

Actuarial Systems

2nd Indonesian Actuaries Summit

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Irene Xu, Senior Consulting Manager
Harrod Law, Senior Actuarial Consultant

Empowering
the Financial World



Agenda

I. Impact of IFRS17 on Actuarial systems

II. Plan your actuarial systems

1. An overview of modelling tools
2. Enhance data management and reporting capabilities
3. Governance and control of data processing
4. Ensure business as usual

III. FIS and Prophet

1.

Impact of IFRS17 on Actuarial systems



How will IFRS 17 Make A Difference?

The draft IFRS 17 standard focus on classification and the corresponding calculation of accounting items. Compared to Solvency II or regimes alike, less focus is placed on governance.

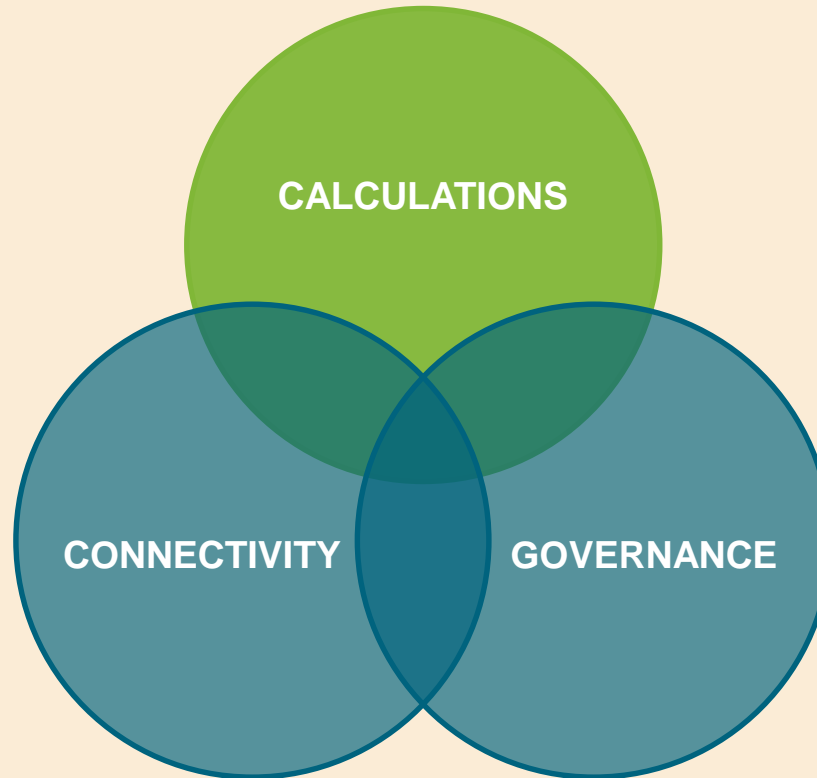
However, as an accountancy standard, IFRS reporting necessitates high level of governance.

- Sarbanes–Oxley Act of 2002 is enacted in response to accounting scandals in WorldCom and ENRON. Would companies adopt **IFRS 17 controls** equivalent to SOX?
- Actuarial process will be enhanced to ensure **accuracy of financial reports**. Stronger audit trails and less reliance on manual interruption and excel spreadsheets are required.
- IFRS requires frequent exchange of information between actuarial and finance systems, which is supported by a **common data language**.

Actuarial systems is the success factor of IFRS.

Key Drivers

BUSINESS AS USUAL



Calculation Tool for IFRS 17

- **IFRS 17 is a new accounting standard for insurance contracts. It represents a fundamental change how profit and risks are accounted for.**
- **A IFRS 17 modelling tool should be able to:**

