Exploring the Future of Actuarial Modernisation

Global Insights with a Luxembourg Focus

3 April 2025

pwc

ILAC
INSTITUT LUXEMBOURGEOIS DES ACTUAIRES

Agenda

1. Actuarial modernisation: why we are talking about it
2. Deep dive into results:
    - Strategy
    - People
    - Processes
    - Technology
3. What's next

Actuarial modernisation: why we are talking about it

Why doing and talking about the PwC Global Actuarial Modernisation Survey

Actuarial Modernisation is part of **Finance Transformation.**

The insurance industry has undergone significant changes, including accounting changes but the modernisation journey continues for many.

As technology and tools continue to advance, such as GenAI, finding use cases in the insurance industry can prove to be a **differentiator** in efficiency and bring first mover advantage.

Actuaries are finding themselves in traditional actuarial roles but also playing a role in driving business requirements and **transformational decisions** as actuarial data and platforms become more integrated with other parts of the insurance value chain.

At PwC, we support Actuarial Modernisation journeys across the market and across the globe with our deep industry-wide expertise and our strong global network.

Luxembourg tends to be a follower after solutions have been adopted on the global market.

However, we see that certain innovations are onboarded quite quickly in Luxembourg.

Understanding the trends is also essential in developing the transformation.

We see among insurers in Luxembourg (also consistent with the results of this survey) that it is sometimes difficult to get buy-in and support for embarking on Actuarial Modernisation.

We hope these materials and the upcoming report will be helpful in your discussions with executives and decision-makers in your company.

What is Actuarial Modernisation

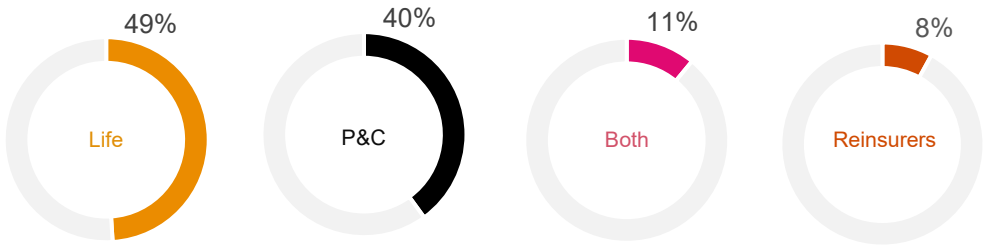
Modernising these key components creates a more **efficient**, **strategic**, and **resilient** actuarial function. This holistic transformation positions the actuarial team as a **vital contributor** to the company's success, driving **operational excellence**, **cost savings**, and **strategic insight** through an **enhanced target operating model**.

Data	Actuarial Models and Systems	Process	Governance
• Unified Data Sources • Modern Data Management • Business Requirements and modern TOM	• Advanced actuarial models with robust data processing • Model validation and back-testing • Advanced Analytics supporting decision-making • Management Information Systems	• Technology enabled processes, automated routine tasks • Advanced software, sreamlined processes; • Centers of excellence, delegation	• Adherence to professional standards • Efficiency Through Governance • Automation Oversight
People and Talent	**Policies and Procedures**	**Technology**	**Service Delivery**
• Team-Based, Matrix-oriented structures • Actuaries in strategic Roles • Talent Mobility in organisation (departments and business units)	• Clear Policies • Production environments driven by robust actuarial numbers • Standard Guidelines: consistency, compliance and efficiency.	• IT Partnership – relevant, tailored, focused on business needs • Broader Technology Use: improve efficiency and performance	• Mobile Teams • Shared Services • Flexible Staffing • Outsourcing

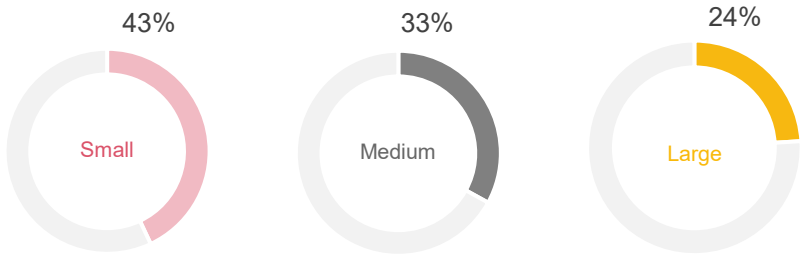
Methodology of the Survey

200+ survey participants worldwide

Industry



Size



Americas

39%

EMEA

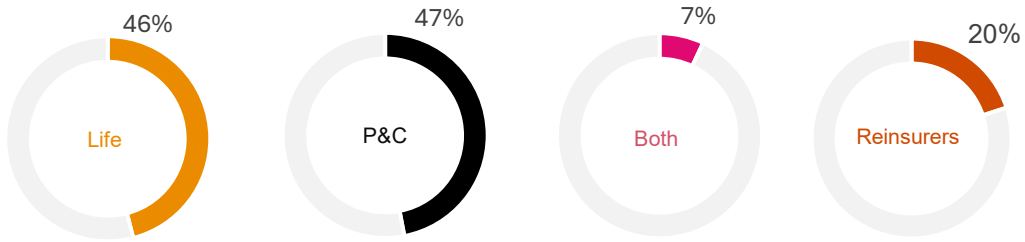
39%

APAC

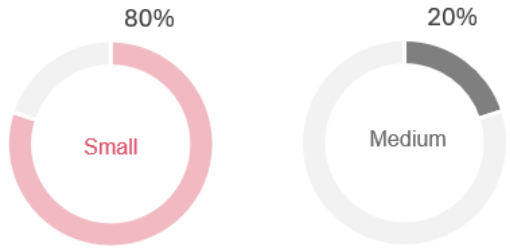
22%

15+ survey participants in Luxembourg

Industry



Size



We would like to express our sincere gratitude to all of the participants who took the time to contribute to our survey

Key observations

Efficiency is the clear top goal for changes

Nearly all participants identify process efficiency as a major driver for their modernisation initiatives. Clearly overtaking regulatory / accounting changes which was the top drivers for modernisation in previous years.

Over 64% also recognise management insight and process quality as key factors prompting their need to modernise.

Unsurprisingly, other top catalysts include quality of process, regulatory or accounting changes, enhancements in the control environment, cost reduction, and key person risk.

Data management takes too much time

Actuaries are currently spending **more than three days a week** on data preparation instead of analysis, which is far from ideal.

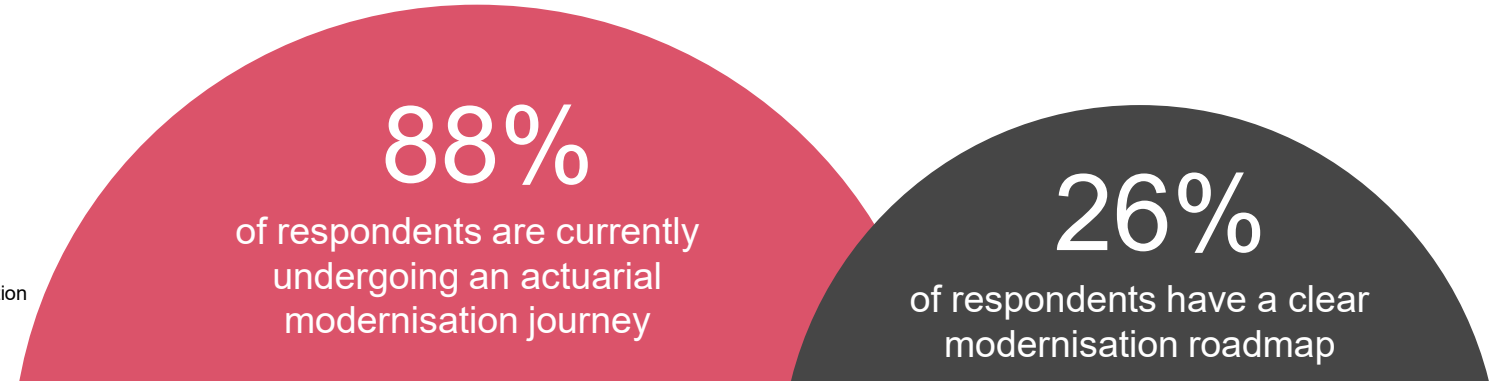
More than 55% of respondents report lacking a single source of truth for their data, and over 60% lack sufficiently automated workflows.

While most firms now have access to a variety of data sources and can obtain timely and accurate data under robust governance controls, they face new challenges.

Automation in actuarial functions as a key driver of operational efficiency

Automation is rapidly advancing in the insurance industry, improving the efficiency of actuarial practices. By automating more traditional tasks, actuaries **can allocate more time** to in-depth analysis, especially as advanced data science techniques and GenAI become more prominent.

Many companies have already achieved considerable automation in areas such as modeling and controls.



Key observations

Realised benefits of outsourcing

Many firms, **over 60% in fact**, have recognised the substantial benefits that outsourcing can offer, including increased capacity for work, enhanced quality of outputs, and significant cost savings.

However, realising these advantages is not without its challenges. Potential hurdles, such as locally created shadow processes due to quality concerns and disruption in team culture, can impede the full realisation of outsourcing benefits.

New skills required for the Actuaries of the Future

Approximately 70% of respondents indicate that actuaries are involved in areas such as Data Science & Analytics, Cloud & Data Strategy, GenAI, and Finance Systems Modernisation.

Around 65% of participants want their actuaries to develop soft skills, such as communication and leadership, alongside technical skills like business intelligence and coding languages.

Additionally, **over 60%** of respondents consider project management, advanced data analytics, predictive analytics, and data science as essential competencies for actuaries-.

Move towards the predictive analytics and GenAI

Over 30% of companies plan to adopt machine learning technologies in the next few years and **another 30%** currently use machine learning.

GenAI adoption remains at an early stage for many insurers, with most currently focused on gathering use cases and establishing governance.

