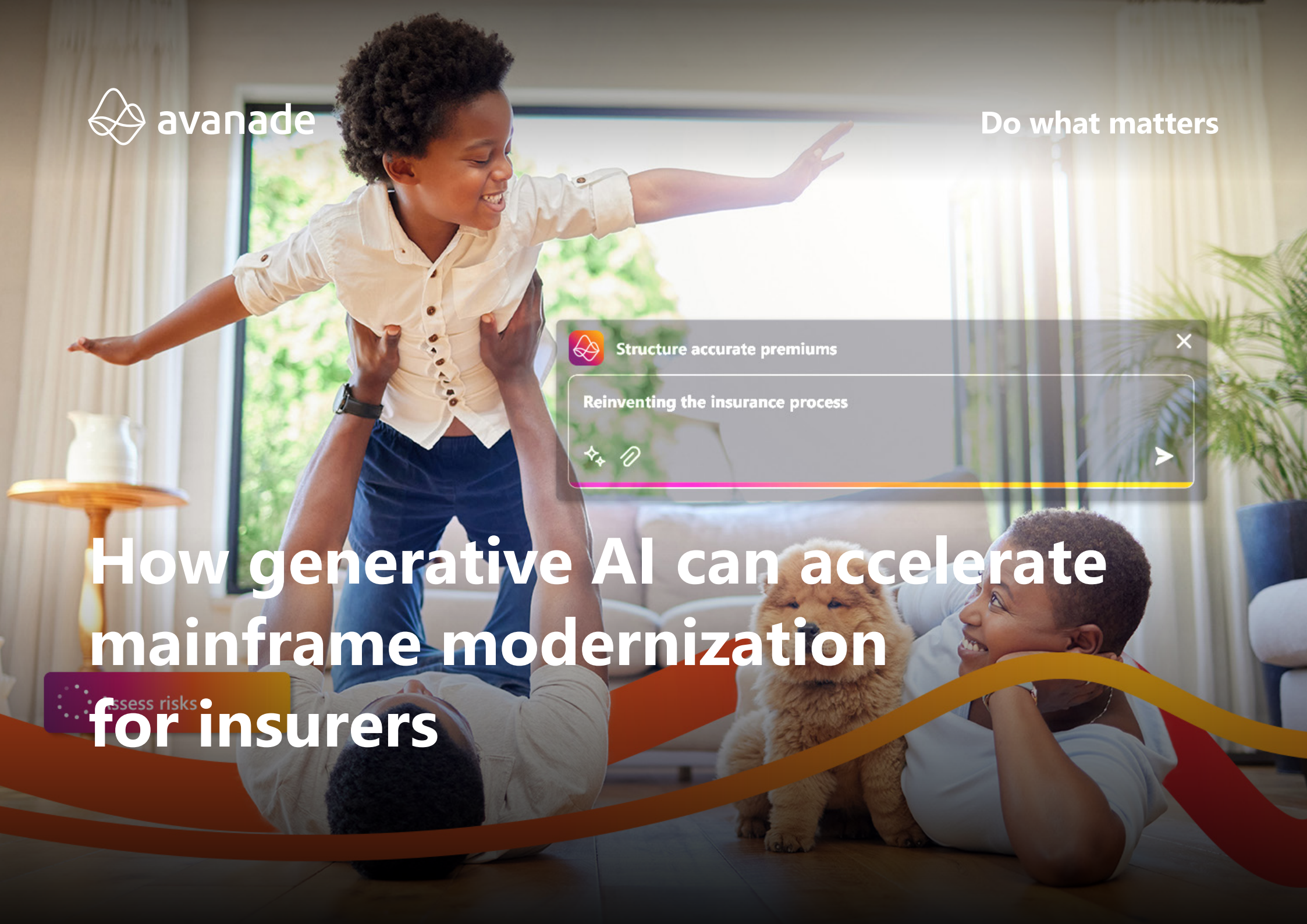

avanade
Do what matters
Structure accurate premiums
Reinventing the insurance process
How generative AI can accelerate mainframe modernization for insurers

Quick summary

- Mainframes have been incredible workhorses for insurers in the past. However, they are now costly and complex items to maintain – and becoming more so.
- To make the most of generative AI insurers need large amounts of data to be used in large language models. This data is typically found on the mainframe, but it is not in a state to be used by such models – it needs modernizing.
- Unleashing the power of this data could save $170 billion in creating better claims processes and $85-160 billion improving underwriting efficiency.
- However, generative AI can also help accelerate and de-risk mainframe modernization. For example, in mainframe conversions today around 70% of effort is focused on testing. Generative AI can drive greater testing automation, speed and accuracy.
- But there are areas where it is not suitable, such as comprehensive code analysis or holistic refactoring of a large code base.
- Whether you adopt a cost reduction or future-proofing approach, you have options that can be tailored to your situation. We know this because we have helped insurers and banks all over the world to modernize their mainframe estate safely and securely.