Support IFRS reporting for all types of asset, liability and products

Easy to use

Flexible matrix reporting

Minimal model development effort

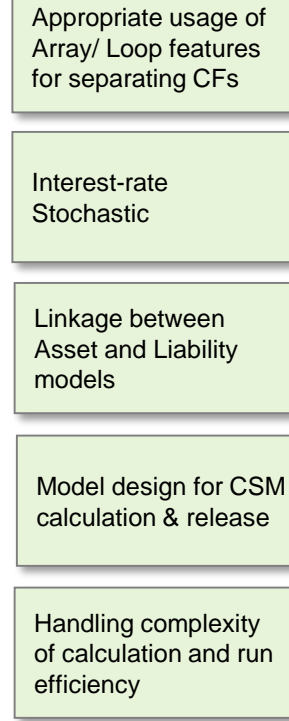
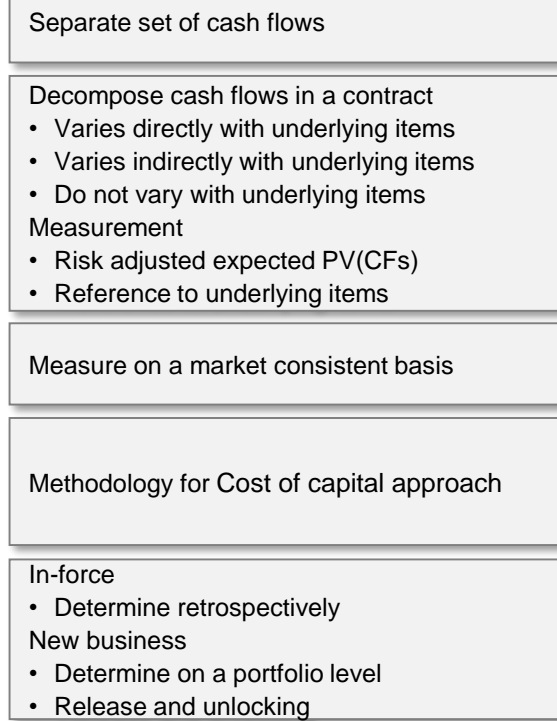
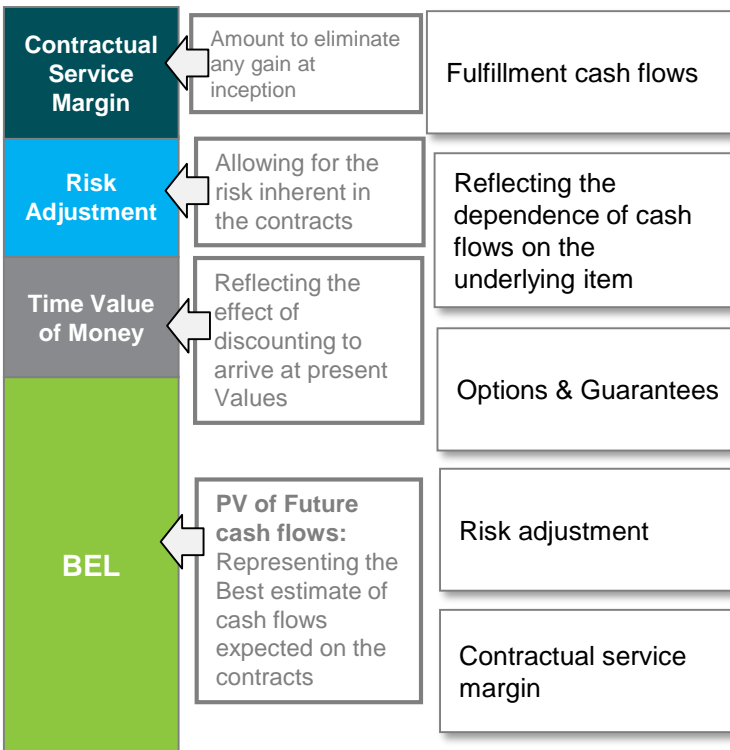
Share-able by all actuarial functions: pricing, capital management, valuation

Modeling Requirement for IFRS 17

Latest IFRS17 Requirements

Modeling Requirements and Considerations

[BBA Liability]

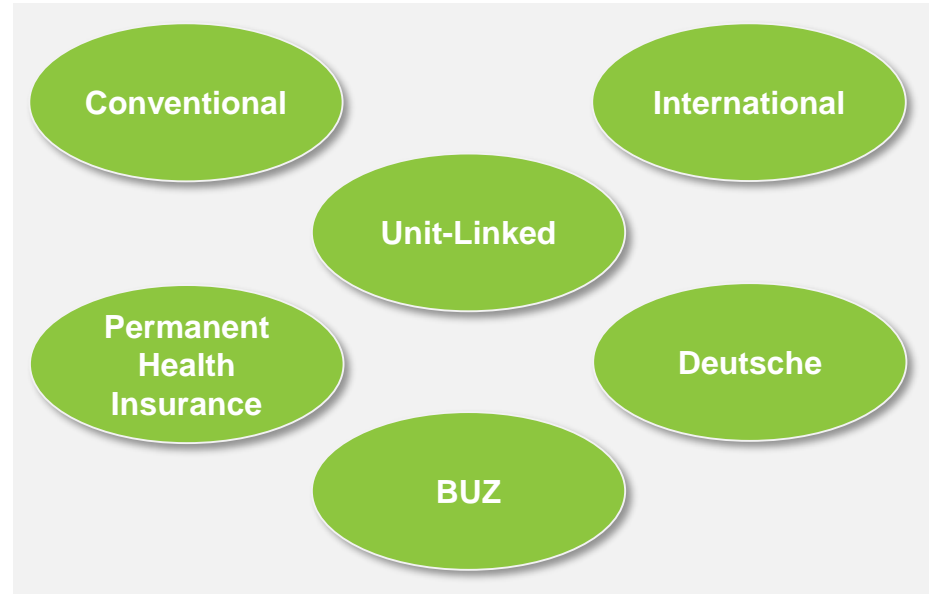
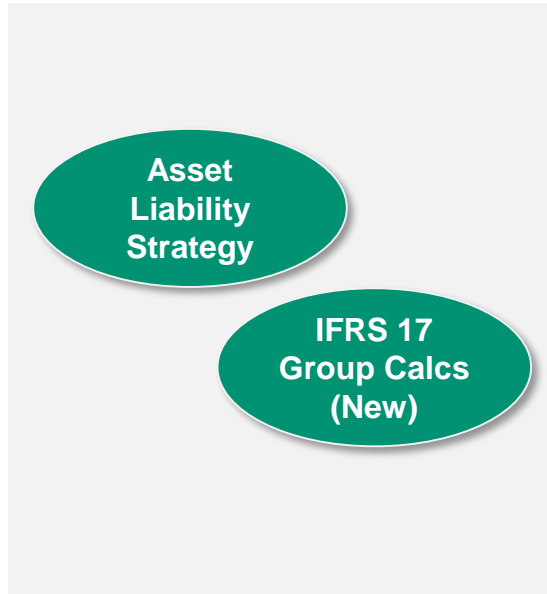