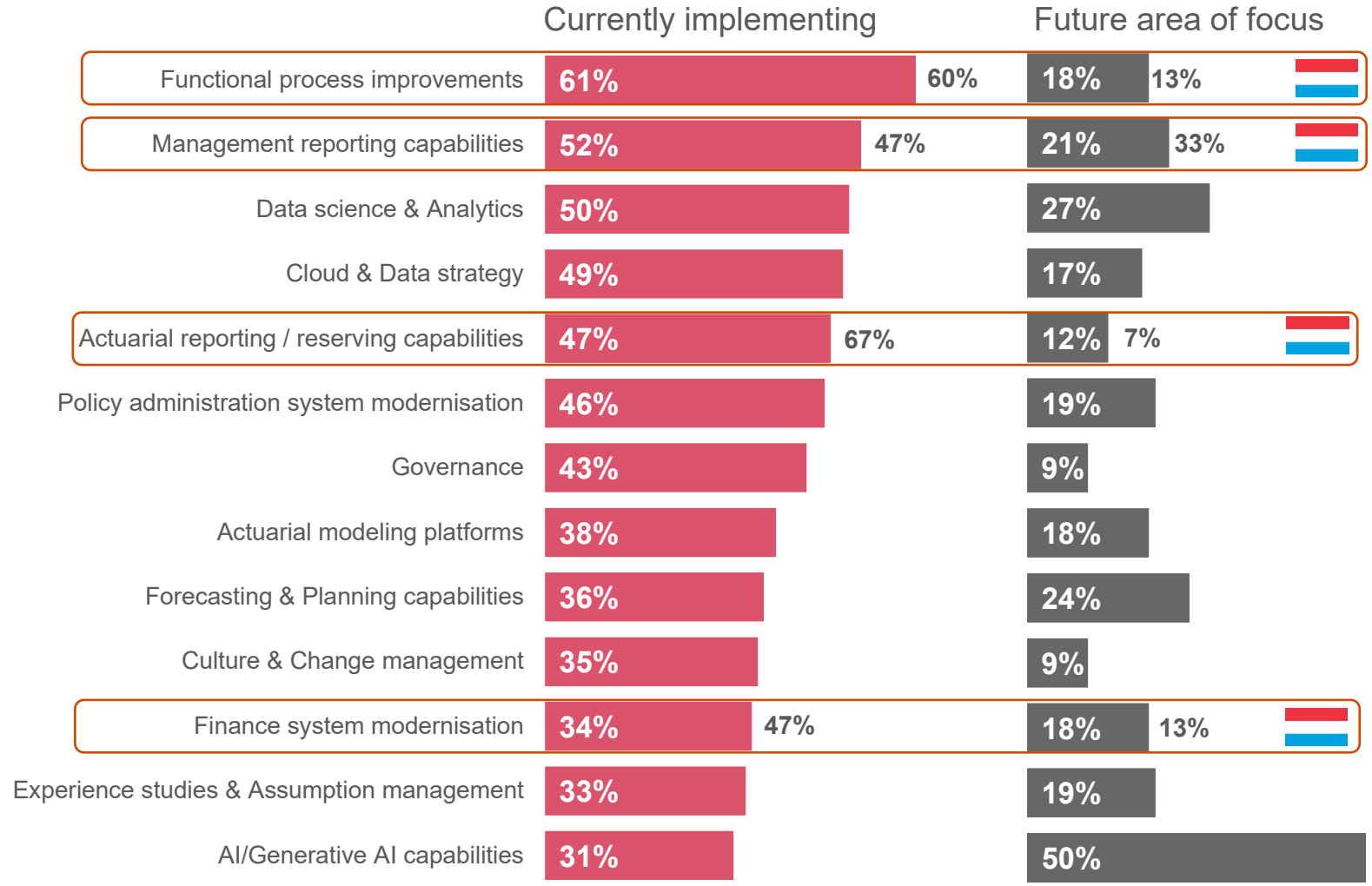
Early experiments have shown benefits in modeling and productivity, yet many have yet to implement GenAI assets.

Detailed answers by key dimensions Global and Luxembourg view

Part 1: Strategy

1. Actuarial Modernisation Strategy

1.0 Modernisation initiatives and drivers



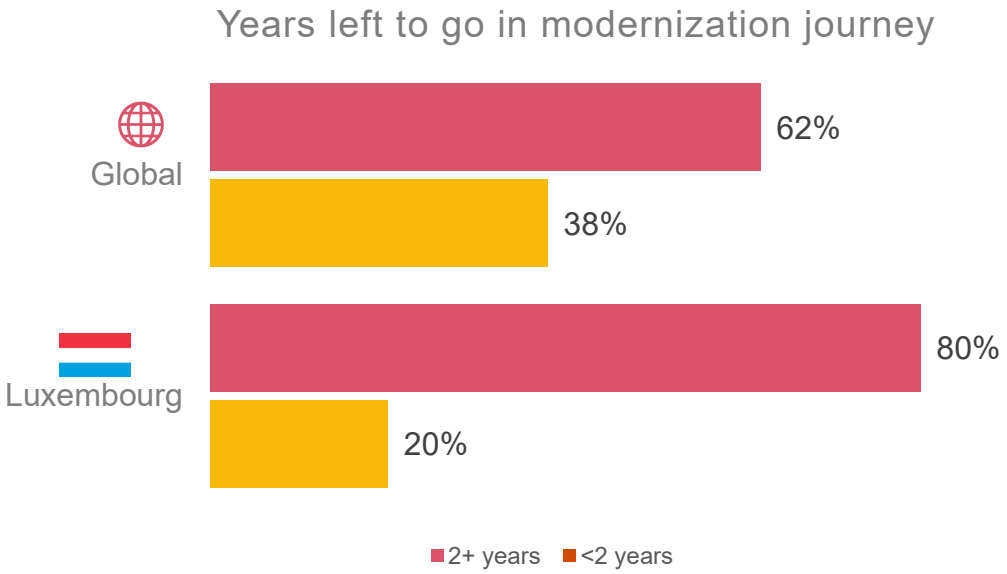
- Key drivers of modernisation are: **Efficiency and quality of processes, Improvement of management insights, Regulatory changes and Cost reduction.**
- Current focus of modernisation programs globally are in: **Process improvements, management and actuarial reporting, Data analytics, Data strategy.**
- Future global focus will be shifted to **Gen AI capabilities, Forecasting and planning.** While the areas of Data analytics and reporting improvement will maintain the priorities.
- In Luxembourg we share the same view as global, however the **Finance system modernisation** is also mentioned as one of the top areas.

94%

of participants say efficiency of processes is a main driver for modernisation

1. Actuarial Modernisation Strategy

1.1 Timeline and costs for Actuarial Modernisation Strategy



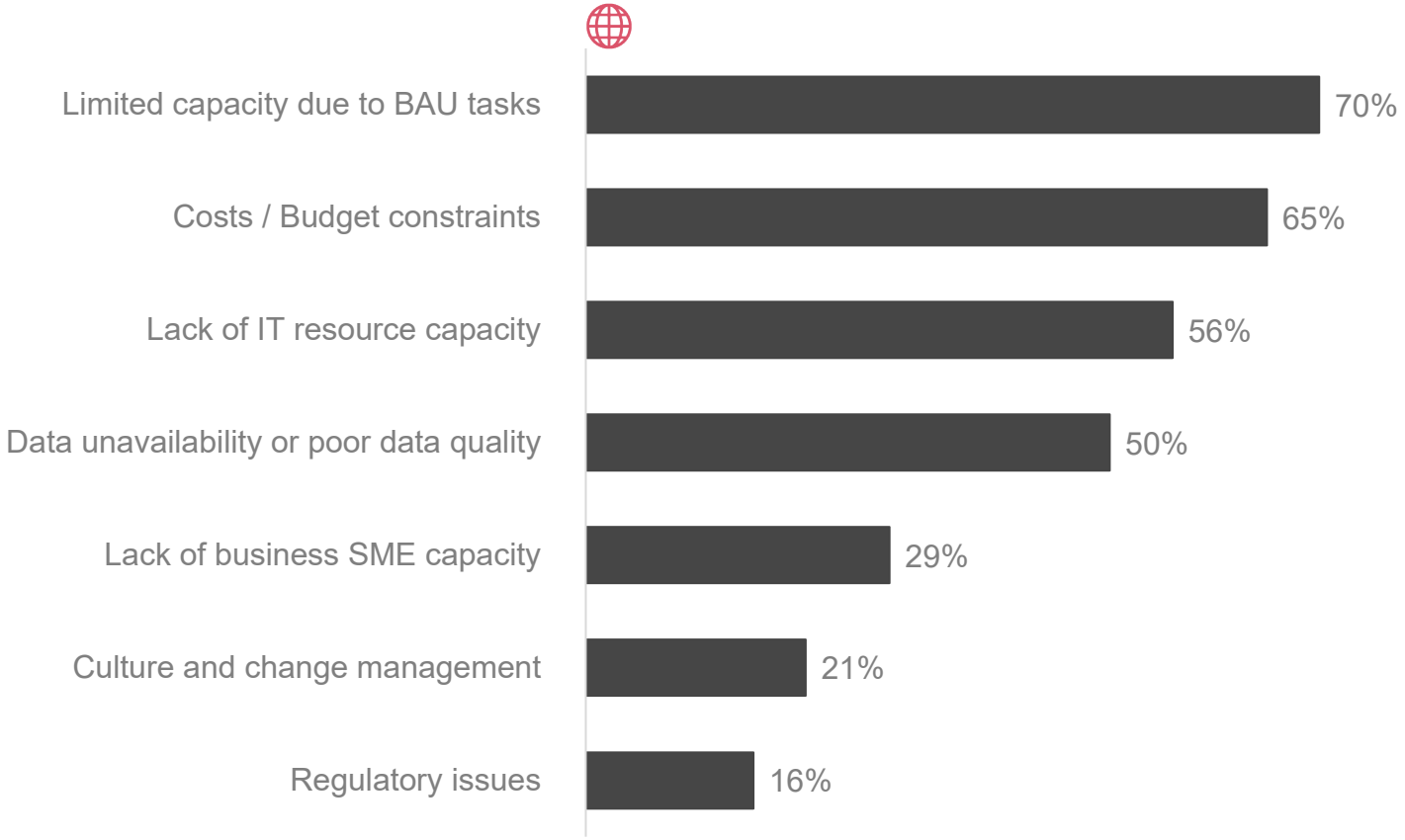
- Globally, nearly **50% of companies** anticipate that their modernisation efforts will extend beyond **the next two years**.
- In Luxembourg, **only 20% of companies** expect to complete their modernisation within this timeframe.
- Regarding estimated modernisation costs over the next five years, 50% of companies globally and two-thirds of companies in Luxembourg plan to invest **$1 million USD** or less.

8m USD

is the average estimated modernisation programs costs reported

1. Actuarial Modernisation Strategy

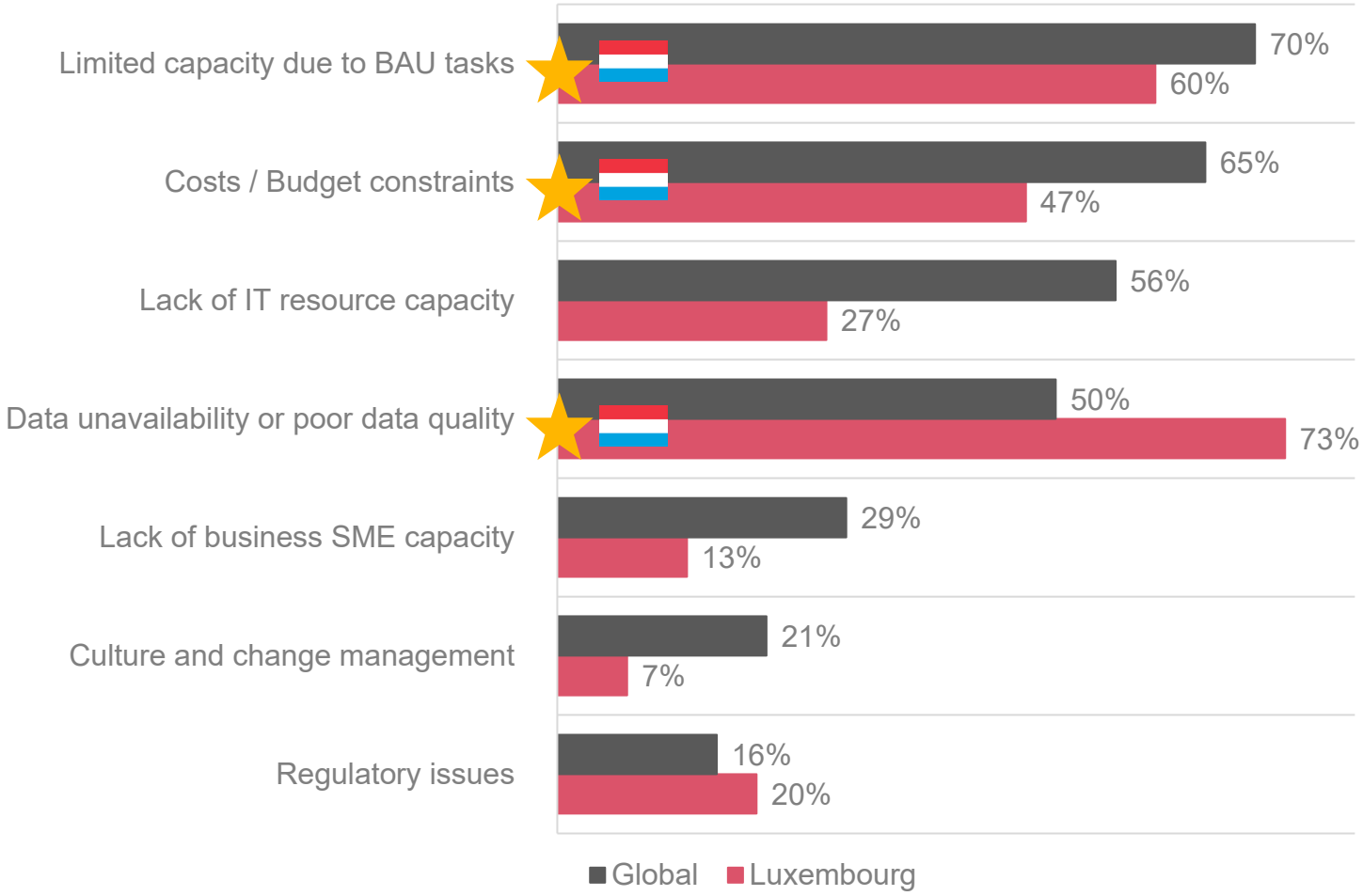
1.2 Risks or constraints faced when executing modernisation strategy