Mainframes are amazing, but ...

Mainframes are incredible. They consume 6% of worldwide spending but run 68% of production workloads. They provide 99.999% resilience and enjoy the highest level of security certification. They handle 90% of all credit card transactions and host more transactions each day than Google. 95% of ATM transactions rely on COBOL and over 70% of business process transactions run on it. All of the top 10 insurers are reliant on them.

However, ...

70% of transactions are processed by programmes that were written over half a century ago – in languages that few people are trained on these days. Often there is little or no documentation and the person responsible has retired (the average age of a COBOL developer is 55). This lack of key personnel is becoming critical and has led to more mainframe outages. 80% of IT budgets are spent on maintaining legacy systems, like mainframes. Making changes to such legacy systems takes time and limits a bank's agility in the market. More than 30 years have passed since mainframes were at their peak, so many insurer's core systems are far from being future-proofed. And costs are increasing: MIPS growth continues to outpace revenue growth across major insurers.

But insurers know this. They've simply made the judgement that the hassle of keeping on the mainframe is (just about) worth the cost and complexity of trying to move off it into the cloud. Or they are trying to do this in small steps rather than a huge, high-risk transition project. Remember: we are dealing with systems that typically look after mission-critical applications. They are complex and difficult to change. And if things go wrong, you don't want to be the executive responsible.

The time is now

The real risk is to do nothing. Legacy systems constrain innovation and stop insurers from moving quickly in response to market disruption. Plus all the knowledge associated with these systems vanishes overnight once the developer retires (if you cannot replace them). But there is another reason why insurers cannot delay modernization any longer. Mainframes contain massive amounts of data, which are vital to any generative AI work, including developing large language models. Insurers have access to massive volumes of data which they collect from various devices (vehicle telematics, Internet of Things) as well as from customer interactions, third-party databases and more. Also, the economics of AI have substantially improved and the technology has matured significantly. Unleashing all this data to drive generative AI activity has to be a major focus for insurers going forward if they wish to stay competitive.

According to Accenture research, for example, there are major opportunities to use generative AI in claims and underwriting. They estimate that over the next five years $170 billion in premium is at risk as customers switch carriers due to not being fully satisfied by the claims process. Underwriters are spending 40% of their time on non-core activities, which will represent an efficiency loss of $85-$160 billion over the same period.

Case study

A North American insurer was faced with an aging workforce with experienced mainframe application developers and systems programmers nearing retirement. It was challenging to recruit graduates with mainframe knowledge. Rewriting or replacing the policy administration system was not a viable option. The leadership team quickly realized this would mean hiring additional developers, which would be expensive and time consuming.

Our solution was much faster and less expensive, and the migration project was completed within the required time frame. Moving off its mainframe has allowed the client to achieve its strategic information system goals. Having one common computing platform simplifies its environment and allows its IT team to focus more on the business rather than having to focus on the issues associated with supporting more than one system.

Generative AI can accelerate and de-risk mainframe modernization

Generative AI has brought new perspective and opportunity to accelerate and de-risk the journey to mainframe modernization. An 'AI-first' approach to mainframe modernization can help insurers to accelerate mainframe modernization in three ways:

Code documentation: AI provides the ability to produce documentation and/or architecture information from existing mainframe code, including functional flows through linked programs.

Code modernization: AI can analyze the apps portfolio at volume, identify business functions that can be digitally decoupled and move those undifferentiated items (ledger, accounts transfer, payments etc) to industry standards (COTS, SaaS, low/no-code etc). AI can show which code needs modernizing (customer service, advanced products etc), as not all code does.

Test acceleration: in mainframe conversions today around 70% of effort is focused on testing. Generative AI can drive greater testing automation, speed and accuracy.

Our generative AI mainframe approach consumes legacy code and application insights to produce complete, accurate, readable documentation that informs modernization strategy and automates much of the testing life cycle. A typical process involving generative AI will include:

- Decomposing source files into code headers/blocks (decomposition will vary by platform)
- Individually generate summaries for all modules
- Combine summaries into a knowledge graph
- Identify and summarize application and data flows
- Create test cases for application and data flows
- Create test data for test cases

By leveraging clear technical and functional outputs from generative AI documentation, the largest uplift is realized throughout the testing life cycle, where 70% of the migration effort exists today.