Scope of Library Calculations for IFRS 17

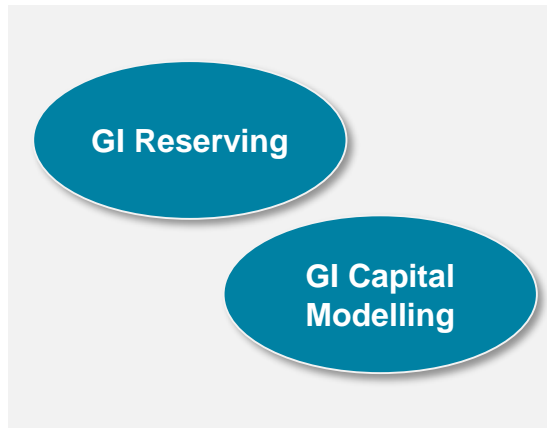
Group Calculations

Individual Policy Calculations

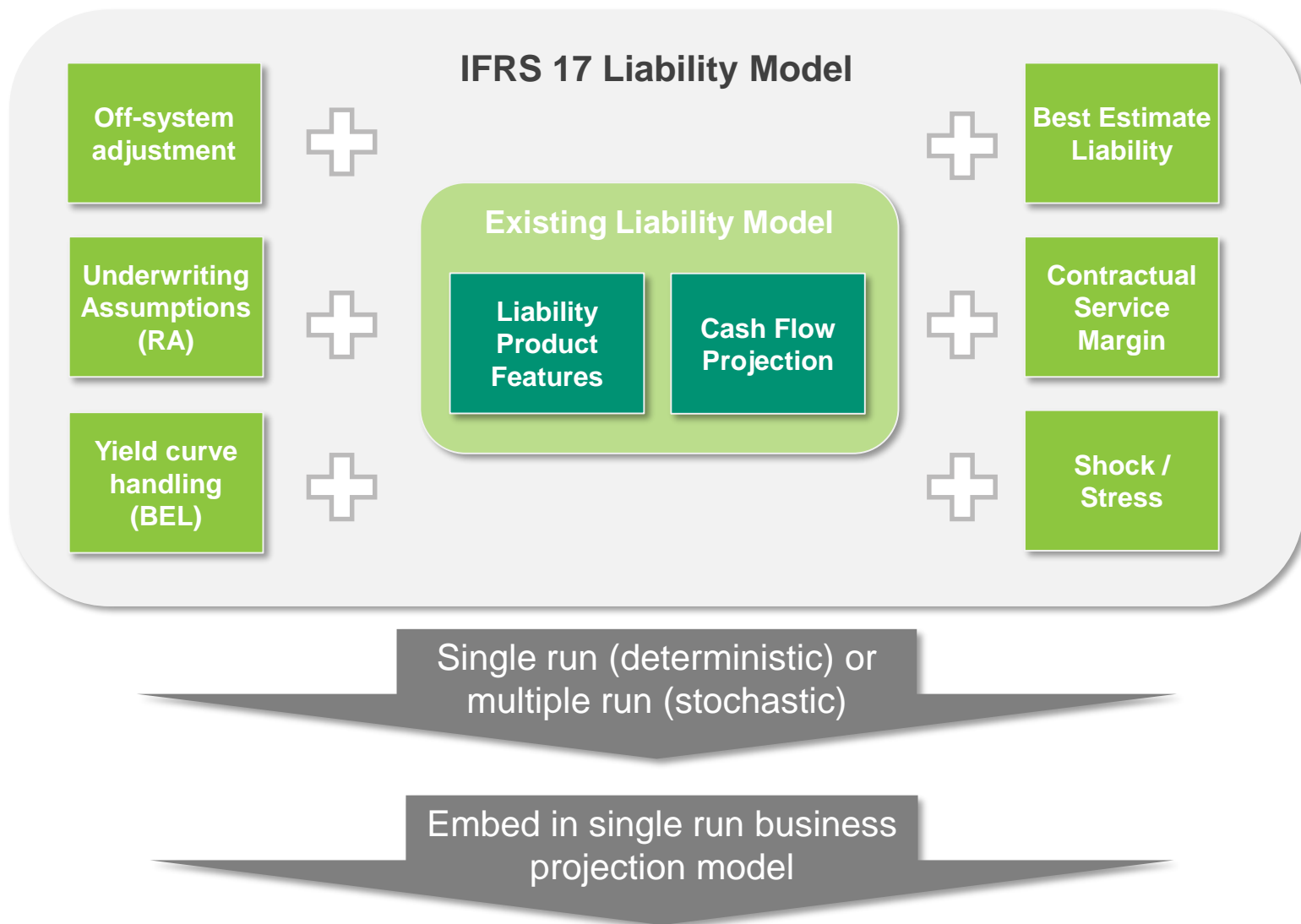
Long Term
Contracts



Short Term
Contracts



Layer on Existing Models



Use of Existing Liability Models for BBA

It is our view that IFRS 17 calculations are best achieved through an additional layer on top of existing models built for Solvency II-style RBC reporting