- At a global level, 3 of the top 5 constraints to modernisation indicated by survey participants is related to **lack of capacity**. While demand for actuarial expertise has grown, the time available for actuaries to focus on internal process improvements has shrunk.

1. Actuarial Modernisation Strategy

1.2 Risks or constraints faced when executing modernisation strategy



- At a global level, 3 of the top 5 constraints to modernisation indicated by survey participants is related to **lack of capacity**. While demand for actuarial expertise has grown, the time available for actuaries to focus on internal process improvements has shrunk.
- In Luxembourg companies **data issues** as being the blocking point followed by lack of actuarial and IT resources.

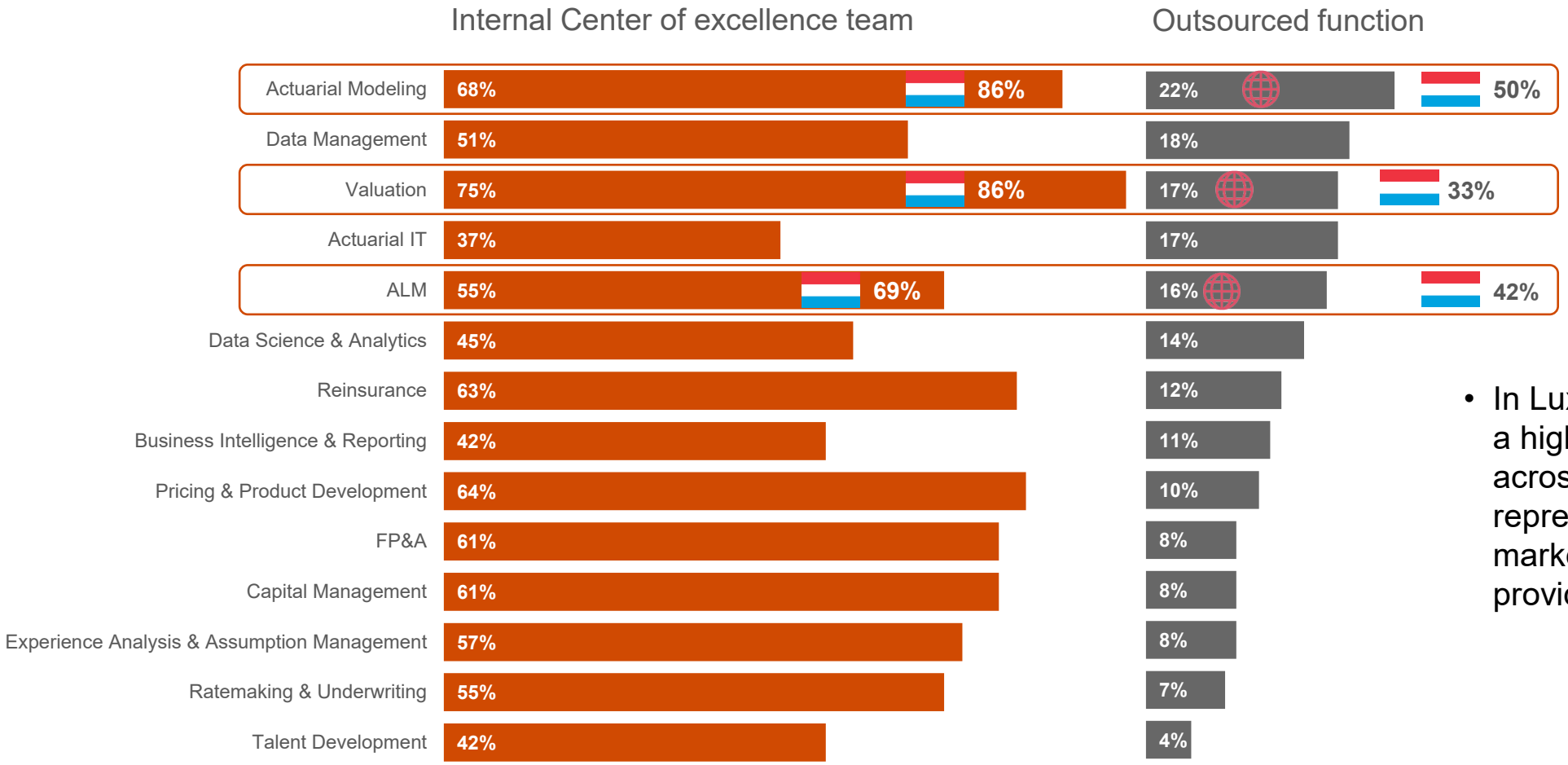
1. Actuarial Modernisation Strategy

1.3 Center of excellence teams

- At a Global level, **valuation, actuarial modeling, and pricing & product development** are the leading Centers of Excellence, with **modeling** being the most outsourced function.

1. Actuarial Modernisation Strategy

1.3 Center of excellence teams



- In Luxembourg, respondents showed a higher incidence of outsourcing across all functions. This is highly representative of the Luxembourg market compared to the global data provided.

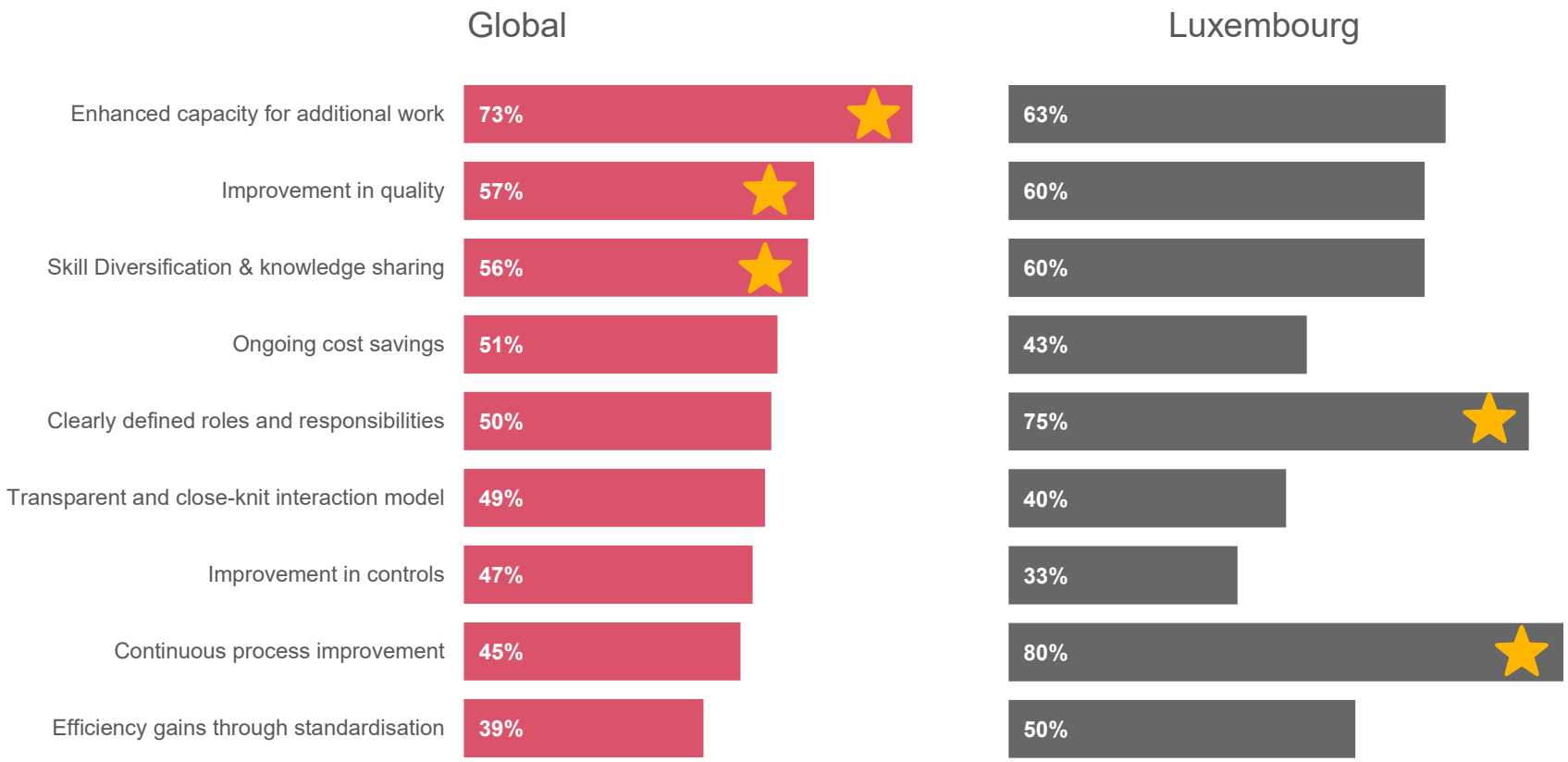
1. Actuarial Modernisation Strategy

1.4 Outsourcing Benefit Realised

The survey shows that outsourcing has, so far, **delivered the expected benefits**, though the success rate varies a lot depending on the type of benefit.