Generative AI is useful for analyzing, summarizing, explaining individual programs and small portions of code. It quickly extracts information/business logic (if the developer knows what sections of the code has business logic). It can technically categorize individual programs and small segments of code and generate implementation with the right prompting and validation. Proper prompting is essential, making this a valuable tool for experienced developers. It can also efficiently generate test cases, test scripts and test data.

But there are areas where it is not suitable. For example, comprehensive code analysis (to understand all the interdependencies) or holistic refactoring of a large code base in one go with multiple programs, dependencies, databases and file structures. Autonomous A-to-Z migration processes, such as the conversion of legacy programming language to a modern language, is not straight forward due to differing programme paradigms.

It will not generate reliable outputs without significant validation from a seasoned developer. OpenAI solutions often necessitate a thorough review.

Case study

Athora is a European insurer with offices in Netherlands, Italy, Belgium and Germany plus reinsurance subsidiaries in Bermuda and Ireland. The company developed its core insurance systems using the Unisys programming language running on Unisys Libra 690 mainframes. Over time, the company found that this environment burdened it with high costs and limited flexibility.

In its search for an alternate solution Athora chose Avanade's Automated Migration Technology. 15 different applications, of which eight are business critical, were migrated, including customer information, individual life policies, P&C policies, account receivables and credit management.

Results included 70% reduction of infrastructure and operational costs. 5.3 million lines of code were migrated on time and on budget.

"Avanade proved to be the supplier of the necessary tools and knowledge for this kind of migration," says Marcel van de Lustgraaf, managing ICT director at Athora. "Besides that, they also take full responsibility and ownership in the project and act as a true partner for Athora."

Sweet spots for generative AI

Using Open AI tools for AI-assisted modernization will accelerate specific tasks, but not without human intervention and review. Code summarization, explanation, documentation and semantic analysis are good places to start. During migration, code optimization, search and review, infrastructure provisioning and test case generation should be areas of focus. As part of the modernization process, generative AI can help with UI and API generation and code review. During the operational phase, generative AI can help with developing conversational agents, historical document analysis and content QA and search.

The impact of generative AI is particularly high during the design and build and test and deploy phases. For the former, it can generate boiler plate code for target API implementation and set up landing zones. For the latter, it can create unit test cases and scripts, test run prioritization and automate deployment.

You have options

There are many ways to mainframe modernization. But they can be summed up in two approaches:

Cost reduction: which is typically suited for a small apps portfolio. This is usually a single release and provides the opportunity to retain business logic investment. This will accelerate savings and create faster time to market.

Modernization: to future proof your apps portfolio, which is typically suited to large mainframe application portfolios. This is an incremental approach and more application-centric, where you would selectively rearchitect to move to a cloud-native environment. This is much more centered on business outcomes.

Application portfolio assessment usually provides the basis to determine the best modernization approach, based on strategic alignment (Does the application provide a competitive advantage?), functional adequacy (How flexible is the application to adapt to product innovation?) and technical suitability (Does the application meet expectations on maintainability, operability and performance?).

There are a number of options that can then be tailored to your specific situation. You can mix and match these elements. We do not have a 'one size fits all' approach:

Retain

manage, optimize, and modernize the existing mainframe application

Rehost

leverage Mainframe as a Service and co-location partners to rehost the existing mainframe application

Refactor

use digital decoupling techniques, change the application architecture, and rewrite code using modern programming languages

Retire

maintain and manage mainframe functionalities until the end of their useful life

Replace

replace the mainframe application with a custom off-the-shelf or SaaS solution which supports the business capabilities/ functionalities

Replatform

recompile the application using Avanade or another ecosystem and their tools and Replatform application outside of the mainframe. Leverage managed cloud services where possible

Reimagine

create a whole new cloud-native solution which provides new business capabilities or supports new business models

We have a range of tools, such as a set of converters that will 100% automatically convert source code, databases, jobs and workflows. Our conversion metric - 80 defects per million lines of code - makes it one of the industry-leading tools in COBOL code refactoring.

We can assess application portfolios in terms of complexity, develop target application architecture plans, design enterprise-scale cloud landing zones and manage operations effectively in the new platform.

Apart from industrialized methodologies and assets, we have over 10,000 specialists focused on legacy and host-centric platforms. We recently acquired Asysco, an expert in migrating legacy mainframe applications to the cloud. Along with Accenture – with whom we partner – we are the leading implementation partner for Microsoft Azure and cloud services.

