

## **Team Discussion: Monolithic Systems vs. Microservices**

Understanding the difference between microservices and monolithic systems can be made easier by comparing it to a real business example. In this example, business decisions can be all signed by the highest order director or by one of the department directors. The second structure is probably what is embraced nowadays, because of its reusability and adaptability to change granted by easier management and communication inside smaller divisions/ departments. On the other hand, the first structure with one director might have the advantage of faster delivery of client requests due to the lower number of communications necessary to accomplish a task compared to multiple communications in the multi-division structure. However, scalability is an issue here; increasing the number of clients is tied to increasing the overall available resources compared to only increasing every unit's resources by a small capacity.

Getting now the bridge to operating systems and databases. Let's examine the following examples. The first one is handling Big Data. The best solution for that is probably a decentralized approach because it makes scaling up requests so easy. The second example is coding languages; modules and classes are used to break up things into more manageable components.

The main perspective of the analysis here is focused on functionality aspects. However, security is an essential part too. Let's assume that error tracking would be much easier in using microkernels, which is an argument for the general use of the microsystems (Biggs et al., 2018). Nevertheless, security does not only depend on error detection and tracking, but also on access control mechanisms and much more. In that respect, it seems there is still a lot of research that needs to be done to

guarantee the security of microservices applications. One clear example of this necessity is the Mobile Edge Computing Technologies (Roman et al., 2018).

The shift toward cloud computing and related technologies has been obvious due to the many advantages it can offer (Hashem et al., 2015; Hassani & Silva, 2015).

Along that shift, containerized microservices have been supportive due to the lightweight nature that offers virtualization at the operating system level to encapsulate resources needed for a group of processes (Marcelo et al., 2015).

Having said that, microservices may not be the solution to every problem. System architects need to carefully analyze business processes and how they are expected to go in the future. If the use of microservices is expected to simplify the design and bring the aforementioned advantages, then the choice is well argued and well-chosen (Bucchiarone et al., 2018; Biggs et al., 2018; Tapia et al., 2020; Newman & Fowler, 2020). Otherwise using a monolithic approach may be more suitable (Newman & Fowler, 2020).

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