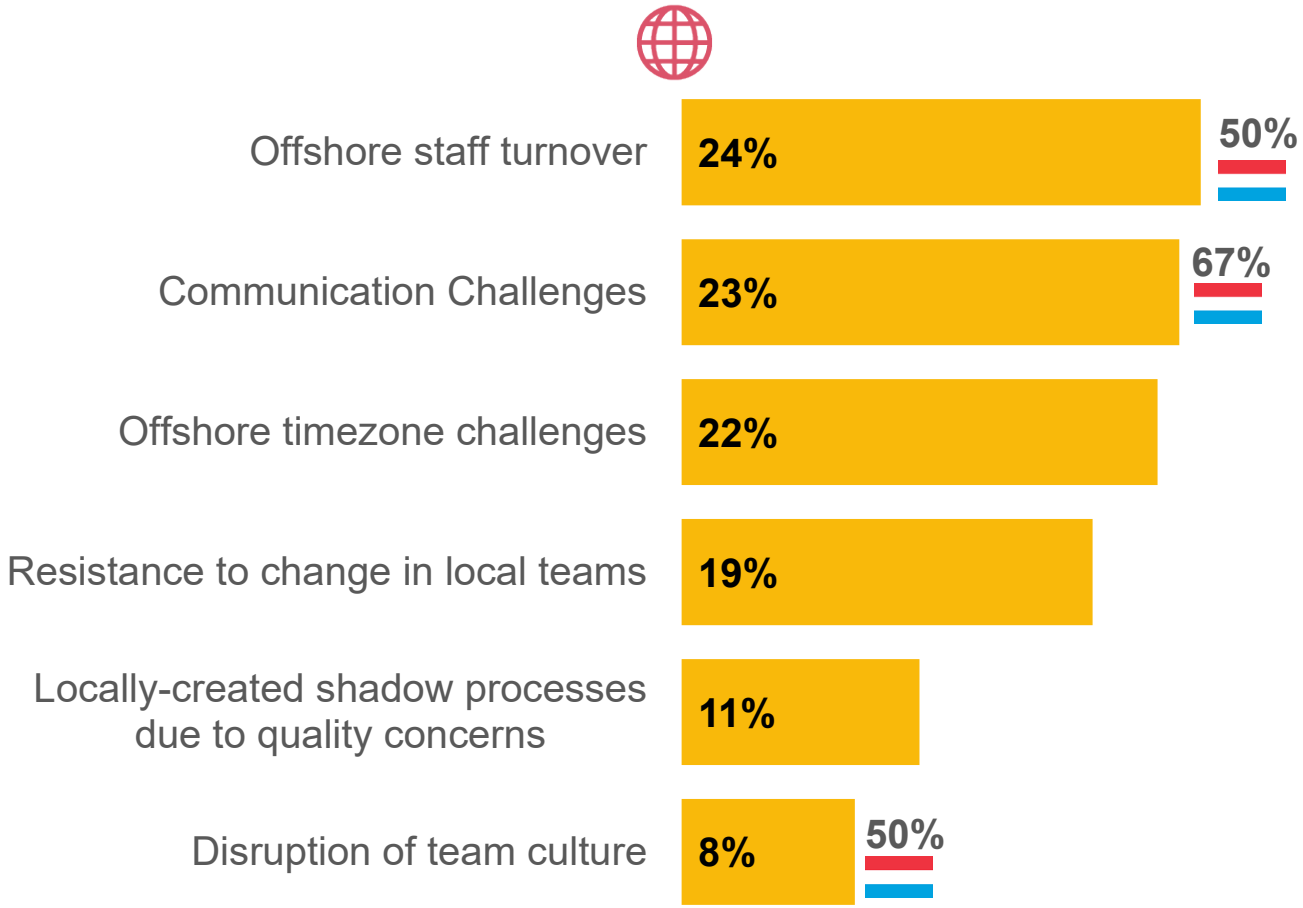
The best response at a global level, was related to **an increase in capacity for additional work**.

Luxembourg respondents instead indicated **Continuous process improvement as** the most significant benefit achieved, with an implementation rate of 80%.



1. Actuarial Modernisation Strategy

1.5 Outsourcing faced challenges



The survey also investigated the challenges respondents encountered with outsourcing functions. The results showed rather positive outcomes at the global level, where the negative impact of outsourcing was relatively contained, with the main issue being **offshore staff turnover** at a rate of 24%, followed by other issues in decreasing order.

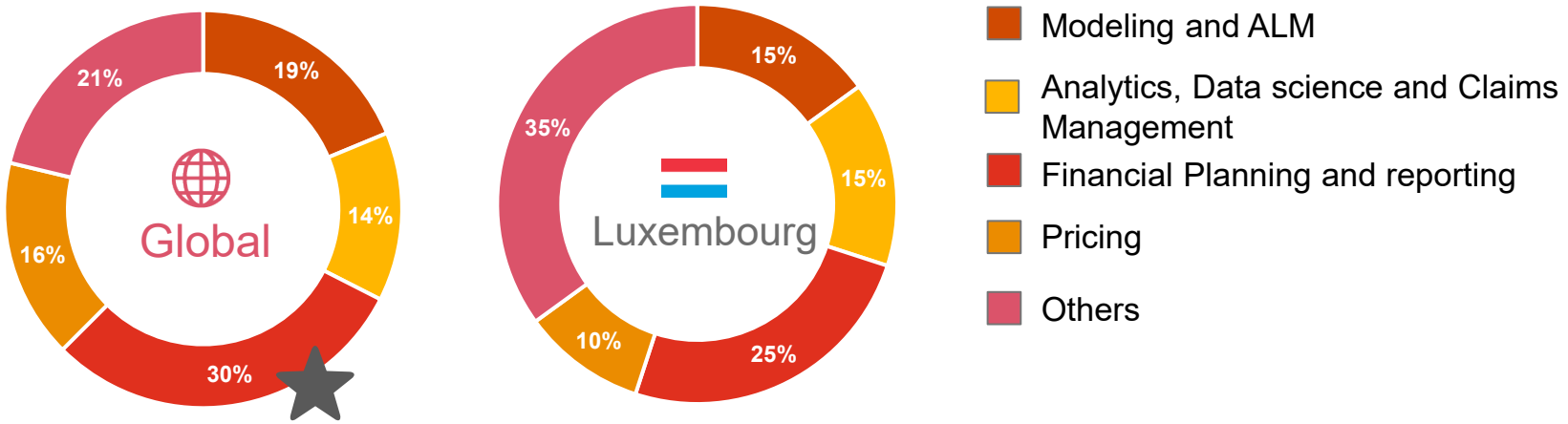
A very different situation was found in Luxembourg, where significantly greater problems were encountered in each of these challenges, especially **team culture, communication and turnover**.
Of particular importance were the communication challenges, which had the greatest impact and was reported by 67% of respondents.

Part 2. People

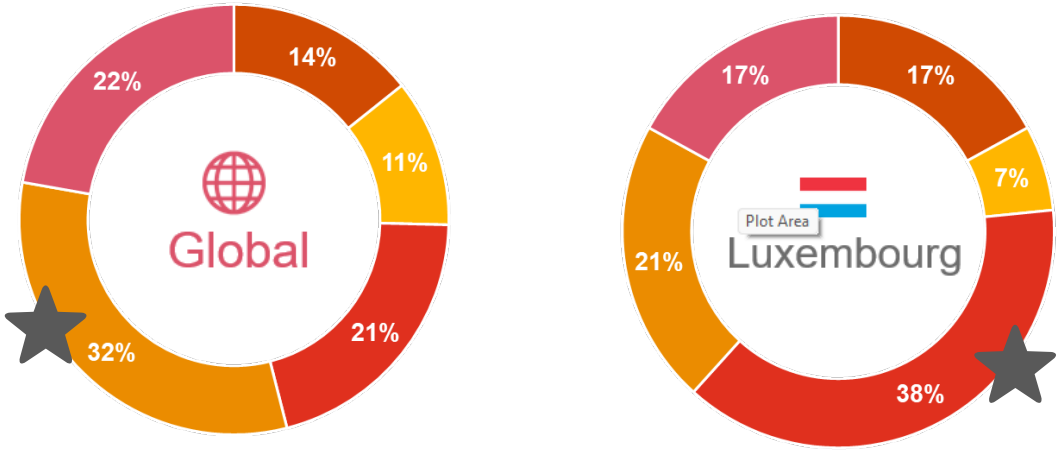
2. People

2.1 Share of time actuaries are working per type of activity

Life



P&C



- The actuarial role is not only evolving with new technologies, but actuaries are **increasingly participating in enterprise-wide modernization initiatives beyond their traditional scope.**
- More than 70% of respondents report that actuaries are involved in areas such as Data Science & Analytics, Cloud & Data Strategy, Generative AI, and Finance Systems Modernization.
- **Financial reporting and planning** are major fields actuaries work on at a global level, with Luxembourg showing no major differences
- Life insurers spend more time on data analytics vs pricing. While for P&C players the image is the opposite.

2. People

2.2 Skills and competences

Skills selected as the most important now

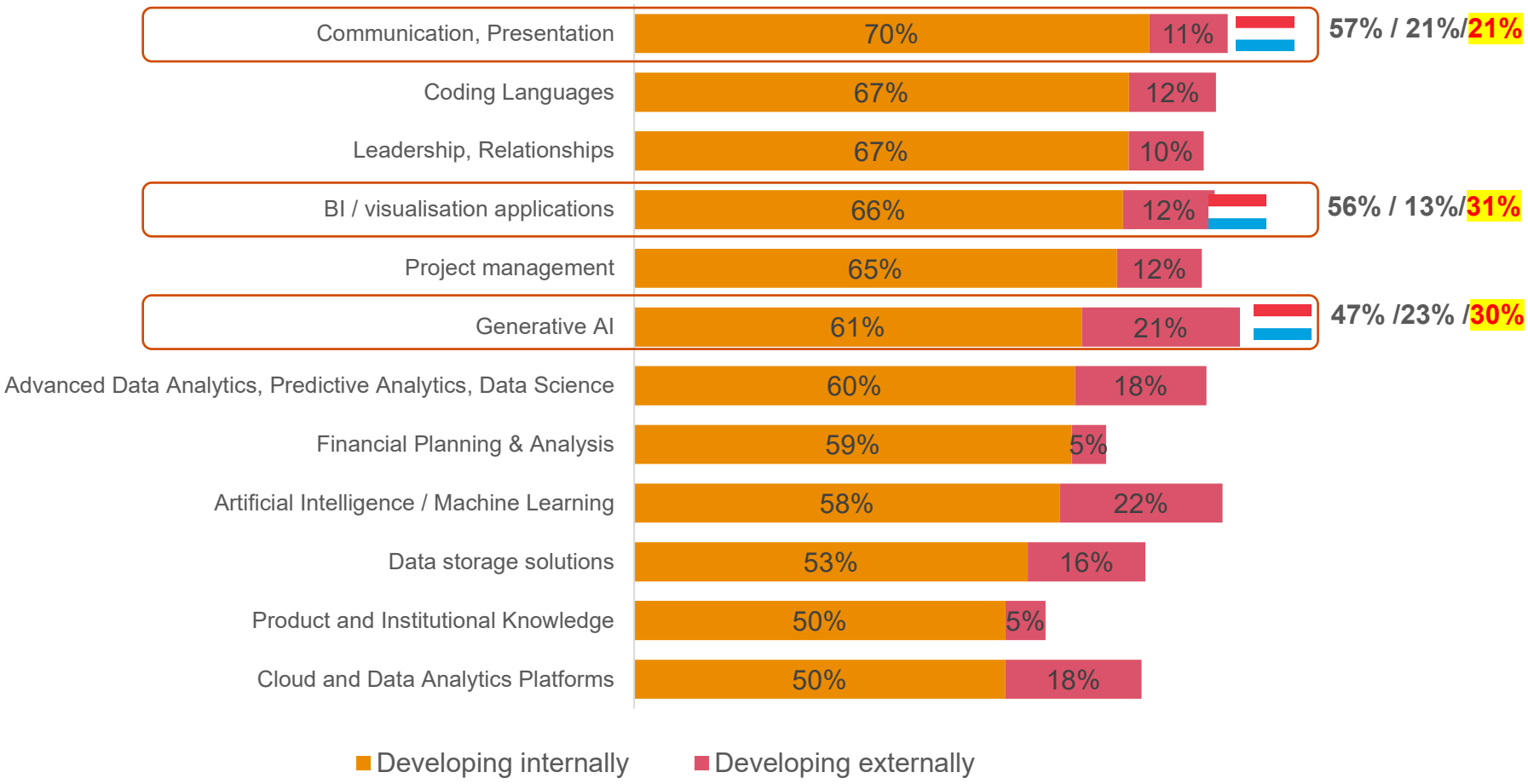
Global view

- Financial Reporting
- Reserving Analysis, Experience Studies & Assumption Setting
- Product Development, Pricing, Underwriting & Illustration
- Product and Institutional Knowledge
- Regulatory Knowledge