Customer stories

Here are some examples of our work with insurers and banks:

Dutch insurer Core systems on Unisys mainframes. 15 applications (8 business critical) migrated (Life, P&C etc). 5.3 million lines of code (LOC). On time and within budget. 70% Opex reduction. New environment is as stable as before. Future-proof system based on standard Microsoft technologies.

Japanese securities house Full rehosting of bond trading system (batch, online and data) with Oracle database. Rehosted 7,500 MIPS and saved over 60% on TCO.

Italian insurer Full re-hosting. Re-platformed with Microfocus COBOL. 7mn LOC, 1mn Life Insurance policies consuming around 1000 MIPS. TCO reduced by 80%. Reduced CPU consumptions and greatly improved elapsed time.

Polish bank, Replatform – mainframe simulation. Migrated part of its legacy applications to .NET. Getting off the mainframe led to 70% TCO reduction. Upgrade to a more modern development environment.

Spanish bank, Reengineering of a batch mainframe application that processes and generates accounting reports for the bank's 80mn customers. 160 Cobol programmes rewritten. Significant MIPS reduction. Reduced batch processing from 8 to 3 hours.

US Insurer, Migration of policy administration application from IBM mainframe (3.2mn LOC, 250 GB database) to Avanade automated migration technology (AMT) solution with Microsoft SQL.

Australian bank, Built copy banking architecture on Hadoop and Java microservices and Master Data Management information. Bank built extra services (mobile payment push notification, fraud detection and customer segmentation). 50% reduction of online digital transactions load to mainframe.

Swiss private bank, Migrated core banking applications from Unisys mainframe (1.3mn LOC, 1,000 programmes, 750 online screens) to Avanade AMT development platform.

Canadian Insurer, 40+ mainframe apps migrated to Azure as cloud-native applications.

Polish bank, 6mn LOC (9k MIPS) converted to .NET resulting in 80% Opex reduction.

German Auto Finance, End-to-end apps portfolio assessment (15k MIPS, 500 apps, 120mn LOC in 10+ countries).