Re-use of existing models can reduce both implementation effort and subsequent maintenance costs, as well as the risk of future divergence between models

The CSM is an additional item not currently modelled

There is no explicit capital measure included on the IFRS 17 balance sheet

Contractual Service Margin

Solvency Capital Requirement

Reuse BEL in S2 for discounted future cash flow calculation in IFRS 17.

Reuse Cost of Capital and Solvency Capital Requirement in S2 Risk Margin for determining Risk Adjustment under IFRS 17

Fulfilment Cash Flows

Risk Adjustment

Time Value of Money

Future Cash Flows

IFRS 17

Risk Margin

Best Estimate Liability

Solvency II

Technical Provisions

Governance and Connectivity

Why Governance and Connectivity?

We expect that IFRS, as an accounting standard, will create big change impact to governance and data connectivity.

One implication of IFRS is that actuarial models will be the core of the financial reporting process for insurance companies.

Accuracy of financial reports and disclosures are required without compromising speed in closing.

This requires a programmed process without manual interruption.

How does FIS support?

In this respect, FIS provide several solutions to ensure:

Review and approval of the Inputs to models

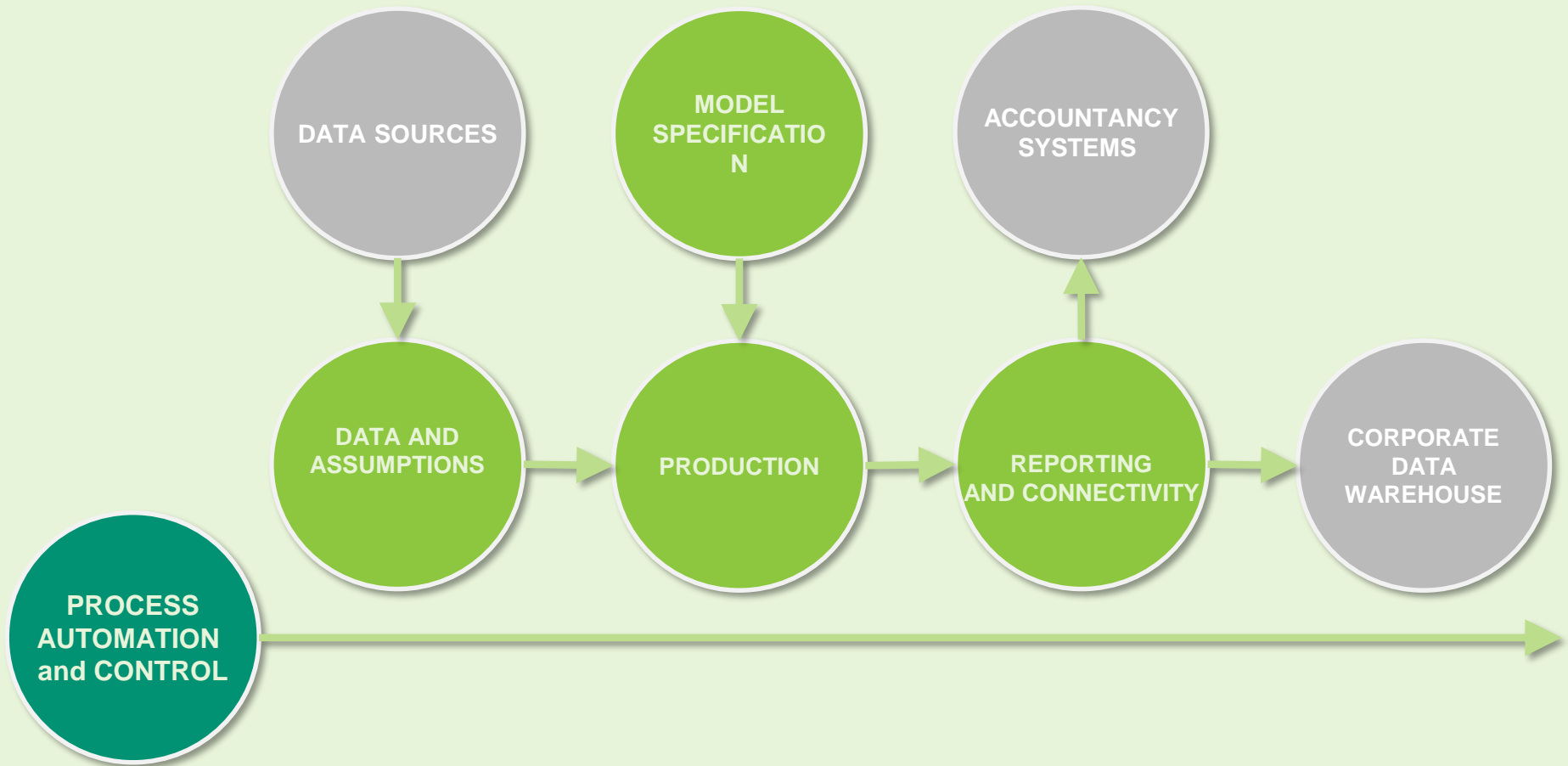
Results are generated from the verified inputs