Luxembourg view

- Financial Reporting
- **Project management**
- Reserving Analysis, Experience Studies & Assumption Setting
- **Financial Planning and Analysis**
- Product and Institutional Knowledge
- **Coding languages**

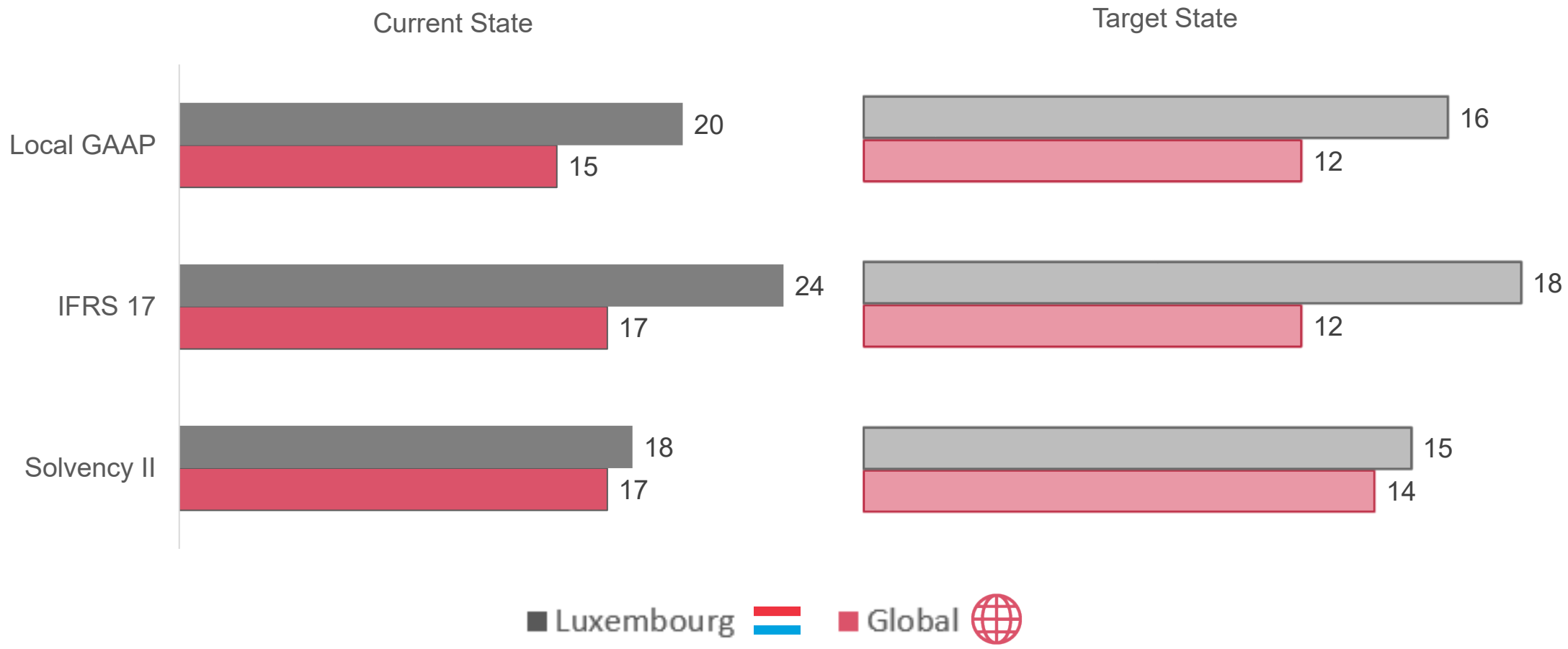
Question: What skills are you interested in developing?



Part 3. Process

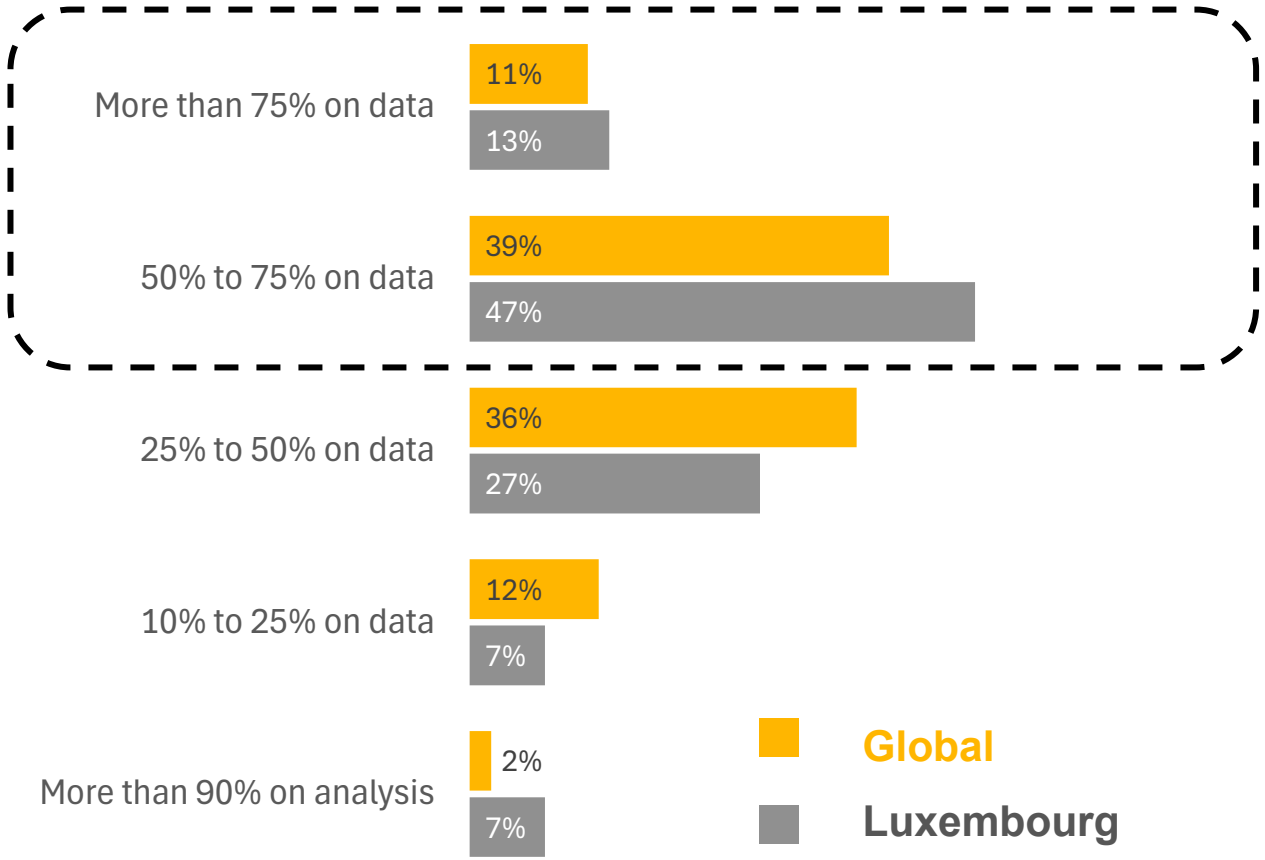
3. Process

3.1 Average completion time of the actuarial close process / deliver key actuarial reports (working days)



3. Process

3.2 Average proportion of time spent on data versus analysis



Actuaries are currently spending more than half of their time on data preparation instead of analysis, which falls short of the ideal state of spending less than a quarter of their time.

As the volume of data required increases, partially due to accounting changes, properly enabling teams to prepare data and other downstream processes such as visualisation or data analytics is a growing priority for companies.

Although companies are getting the data they need, they might not be getting the data they want. More than 70% of companies report they are able to obtain accurate and timely data, but less than half of companies indicate the data is standardised, automated, or in a single source of truth, suggesting loss of efficiency due to need of re-work.

<25%

time spent on data in target state

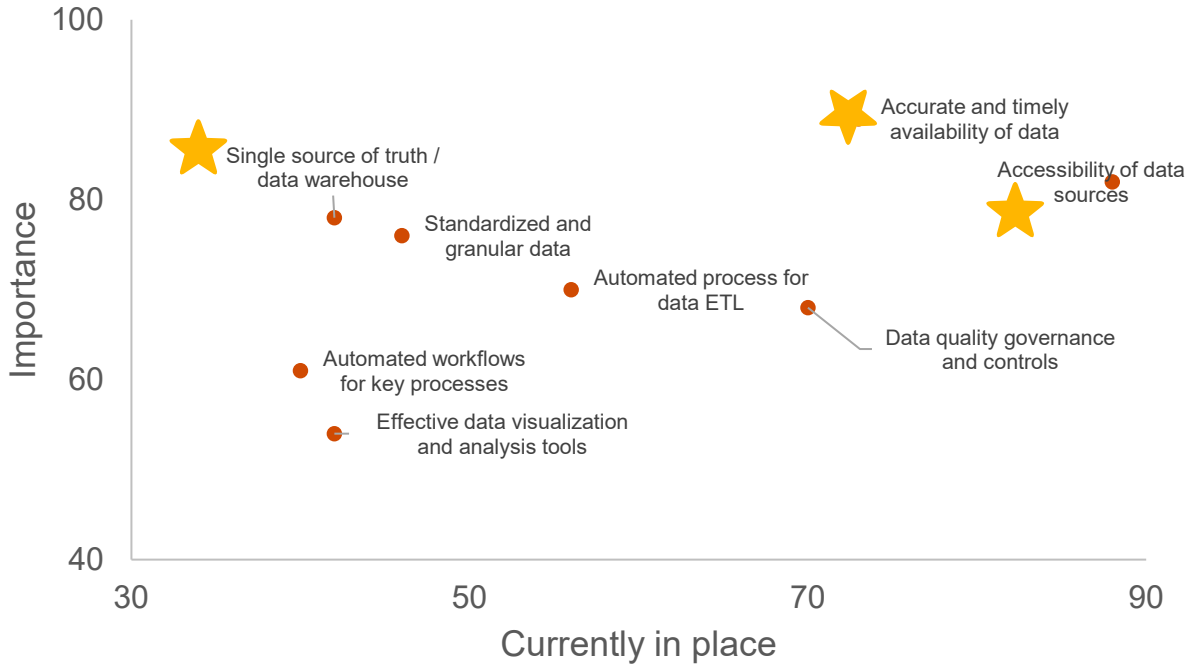
Part 4.Technology

4. Technology: Data

4.1 Data environment and technology attributes

Perceived as most important globally

- Accurate and timely availability of Data;
- Single source of truth / data warehouse;
- Accessibility of data sources;
- Standardised and granular data;
- Automated process for data ETL;
- Data quality governance and controls;
- Self service and automated reporting.

