SAPIENS

The Multigrained Services Evolution is Ideal for Insurers

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Introduction

Online purchasing must be seamless today, regardless of the purchase. Insurance consumers will compare the process of buying an insurance policy online with ordering a pair of Nikes, for example. They expect the same user experience, ease of use and personalization that today's leading online retailers provide. The fact that insurance products and claims are far more complex than a pair of sneakers doesn't deter consumers from demanding a modern user experience.

As part of their efforts to digitalize, insurers have started adopting **microservices** – small, dedicated and individually-deployable building blocks that enable providers to implement specialized services and features. These services don't require making major changes to the core systems, because they can work in harmony with them.

This new wave of architecture breaks down large monolithic systems into single, discrete functionalities and can form a suite of services that communicate with each other via simple APIs. It enables the addition and tweaking of individual components and capabilities, rather than updating an entire system.

This sounds like a godsend for insurers – a quick and economical way to create new functionalities and services, and to connect with partners who can sell the services. This concept is in-synch with the digital evolution and impatient consumers who want their insurance services quickly and easily.

But as we shall soon see, microservices also have some drawbacks and there are other types of services and a more ideal approach for insurers...





The Evolution to **Microservices**

Enterprise systems have been built using a **monolithic approach** for decades. These big systems typically focus on just one application with a familiar structure – client-side user interface, server-side operations, business logic, a database layer and integrations. One giant app controls all aspects of the user interface (UI), business logic and database.

While older monoliths offered synchronized schedules, releases, security, testing and more, introducing new functionality or services could be tricky due to the interconnectedness. When one component needed to be updated, the entire application was impacted; if one component wasn't functioning, it could harm the whole system.

In 2011, software architects coined the term "**microservices**" to describe the implementation approach used to build flexible, independently deployable software systems.¹ These smaller, independent apps would be responsible for highly defined, specific tasks, and would communicate using APIs. Each small app could use its own technology and language, and have its own data store, to do one thing well.

Monolithic systems no longer had to do everything. Microservices are small apps focused on carrying out a specific function in concert with the main software systems.

^{1. &}quot;Microservices in Practice, Part 1: Reality Check and Service Design," IEEE Software. Cesare Pautasso, Olaf Zimmermann, Mike Amundsen, James Lewis and Nicolai Josuttis, January 16, 2017.

Organizations seeking to add one-off features, such as adding more checkout microservices during Black Friday to deal with increased traffic, could do so quickly and easily.²

Amazon is a good example of a company that embraced microservices, because a slow software development process hampered the company's ability to push innovative solutions out to their consumers. They adopted a microservices approach and changed their development structure, famously creating "two-pizza" development teams – 'teams that were small enough to be fed with just two pizzas'.

Each microservices team defined and designed features; and implemented, tested, deployed and operated them; massively speeding deployments.³

3. "Benefits & Examples of Microservices Architecture Implementation," Apiumhub. Ekaterina Novoseltseva, April 18, 2018.





More Types of Services

For insurers, the advent of microservices meant being able to create new types of products specific to the smallest segments of the business, while also easily connecting with more partners and extending their reach into the insurtech market.⁴

But microservices architecture also had its downsides. When managing so many disparate small apps and their allied development teams, technologies, languages and processes, all those moving parts became difficult to handle. Problems arose when attempting to coordinate and control multiple microservices across teams, processes, geographies and technologies. Constantly monitoring and controlling many disconnected parts was a challenge. As a result, other approaches emerged.

Macroservices fall between the monoliths and the microservices. They take the already proven functionality of monolithic apps and reuse it in other apps, reducing risks, while enabling quick time to market. The downside to macroservices is that they often utilize hard-to-read code and make testing and scaling difficult.

The term miniservices is used to describe two or three apps sharing the same database. The danger of miniservices is the tendency to slowly add more services, APIs and features to the one database, resulting in the miniservice eventually resembling a monolith.⁵

4. "Microservice Platforms for Insurance: The Bluffers Guide," eBaoTech. Fiona Zhang and Pete Roberts, 2018.

5. "Multigrain Services: Micro vs. Mini vs. Macro," SD Times. Rod Cope, July 3, 2019.

^{2. &}quot;Multigrain Services: Micro vs. Mini vs. Macro," SD Times. Rod Cope, July 3, 2019.





Pros and Cons

With a range of options available, what works best for the complex and demanding insurance industry?

