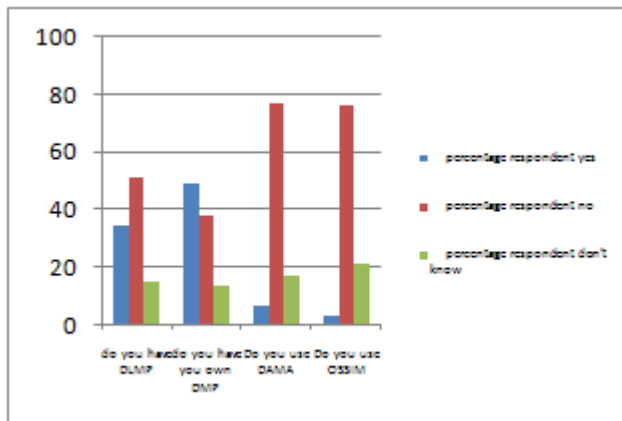


Design process	Percentage response		
	Yes	No	Don't know
OLTP relational design	68	21	11
data warehouse	57	26	17
New SQL design	7	68	25
data structure	34	38	28
data grid	10	65	25
cloud database design	13	57	30
hardware manageability	34	42	24

10. Database management

The respondents were asked how best they practice in managing the database for the effective use of the systems.

The figure below shows the response for the practiced used for data management versus the percentage respondent.



DLMP – data lifecycle management policie

DMP- data management practice

DAMA - data management association framework

OSSIM – open-source standard for information management

51% of the respondents did not follow data lifecycle management policies. The respondent also reported that they did not like the practice of data management, in data

management association framework 77% and open source for information management 76%. Furthermore, 49% of the respondents highlighted they had their own data management practice for the database systems.

11. Conclusion

There are various types of the best practices during the development of the database systems. The best practices are advancing, from time to time, while others are being modified to suit the appropriateness of the database systems requirements. From the findings, the different companies tend to adopt different database systems to suit their demands. Every database systems had it is own best practice methods. The considerations were taken into account while developing and exercising the database management. The misuse of the exercising methods during the development of the database resulted in the ineffective information systems. The companies had to make sure that the best practices are adhered to for the appropriate system. The best practices had to be in standard form, for the development of the database systems. During the development of the database system, every process that was undertaken had to be normalized, for the effective information system. The misuse or mishandling of the database had to be prohibited to safeguard the information integrity (Walther & Jens 523). Best practice the es in the development of the database system produced the appropriate and effective information system.

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