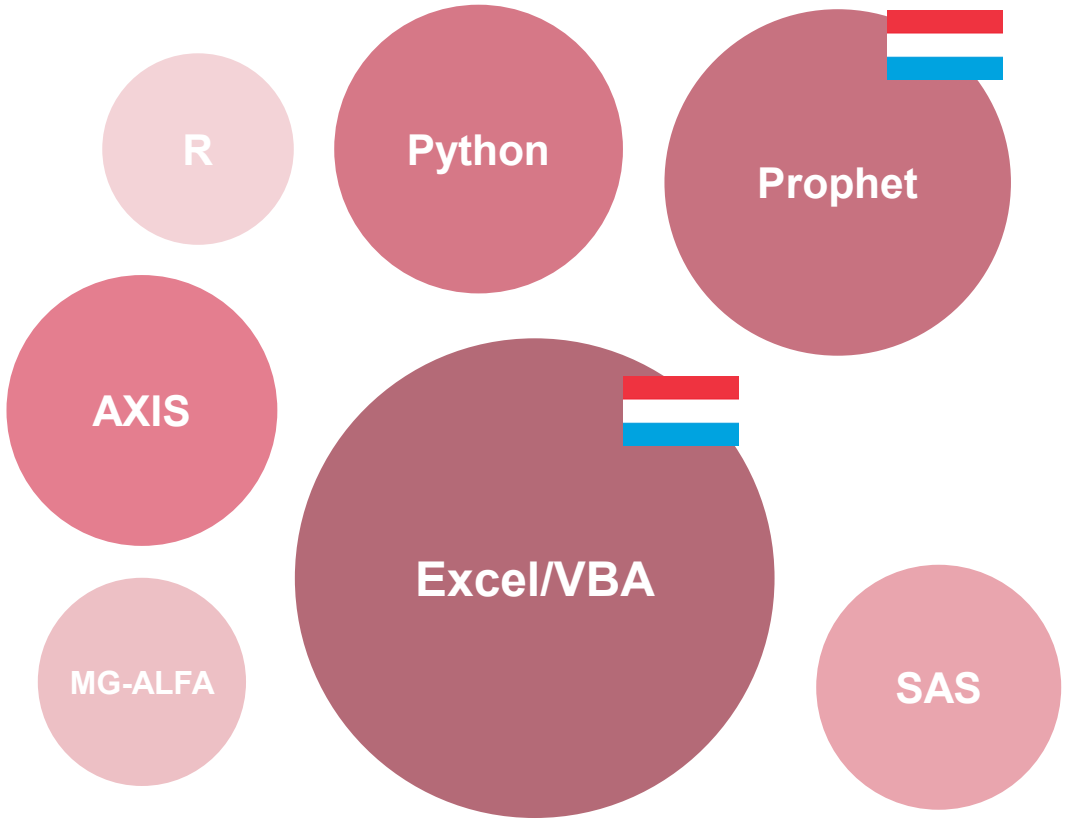


Data enrichment using external sources

- Economic data;
- Industry data;
- Climate data;
- Geodemographic data;
- Exposure data;
- Corporate Financial data.

4. Technology: Life

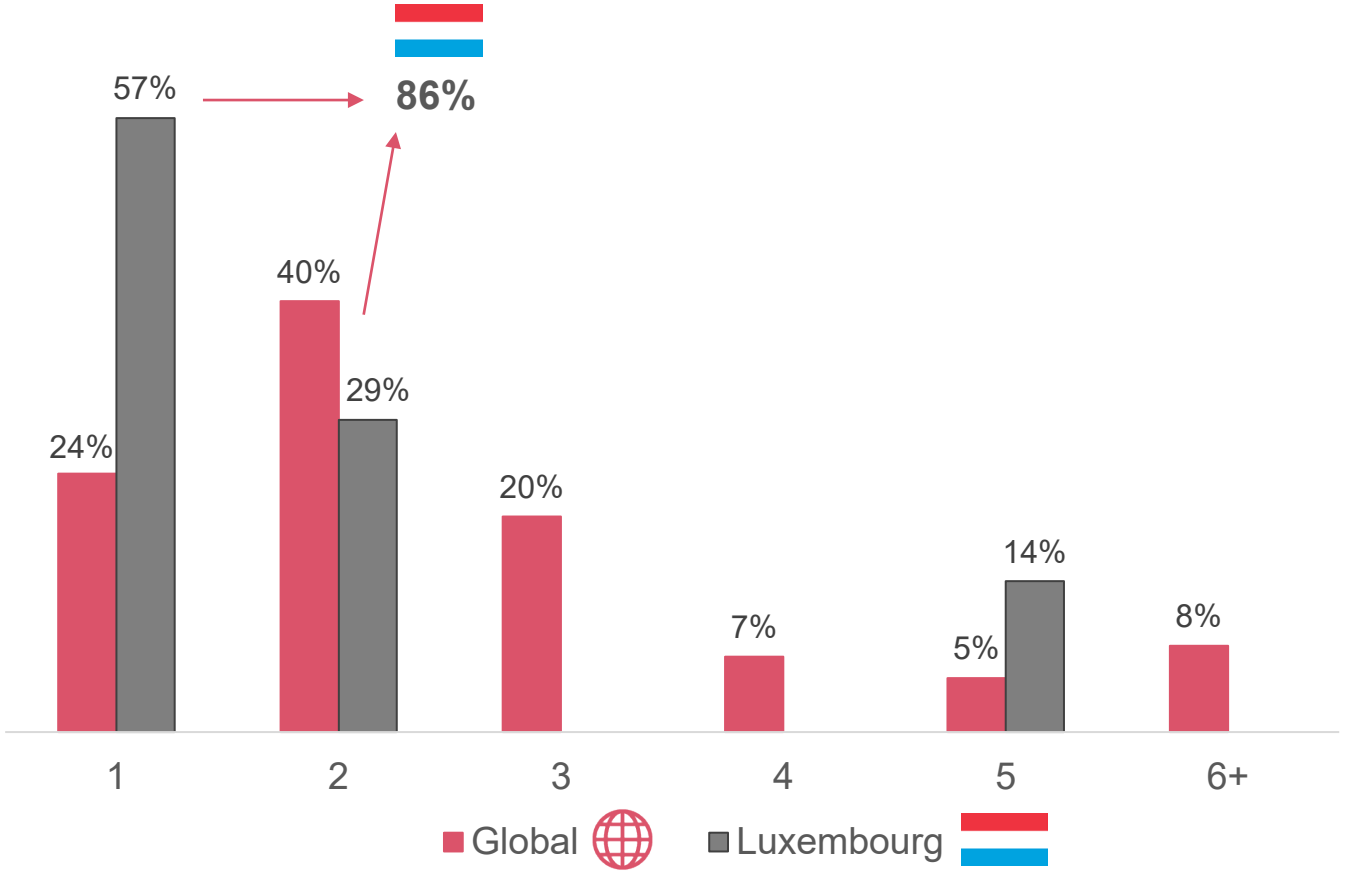
4.2 Actuarial modeling platform for valuation



Both globally and in Luxembourg, Excel and Prophet dominate as the leading actuarial platforms. This trend is even more pronounced in Luxembourg, where these two platforms are almost exclusively used, with **86%** and **57%** of respondents, respectively, reporting their usage.

4. Technology: Life

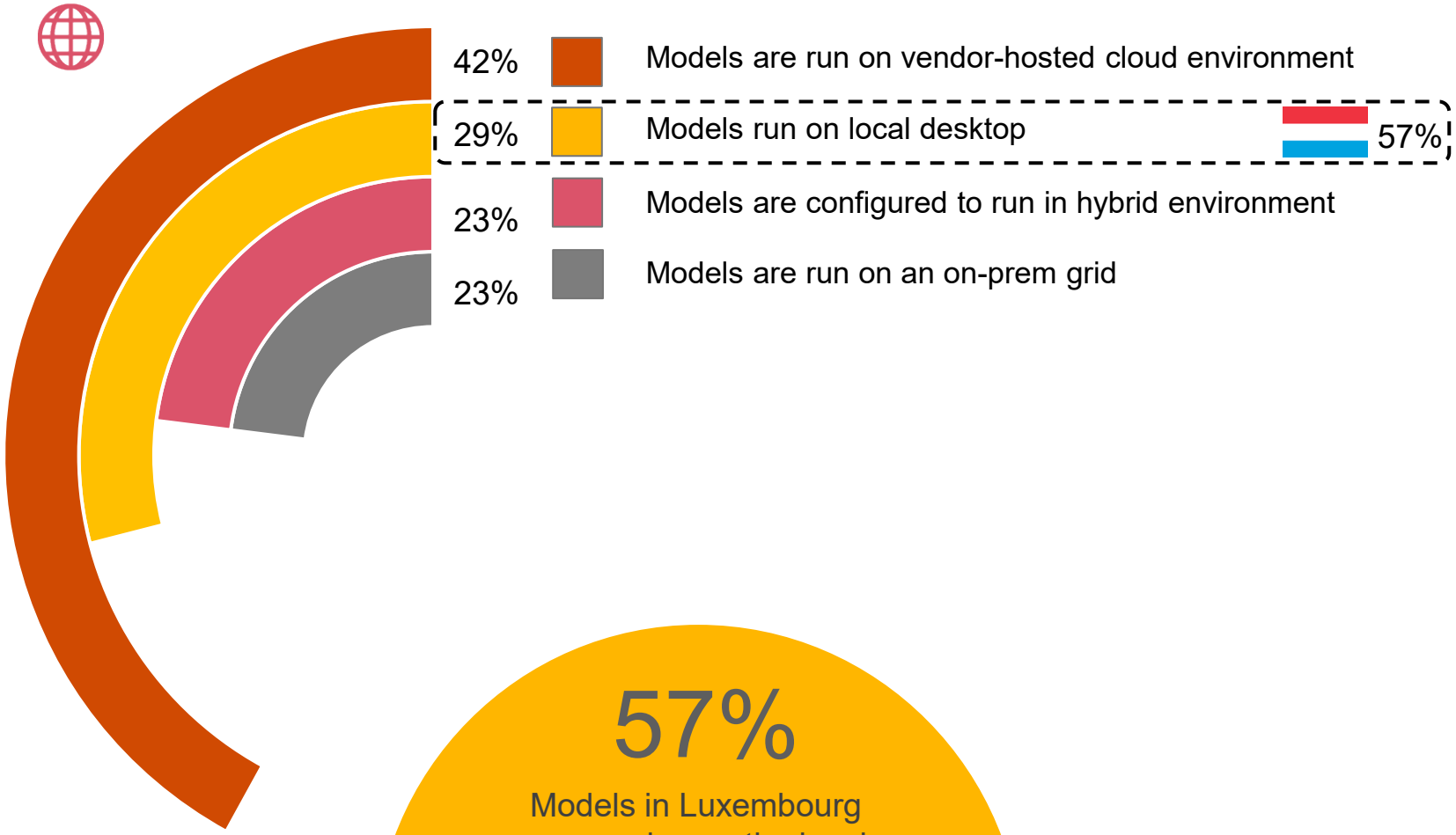
4.3 Number of actuarial modeling platforms



- The actuarial modeling platforms shown in the graph reflect global data, indicating that the vast majority of respondents use **no more than three platforms**. Luxembourg follows a similar trend, with 86% of respondents using **one or two actuarial modeling platforms.**
- **15%** of respondents in Luxembourg intend to switch to a **new platform** or solution compared to just **5% globally** who are planning a transition.