A versioned, secured and auditable data (and history) repository

Automated traceability of production data flow

Universal consume-ability of actuarial results

Reference Architecture



Business As Usual

Can my IT catch up those Actuarial Systems and support my BAU smoothly?

Is there any other ways to help?

- **Cloud computing offers some unambiguous advantages for actuarial software.**
 - Costs saving: reportedly 30-40%
 - Performance: scalable calculation power and resilience to infrastructure failure
 - All-in-one: Our Cloud maintenance know how to support actuarial software best!
- **The Cloud optimizes usage**
 - Each model run is costed in the Cloud.
 - This encourages efficient run execution plan.

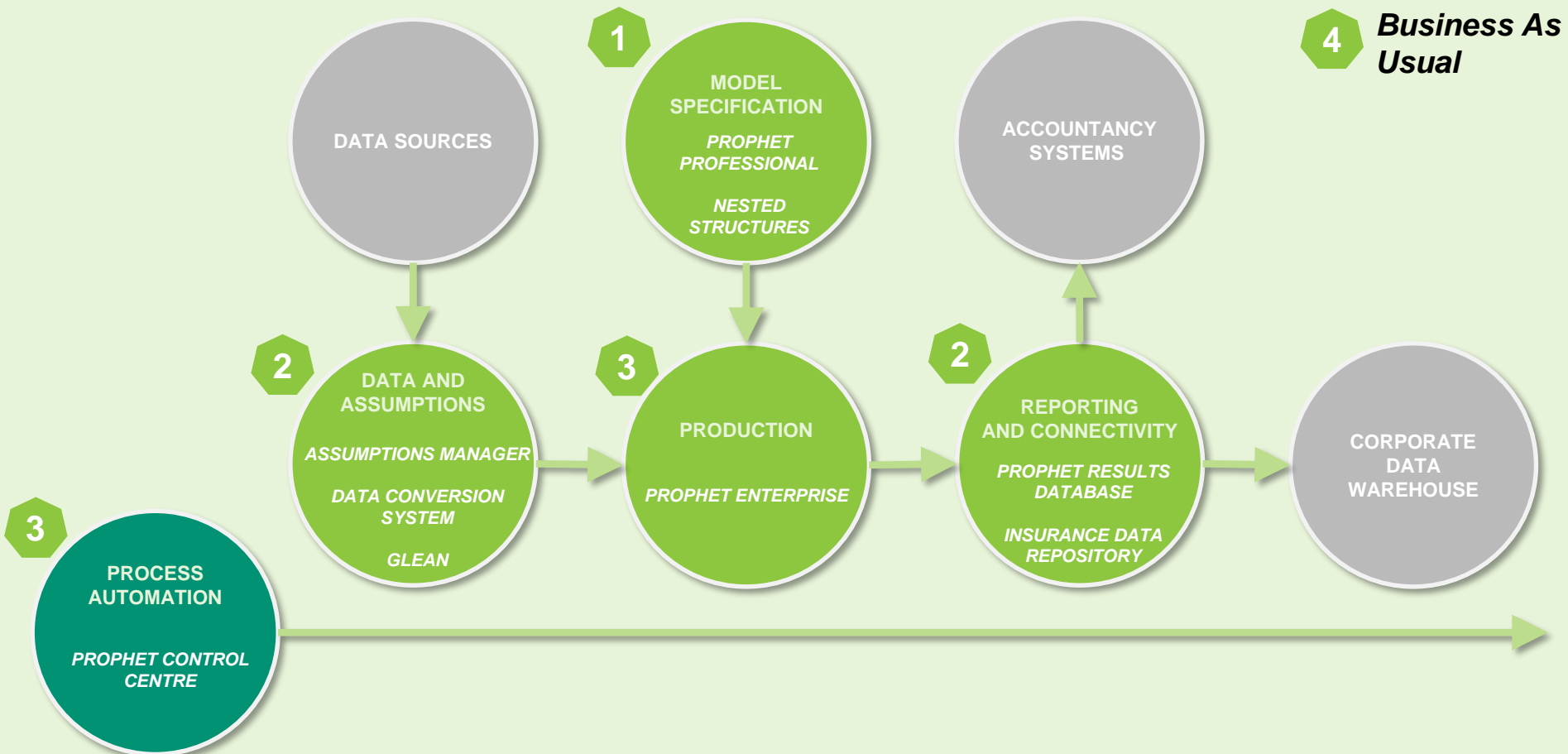
2.