Microservices Advantages⁶

- Fault isolation: larger applications can remain mostly unaffected by the failure of a single module
- Elimination of lock-ins: organizations can try out new technologies on individual services as needed, without being locked into one vendor or technology for the whole system, increasing flexibility and ease of making changes
- **Speed:** smaller codebases and scopes, and independent development of individual features result in quicker, inexpensive deployments of days or weeks, instead of months or years for new products, partner distribution channels and services
- Easier to make changes: it's simpler to alter independent services without affecting other services
- Scalability and cost-cutting: small, individual services make it easy to scale up. Each component can be scaled up independently and inexpensively, preventing the need to rework the whole application for one service
- Extended market reach: easy connections with insurtech partners through APIs enables expansion into new markets⁷

Microservices Disadvantages⁸

- **Complexity:** microservices architectures have many more moving parts than monoliths, requiring enormous effort, careful planning and automation to ensure effective communication, monitoring, testing and deployment processes
- Hidden Costs: microservices are not uniform and therefore require more resources overall. Each service uses its own programming language and technology stack, and will therefore require development, management and maintenance for each module
- Security Threats: a significant increase in the volume of data exchanged between modules exposes more of the system to the network, and therefore potential attackers

^{6. &}quot;Microservice Platforms for Insurance: The Bluffers Guide," eBaoTech. Fiona Zhang and Pete Roberts, 2018.

^{7. &}quot;TIL-6: Which is Better? Microservice vs. Monolithic Architecture in a Nutshell," Noteworthy – The Journal Blog. Recep İnanç, December 2, 2019.

^{8. &}quot;Microservices Disadvantages & Advantages," Tiempo Development. Phil Wittmer, July 4, 2019.

Monolithic Architecture Advantages

- Easy Deployment: applications are deployed directly to the server, without a need for orchestration
- Simple Debugging and Testing: end-toend tests are easier to run on a single unit
- Wide Reach: it is simple to develop features that touch multiple services

Monolithic Architecture Disadvantages⁹

- **Ripple Effect:** one small change can impact many areas of the app, because the architecture isn't modular. It's often difficult to change one area without causing damage to others. If one part of the application goes down, the whole application is imperiled
- Difficult to scale: monoliths are not broken into smaller units, making scalability cumbersome and costly
- **Complexity:** with everything functioning in one place, it is harder to understand the status of the codebase
- Slow implementation: the interconnectivity and bulk of the system make implementation a long-term venture

9. "TIL-6: Which is Better? Microservice vs. Monolithic Architecture in a Nutshell," Noteworthy - The Journal Blog. Recep Inanç, December 2, 2019.



Insurers Need More than Microservices

Digital implementation and a demand for quick delivery of insurance products are challenging insurance providers. As they create more and better digital user experiences, they must be able to deliver them quickly and efficiently, while reducing costs and remaining flexible.

Microservices are the new kid on the block, but don't think that policy administration monolith systems are going away anytime soon. While microservices offer great flexibility for single services or functions, they are isolated and work in their own closed loop. Insurance processes run deep through many levels of each system and microservices are often unable to cover these needs. Also, their isolation could ultimately be detrimental to the insurer. **Monoliths** throughout the run deep transaction organization and each is processed as a complete solution. Since some monolithic apps are bound together, they can prevent insurers from being able to quickly and innovatively add services and experiences. Insurers must constantly find ways to sell more, while improving the customer experience and meeting demands. This dilemma compels insurers to quickly expand partnerships with insurtechs to benefit from new technologies, but not all monolithic systems allow for this strategy.





Finding Middle Ground

Every organization has its own needs and structure. While some will gain great benefit from microservices, others may gravitate towards macroservices or miniservices. Gartner predicts that by 2022, 70 percent of organizations will consider microservices too disruptive and will switch to other methods, such as miniservices.¹⁰

Systems like accounting and claims, which are at the core of insurers' operations, cannot be broken down into microservices.

The digital areas of the business are more conducive to microservices, which enable quick delivery of smaller products. By adopting microservices for services that need to be changed more frequently, insurers will up their game and add value for their customers. But there is another level to be reached...

10. "The Path to Microservices," Computerworld. Kevin Matheny, July 12, 2019.