4. Technology: Life

4.4 Current status of actuarial modeling ecosystem



In Luxembourg, unlike at the global level, **models running on local desktops** is the dominant setup.

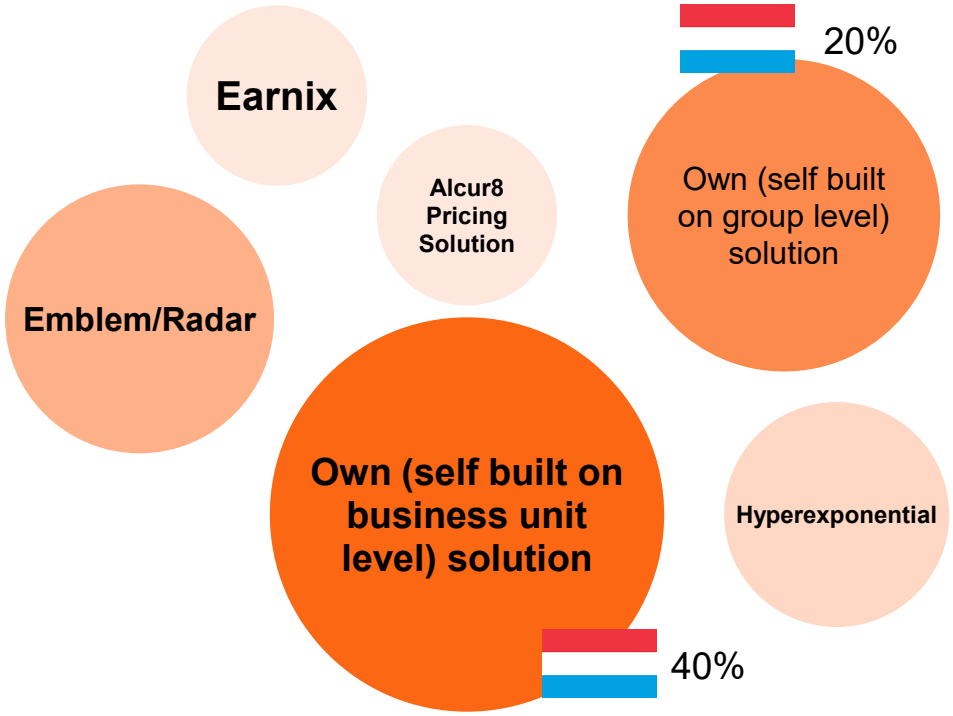
This can be explained by the volumes of business and by regulatory constraints.

There a clear room for ecosystem changes and those changes are inevitable.