Plan your actuarial systems



Plan Your Actuarial Systems

- Plan your actuarial systems via below focuses:
 1. Select modelling tools
 2. Enhance data management and reporting capabilities
 3. Governance and control of data processing
 4. Ensure business as usual



1. An Overview of Modelling Tools

What Qualifies A Good Actuarial Model?

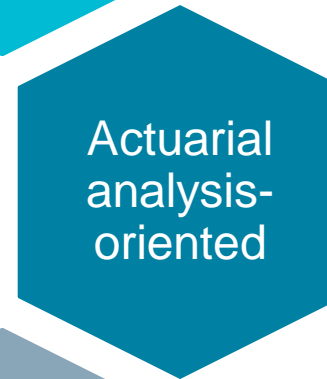
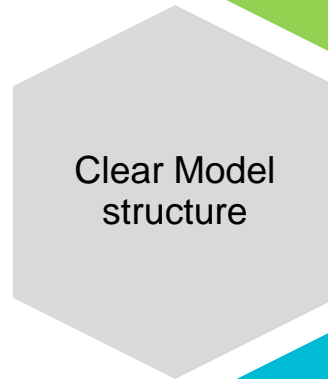
Model that allows single-platform operations for:

- Valuation
- Analysis
- Pricing
- Risk reporting
- Business Planning



Solvency II is no longer an European-only capital regime.

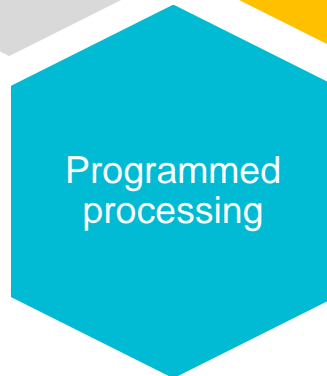
Pillar 2 focuses on Controls and Governance.



Enable actuarial transformation,

- from valuation
- to analysis and
- to ultimately analytics

- Separation of data and calculation
- Modularity
- Transparency
- Customizable



Including:

- Services enhancement
- Lead the governance change
- Pioneer technology advancement

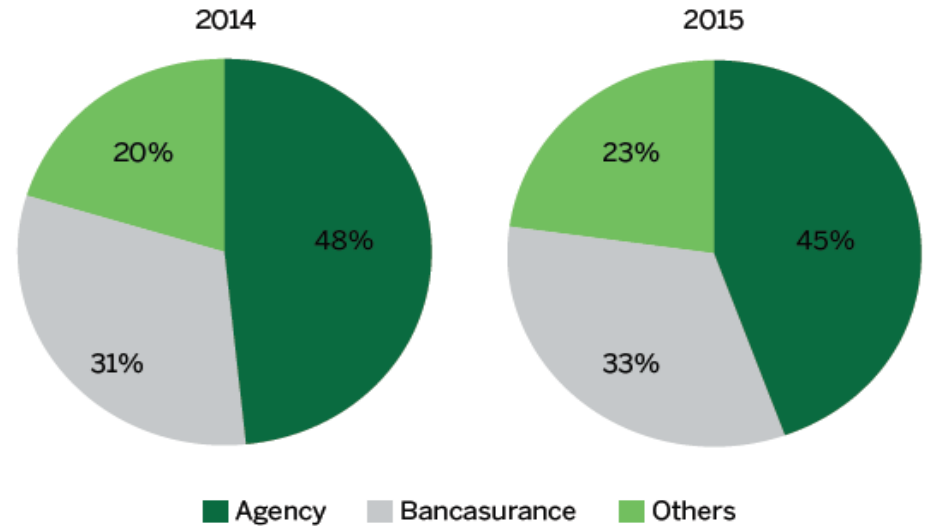
Meaning:

- Predefined procedures
- Automation
- Risk alert
- Scalable with machine farm

What is the role of actuarial model in Indonesia?

Characteristics of Indonesian Insurance Market

- Strong and rapid growth
- Increasing Product diversity
- Need fast analysis turnaround
- Active actuary job market
- Need more qualified actuaries
- Regulation