The **Multigrained** Services Approach

Insurers need the advantages of all approaches – core systems that are available and agile, and full suites of independent services – with each service supporting the insurer's complex transactions. This is most visible in policy administration systems (PAS), where selling and servicing policies demands the best of monoliths and microservices.¹¹

Insurers who wish to remain flexible will opt for a **hybrid**, **multigrained approach that leverages a blend of services of different sizes and types, delivered and controlled via APIs.**¹² The terms and concepts "multigrained services" and "mesh app and service architecture" (MASA) that undergird this approach were created by Gartner.¹³

Multigrained services are comprised of monolithic services, miniservices and microservices:



Monolithic Service: one large application handling multiple functionalities, drawing upon one data base



Miniservice: separate set of domain-level services with its own database, handling multiple functions

Microservice: one dedicated service with its own separate database, handling an individual feature¹⁴

^{11. &}quot;InsurTech Blends Microservices and Modern Core Systems," PropertyCasualty360. Any Yohn, December 27, 2018.

^{12. &}quot;The 2019 MXDP Magic Quadrant: Application Development goes Multiexperience," Mendix. Gordon Van Huizen, July 16, 2019.

^{13. &}quot;Adopt a Multigrained Mesh App and Service Architecture to Enable Your Digital Business Technology Platform," Gartner Research. Anne Thomas, September 21, 2017.

^{14. &}quot;Multigrain Services: Micro vs. Mini vs. Macro," SD Times. Rod Cope, July 3, 2019.



Services Approach

MASA is the architectural model for the implementation of a multigrained approach that has emerged over the past few years. It aims to support organizations seeking the optimal combination of new approaches that support their digital environment.¹⁵ MASA provides the architecture for applications to support multiple experiences and respond quickly to digital business demands. It focuses on both individual applications and strategies for evolving the organization's entire application portfolio.¹⁶

This approach is comprised of several apps and services, and each app can service a specific user, consumer or agent. Using application architecture innovations, multigrained MASA includes concepts such as:

- Single-page apps
- Service-oriented architecture (SOA)
- Mediated APIs
- Microservices
- Cloud-native design
- Reactive programming
- Hybrid transaction/analytical processing (HTAP)
- Event-driven architecture (EDA)¹⁷

^{15. &}quot;What is MASA – Mesh App and Service Architecture?" API Friends. Stephane Castellani, June 5, 2017.

^{16. &}quot;Not Just Microservices: Choose the Right Service Granularity for Your Applications," Gartner Research. Anne Thomas, Aashish Gupta, Mark O'Neill, July 17, 2019.

^{17. &}quot;Not Just Microservices: Choose the Right Service Granularity for Your Applications," Gartner Research. Anne Thomas, Aashish Gupta, Mark O'Neill, July 17, 2019.



Business Benefits and Advantages

The multigrained approach provides architecture for insurers to support multiple experiences of varying sizes and scopes in an agile way. It equips developers with the flexibility to develop and deliver new services and features quickly, using the most relevant technology for each application.

The back-end consists of multiple independent modules (such as services) that developers can create, update and replace rapidly, and orchestrate to support distinct workflows. Each service represents one business capability, which is exposed to consumers through an API.¹⁸

Adopting the "best of all worlds" approach¹⁹ offers insurers significant benefits:²⁰

- Ease of connection with the digital ecosystem and insurtech partners via APIs
- A seamless omnichannel user experience and ease of transition from device to device
- Fast reaction time to business requirements
- Increased scalability for high traffic systems, as well as new services and features
- Smooth communication between legacy systems and new apps

A multigrained approach will empower insurers to maintain more complex services within a monolithic structure, while adopting micro, macro or mini services for the areas that require frequent innovation. This approach will also be a conduit to easily connecting with third-party insurtechs. The flexibility and agility will enable insurers to add value in a changing digital world.

18. "Adopt a Multigrained Mesh APP and Service Architecture to Enable Your Digital Business Technology Platform," Gartner Research. Anne Thomas, September 21, 2017.

19. "What is MASA – Mesh App and Service Architecture?" API Friends. Stephane Castellani, June 5, 2017.

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20. "How Mesh Application and Service Architecture Will Enable Continuous User Experience?," Ciklum. February 6, 2018.

About Sapiens

Sapiens empowers the financial sector, with a focus on insurance, to transform and become digital, innovative, and agile. Backed by 40 years of industry expertise, Sapiens offers a complete insurance platform, with pre-integrated, low-code solutions and a cloudfirst approach that accelerates customers' digital transformation. Serving over 600 customers in 30 countries, Sapiens offers insurers across property and casualty, workers compensation and life markets the most comprehensive set of solutions.

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