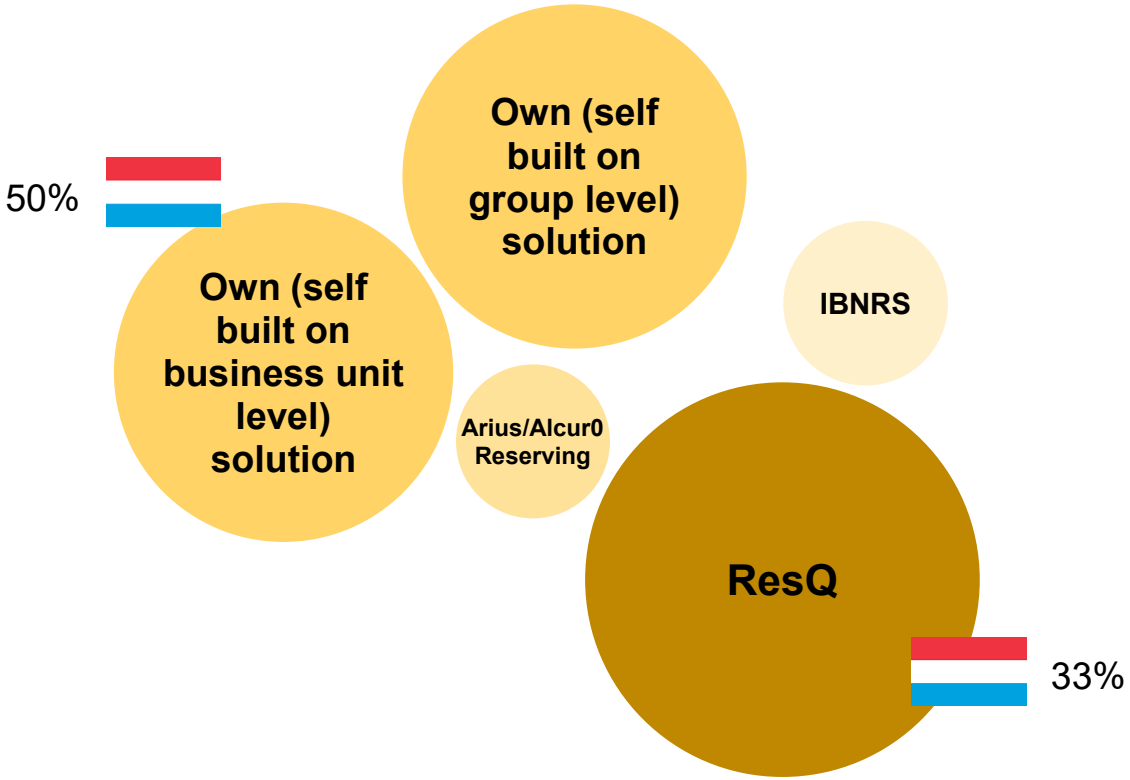
4. Technology: P&C

4.5 Current tools used

Pricing



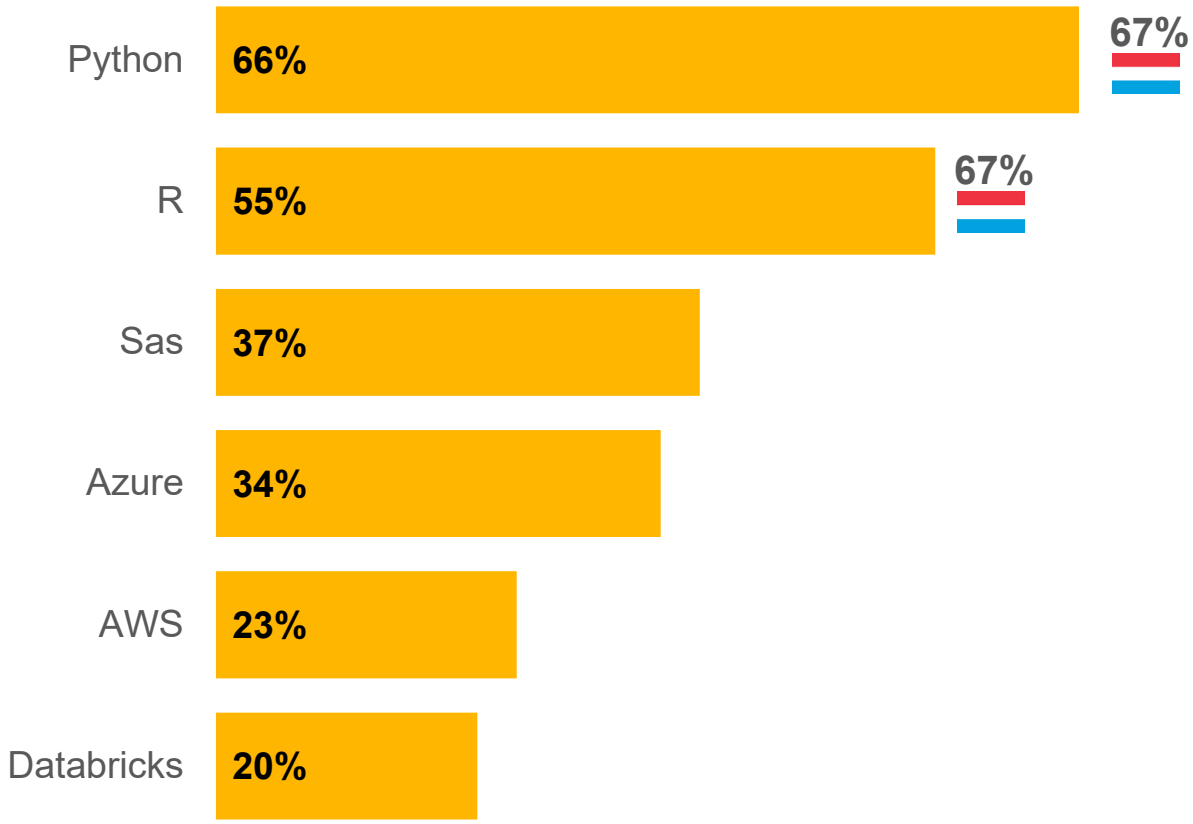
Reserving



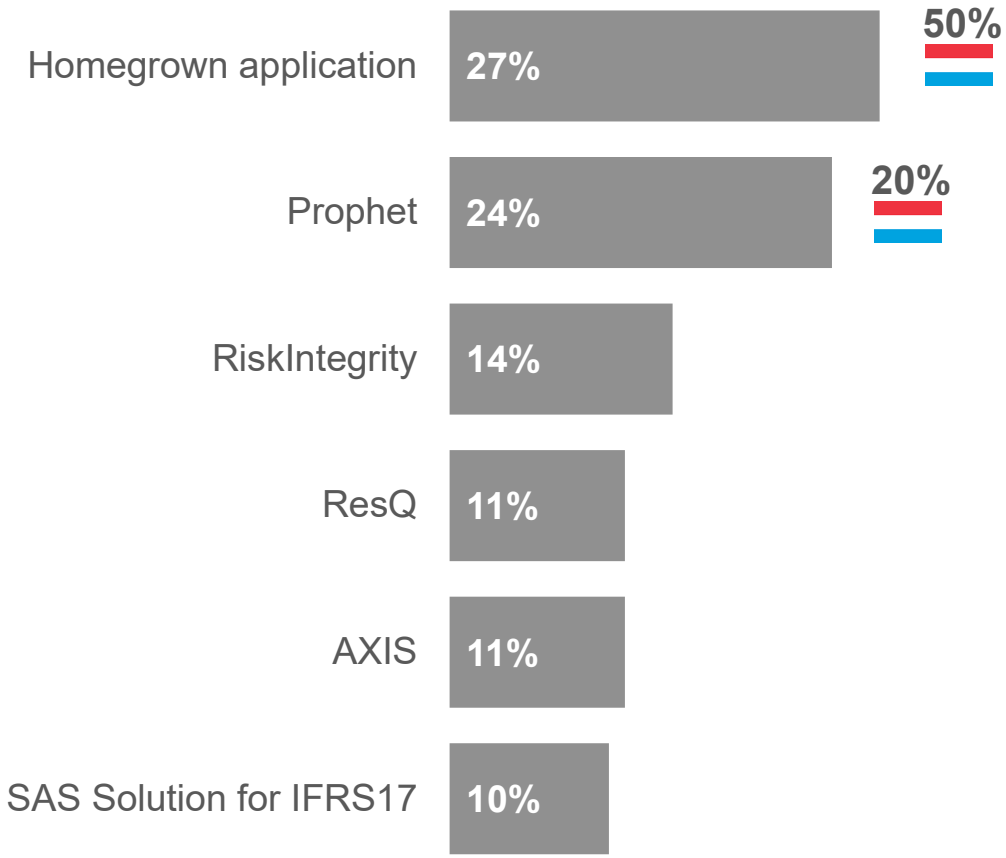
4. Technology - Platforms & Solutions

4.6 Current tools used

Data Analytics tools



IFRS17 tools



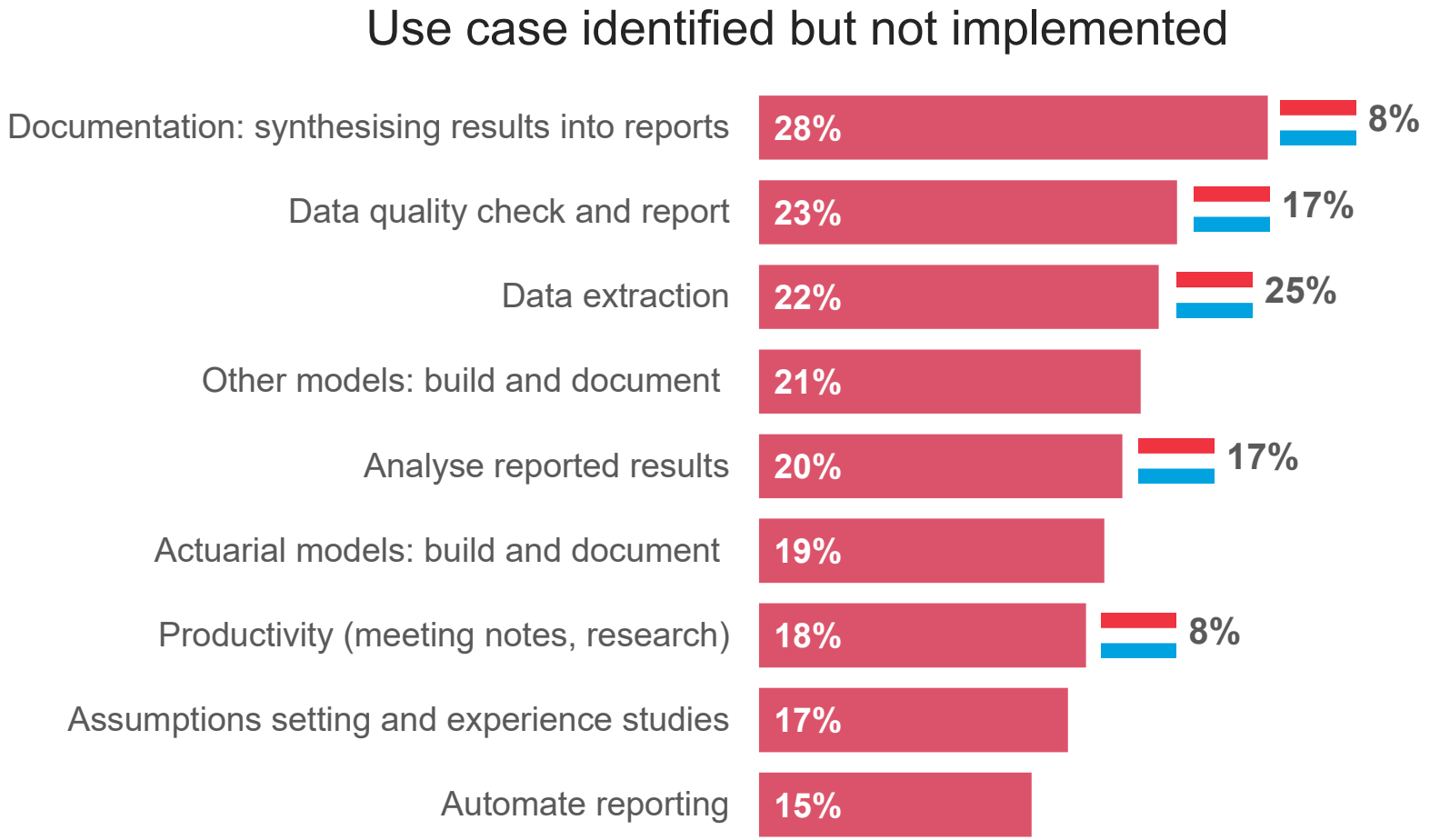
4. Technology: GenAI

4.7 GenAI assets and use cases

The survey underscores a pressing need for clearer value propositions and guidance, stronger integration strategies, and better capacity to scale GenAI beyond gathering use cases and implementing pilots. Many have yet to implement GenAI assets, although familiar platforms like Microsoft Copilot and ChatGPT Enterprise are emerging as popular starting points.

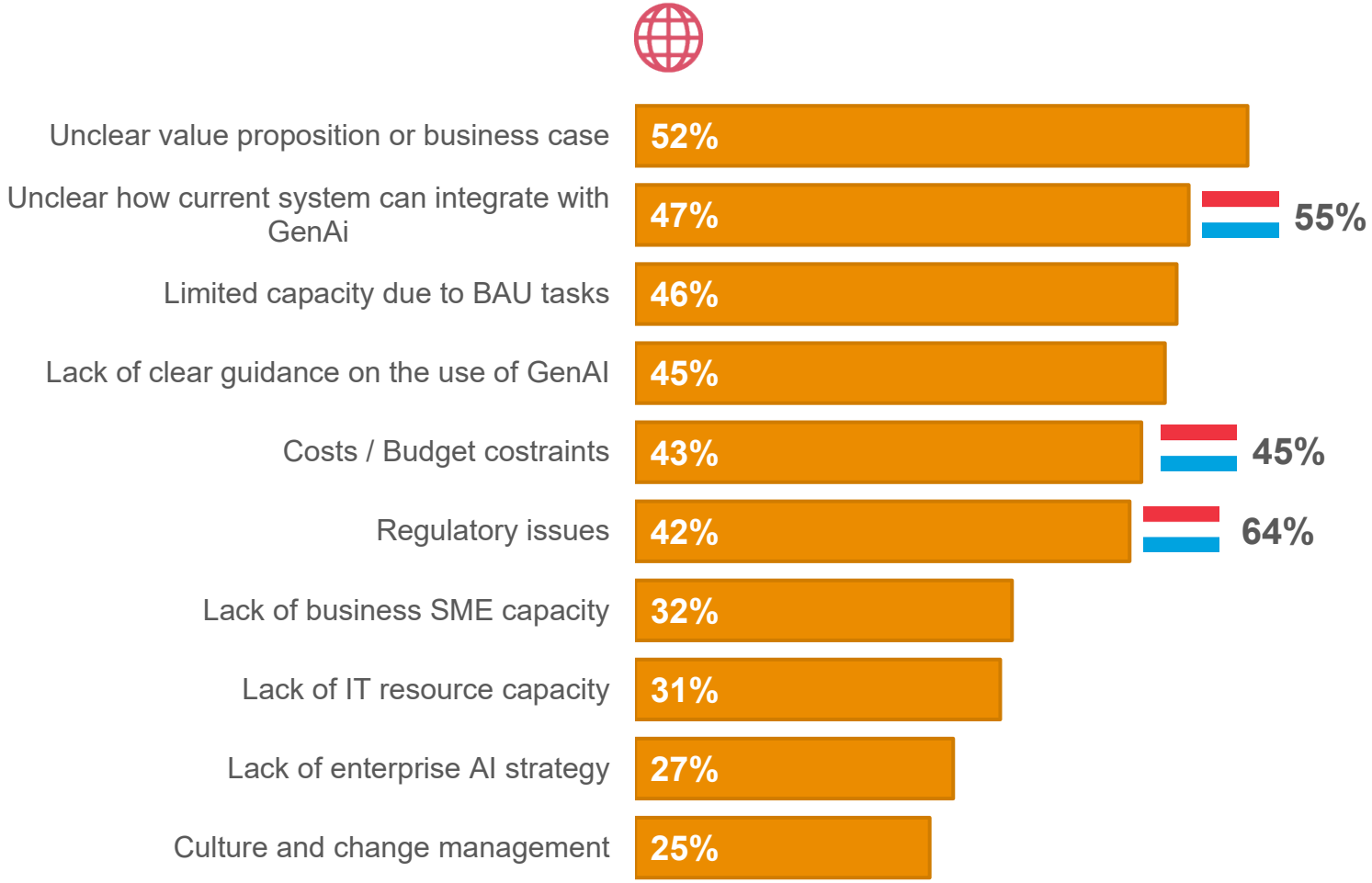
11%

of participants say GenAI is already implemented with substantial benefits in modeling and productivity.



4. Technology: GenAI

4.8 Constraints faced in using GenAI



- Globally, the key constraints for GenAI adoption include an **unclear value proposition** or business case, uncertainty around integrating existing systems with GenAI, and limited capacity.
- In contrast, in Luxembourg, the main challenges stem from r**egulatory concerns, cost and budget constraints**, and uncertainties around system integration with GenAI.

Closing remarks

Key takeaways of 2025 Global Actuarial Modernisation Survey

Similarities with the Global view

01 **Process efficiency and quality** are among the key drivers of actuarial transformation, both globally and in Luxembourg.

02 There is a clear gap between **the skills set** actuarial department currently have and the ones they see as important in future. Globally as well as in Luxembourg we need to master in Predictive Analytics and GenAI in the near future.

03 Actuaries globally, including in Luxembourg, spend **over 50%** of their time on **data preparation.** That is far from the ideal scenario where their focus should be on data analysis and delivering management insights.

04 The data is a key to everything and globally there are still a lot issues to improve, mainly accurate and timely availability of data, accessibility of data sources and having a **Single source of truth.**

Main differences Global vs Luxembourg

01 **Modernisation journey has started,** however Luxembourg is at the early stage compared to other markets and there still a lot of technical and processes improvements ahead.

02 **More outsourcing:** Globally, outsourcing of the key actuarial activities is recognized as good option to take, however in Luxembourg we outsource twice more and with a focus on process improvement.

03 **Higher demand for changes:** in Luxembourg 3 times higher level of intention to change the existing actuarial and reporting platform compared to the global market.

04 **Move to cloud and AI:** Globally, approximately majority of respondents now run their models in a cloud environment, whereas in Luxembourg we still largely rely on local machines.

What is needed: Initiate the change

Actuarial Modernisation forms the basis to achieve many essential goals of an actuarial department, and it contributes directly to enterprise-wide success. Several points are important for a successful implementation.

1. **Make Actuarial Modernisation your top priority**. Develop a clear vision and a future proof target state. Derive a clear implementation roadmap with quick wins, realised benefits and tangible outcomes.
2. **Increase the level of your process automation** and focus on initiatives with the highest outcome to effort ratio. This will free up your resources and convince stakeholders to invest in your actuarial modernisation initiatives.
3. **Embrace new technologies and be open minded**. Stay informed about the potential benefits of cloud, RPA and AI technologies, and keep track of their ongoing advancements.
4. **Clarify and improve interfaces** to ensure effective collaboration between your actuarial function and other departments, particularly IT and Chief Data Officer. Clearly define the respective responsibilities.
5. **Handle actuarial modernisation as an integral part of a wider FAIR (finance, actuarial, investment and risk)** transformation. Take an active leadership role in company-wide modernisation initiatives that align with your goals.
6. **Don’t forget your people**. Managing and embracing the process and technology changes are key to your actuaries embracing and benefiting from your actuarial modernisation investment.
7. **Focus on your key initiatives and get help where it is needed**.

Thank you

Pavel Kostyuchenko

Partner, Actuary at PwC Luxembourg

Alina Vorontsova

Director, Actuary at PwC Luxembourg

Harshita Jain

Manager, Actuary at PwC Luxembourg

www.pwc.lu