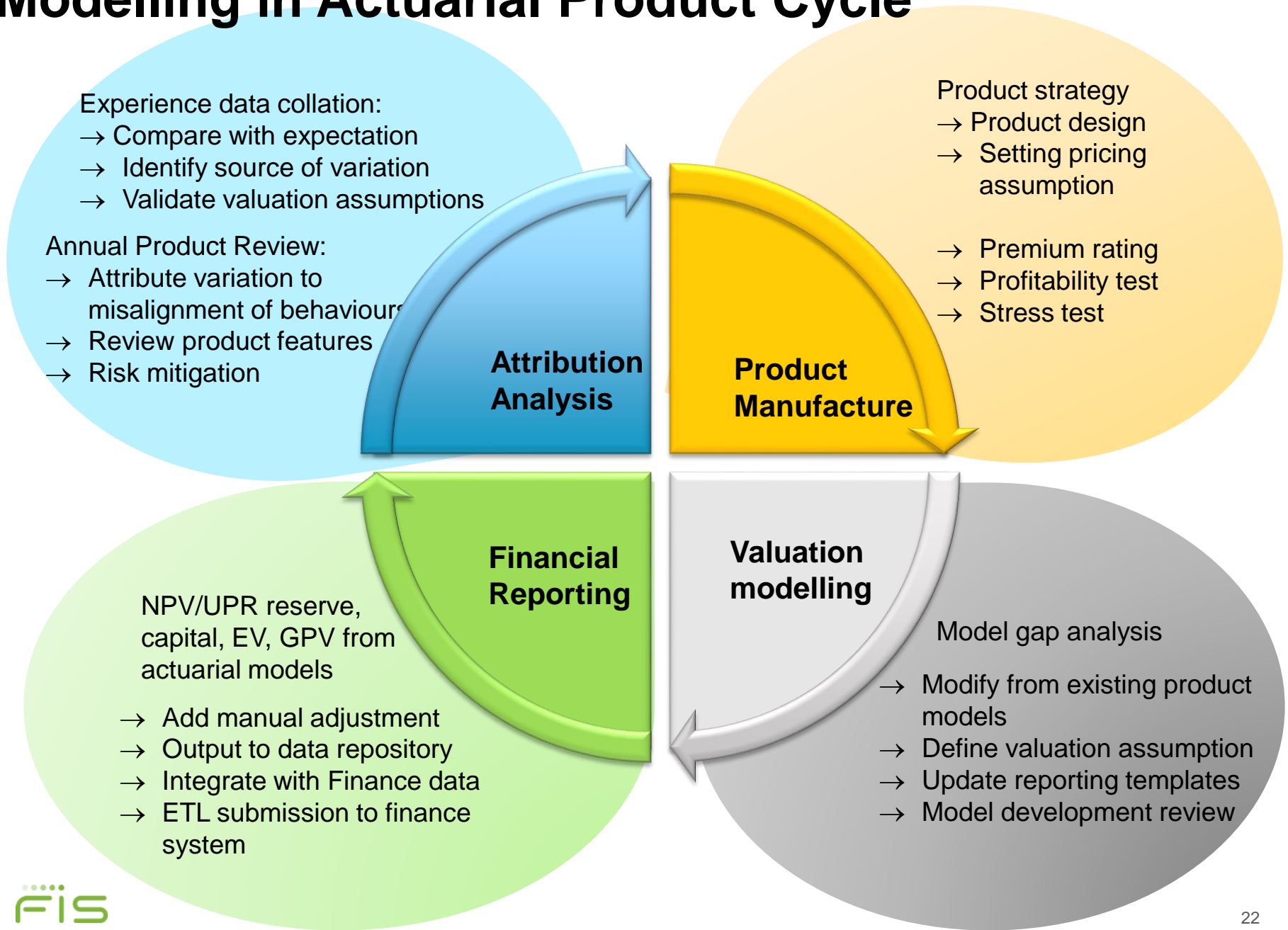
Source: AAJI

**How to choose the right
actuarial modelling tool?**

An Overview of Modelling Tools for Indonesia

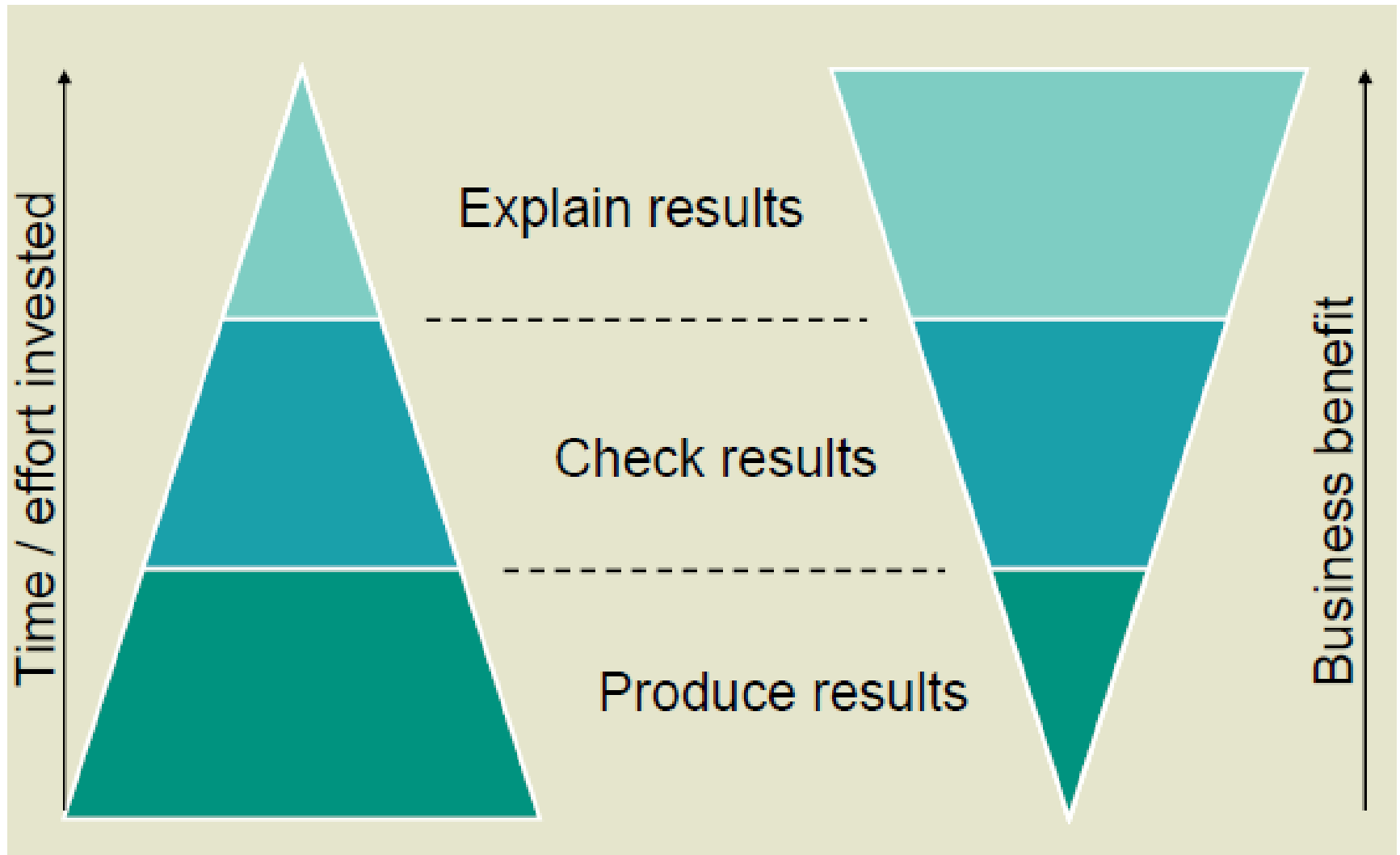
Category	Description	In-house excel tool	Excel add-ins	Vendor system
Operations	Operating platform	Disconnected		Single unified platform
	Ease of deployment	High		High for desktop application
	Transparency	Low. Users trace calculation manually		High possibly
	User friendliness	Depends		High if does not need programming skill
Business Management	Impact from talent loss	High, since tools are in-house built	Medium	Medium to High