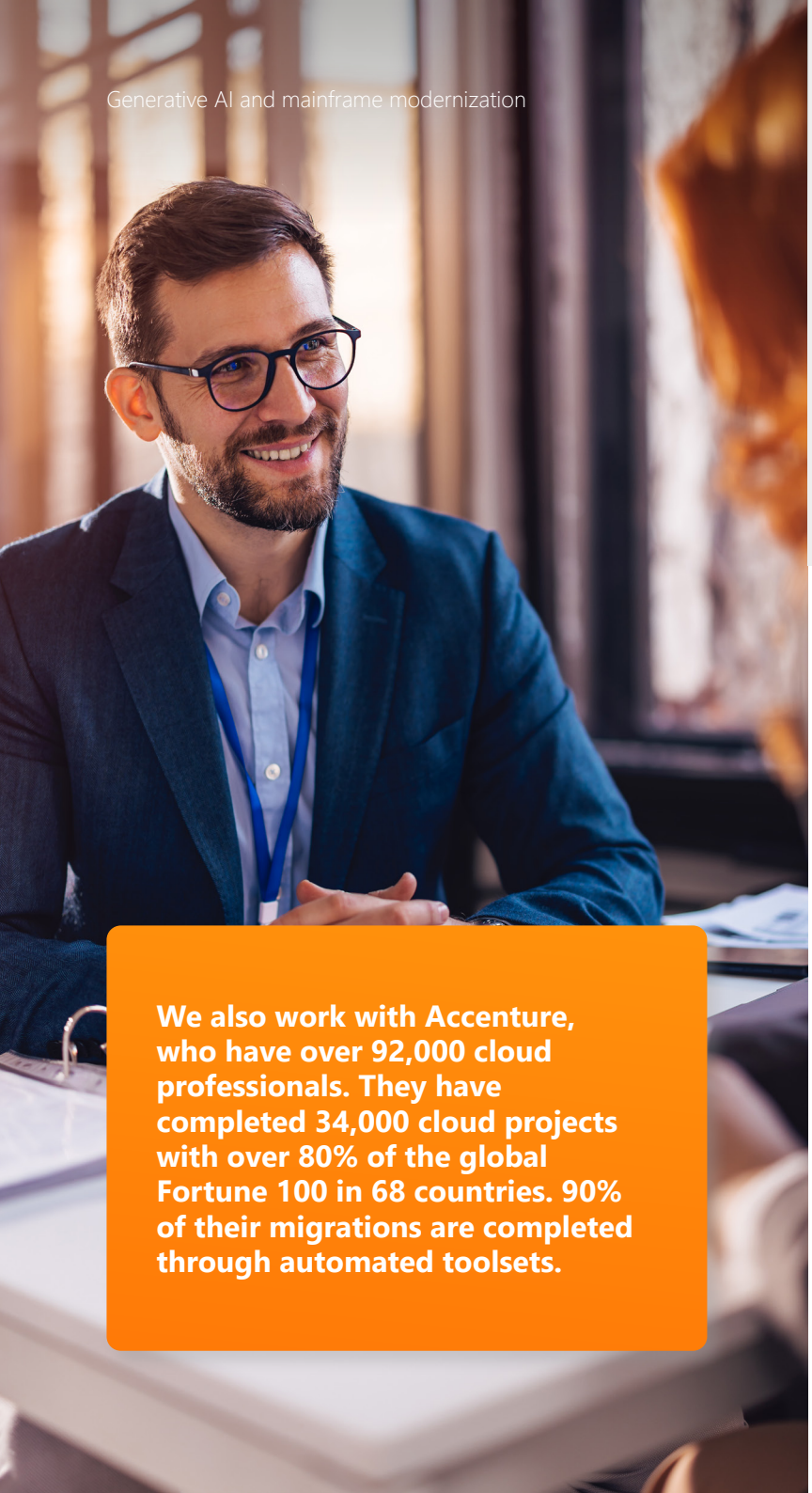
Getting started

We have three simple steps to assess your environment and develop a plan:

1. To begin, we would collect your mainframe estate data (MIPS, lines of code, apps and contracts) and plan for an initial call with our specialists.
2. We have a customer site survey to assess and identify needs and opportunities, usually lasting 6-8 weeks (the first week is onsite, followed by 4-6 weeks analysis).
3. The subsequent site survey report details migration project specifics, including project requirements, timeline and costs.

If you would like to discuss this further, please

Get in touch



We also work with Accenture, who have over 92,000 cloud professionals. They have completed 34,000 cloud projects with over 80% of the global Fortune 100 in 68 countries. 90% of their migrations are completed through automated toolsets.

Why Avanade?

Our modernization expertise

Avanade has over 10,000 people working on legacy and host-centric platforms. We are currently working on 100+ modernization projects. Our discovery service supports 27 languages and we have analyzed, remediated and modernized over 150 million lines of code. Through our recent acquisition of Asysco, we have access to automated migration technology, including a set of converters that will 100% automatically convert source code, data, databases and data files, jobs and workflows.

Our other tools include:

Application classification: to select the optimal path for the application (replatform, refactor, reimagine or replace)

Reference architecture patterns: this includes blueprints, patterns and guidance for target application architecture

Application analysis framework: this includes application complexity analysis, clustering framework and roadmap development

Landing zone templates: we design enterprise-scale cloud foundations (Azure) aligned with various security and availability requirements

Control center: we manage operations effectively in the new platform. i.e., scheduling, security, configuration, processes, and output management

Development studio: this includes functional code development and modernization tools enabling COBOL and Java/.Net application development

Our insurance expertise

We work with 8 of the top 10 insurers globally and 45% of the top 100 are Avanade clients. We work with property and casualty, life and annuity and health insurers.

Advisory

We partner with our clients to drive innovation and digital transformation, including core systems, such as policy administration.

Generative AI

We're helping insurers digitize claims and underwriting processes to improve customer journeys. We apply intelligent automation and AI to deliver efficiency and deep customer insight. We can help with data management, chatbot development and large language modeling.

Digital marketing, sales and service

We've created 360-degree customer views, improved cross-selling rates and identified next best actions. We've improved lead qualification, opportunity tracking, campaign planning, personalization and onboarding.

Security

We've developed expertise across digital identity and authentication, data protection, encryption, secure collaboration, incident response and cyberdefense.

Workplace transformation

We adopt a holistic approach, involving IT, HR and business division heads. If you need it, we've pulled together best practices on remote working.

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Do what matters

Contact Us

Avanade is a recognized leader in delivering Microsoft solutions to financial services institutions. For more than 20 years, we have worked with banks and insurers worldwide developing and implementing solutions.

Contact us today

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Avanade is the leading provider of innovative digital, cloud and advisory services, industry solutions and design-led experiences across the Microsoft ecosystem. Every day, our 60,000 professionals in 26 countries make a genuine human impact for our clients, their employees and their customers. Avanade was founded in 2000 by Accenture LLP and Microsoft Corporation. Learn more at www.avanade.com