

Database Systems

Guide to Best Practice

"If you always do what you always did,
you will always get what you always got"

Albert Einstein



The Guide

Database Systems provide the foundation stones for creating intelligent action. The management of these database systems are a critical part to many organizations. In addition the growth in the volume, variety and velocity of data has exacerbated the need to have innovative ways to manage this data. The term best practices are continually disseminated as the best way to manage these various configurations, layers and dependencies.

This guide helps to demystify what are the key areas of best practice, to be considered when managing database systems. The database system is explained and best practice challenges identified. This guide reveals the working cogs of best practice derived from the academic research before the revolutionary transformation of best practice, with a 360-degree approach is shared.

Database Systems

A database system is a holistic system which contains many elements: the database software; various database engines types; a plethora of technical features; storage of the data; data management; secure data protection; analytics; visualisation of all data; applications; end user interactions; cultural factors and end-to-end lifecycle tasks interlinking across teams, stakeholders and organizations.



The main technical areas connected to managing database systems are:



Administration

Availability, Recoverability, Reliability, Secure, Performant



Development

Languages, Applications, DevOps



Business Intelligence

Data Warehouses, Cubes, Data Quality, Master Data Management, Data Ingestion, Data transformation, Data Mining, Data Wrangling



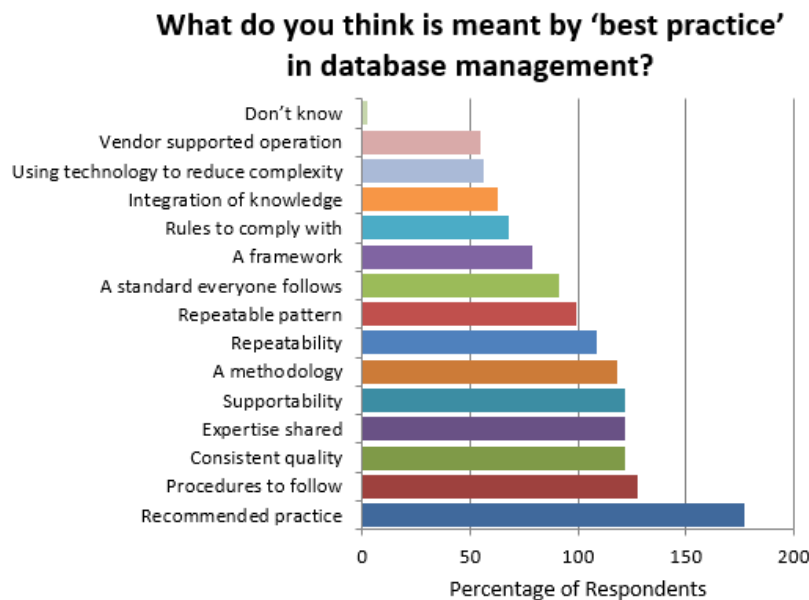
Data Science

Predicative Analytics, Artificial Intelligence, Machine Learning, Deep Learning

Visualisation of Data

Challenges of Best Practice

The challenge that comes with using the word best practice is in its definition and how best practices are used.



Percentages do not total 100% because respondents could check all that apply

Holt, V. et al. (2015)

Varying best practice usage cases:



Process or a methodology

“A best practice is simply a process or a methodology that represents the most effective way of achieving a specific objective.” Dani et al. (2006)



Practices that are truly best but can replace critical thought

Best practicism is the errant belief that there are really certain practices that are truly “best” and that replicating another organization’s processes, strategies, and ideas within your organization will somehow miraculously yield a better reality or even leadership status. Best practices are not all bad, but when best practices become a crutch that replaces independent critical thought and innovation, it can have deleterious impacts on an organization.” Sanwal (2008)



Exemplary practices that are customised

“Those practices that have been shown to produce superior results; selected by a systematic process; and judged as exemplary, good, or successfully demonstrated. Best practices are then adapted to a particular organisation.” Jarrar & Zairi (2000)



Displacing accountability for effectiveness

“Best practice is flawed because it acts as a placeholder for proper management practice, displacing accountability for effectiveness and fit.

Best practice is flawed, further, because it supplants strategy, adopting solutions out of convenience or copying them reactively, and supplants innovation, allowing “the best we know about”, “the best we’ve come across”, or even “the best we’ve done before” to be adequate. Best practice considers the world predictable, and discounts the emergence of better, novel ideas.” Falconer (2010)



Used in value judgments

“The suggestion that an organization does or does not adhere to best practice is used in value judgments and is thus also a political weapon. Concepts like best practice help drive IS management fads and fashions, these in turn fuel a bandwagon effect” Wagner, Scott & Galliers (2006)



Confused and contested

“Best practice can be problematic and is a confused and contested concept.” Holt (2017)



Recommended practice

“A working definition for best practice is a recommended practice for carrying out actions for desirable outcomes, rather than always being the best way of doing something. Best practices are defined by the owners of a particular task. In the end-to-end management of database systems there can be many stakeholders who set these best practices and thus conflict may arise from their different perspectives.” Holt (2017)

The Working Cogs of Best Practice

Best practice has many components that are connected. The components permeate multiple disciplines, from management through to technical areas, whilst also considering the fast moving environmental changes. For the effective utilization of best practice all elements within the cogs need to be taken into account.



Each of the five cogs plays an important part in best practice. The findings are summarised for each cog.



People

Best practices are created by various stakeholders who control how certain tasks are carried out taking account of staff changes..



Conditional

Best practices are created by experienced people who have expertise in a particular area of database systems. These skills require continual learning to maintain the required level of expertise.



Environment

Changing technology, the changing market place, business needs and people skills need to be considered.



Limitations

The meaning of best practices is conflicted and contested. Confusion sometimes occurs about which best practices to follow and best practice can cause conflict between teams where tasks overlap or are connected. Best practices can constrain and stifle innovation.



Outcome

Following best practice can be effective, providing consistency and simplicity are considered whilst understanding the need for documentation, to enable transfer of best practice between people.

Best Practice Transformation

To revolutionize best practice it is necessary to focus on five areas and consider a 360-degree approach.



Orchestration

Documentation, establishment and development of automated tasks



Speed of Change

Regularly adaptive best practice



Complexity

Understanding causal complex components and their connections is critical



Culture

Best practice is only any good if regularly reviewed and people follow it when it is appropriate to use



Prediction

A predictive way to know what best practice to choose

The next step to explain what intelligent action to undertake is in “A guide to complexity of database systems”.

Methodology

The research consisted of a mixed method approach with a sequential explanatory design. A quantitative survey with participants from around the world that was followed by a set of qualitative focus groups.

References

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Victoria Holt

Database Researcher

T: @victoria_holt

LI: <https://www.linkedin.com/in/victoriaholt/>