	Support for increasing product diversity	Low because of excel unscalability		High given strong product development
	Support for business growth	Low		High given multi-core function
	Readiness for Regulatory change	Low because of excel unscalability	High given strong R&D support	
Process controls and innovation	Access controls	Low, without separation of data, model		Medium to High
	Process oversight	Low	Depends	Medium to High
	Data governance	Low	Depends	Medium to High
	Auditability	Low	Depends	Medium to High

Modelling in Actuarial Product Cycle



2. Enhance Data Management and Reporting Capabilities

Why Need to Change



Objectives of The Changes

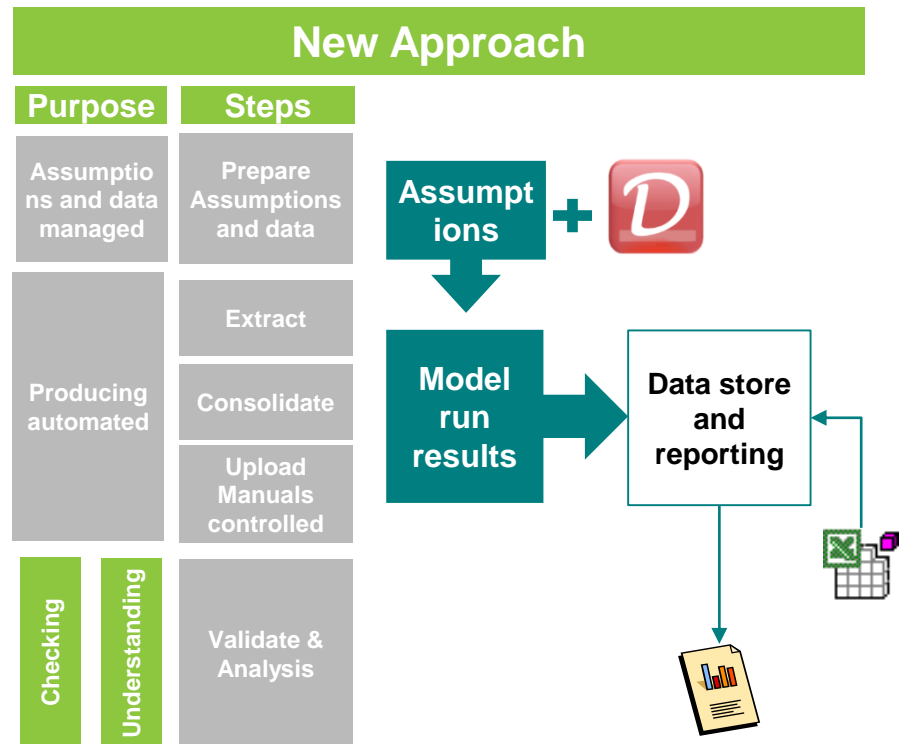
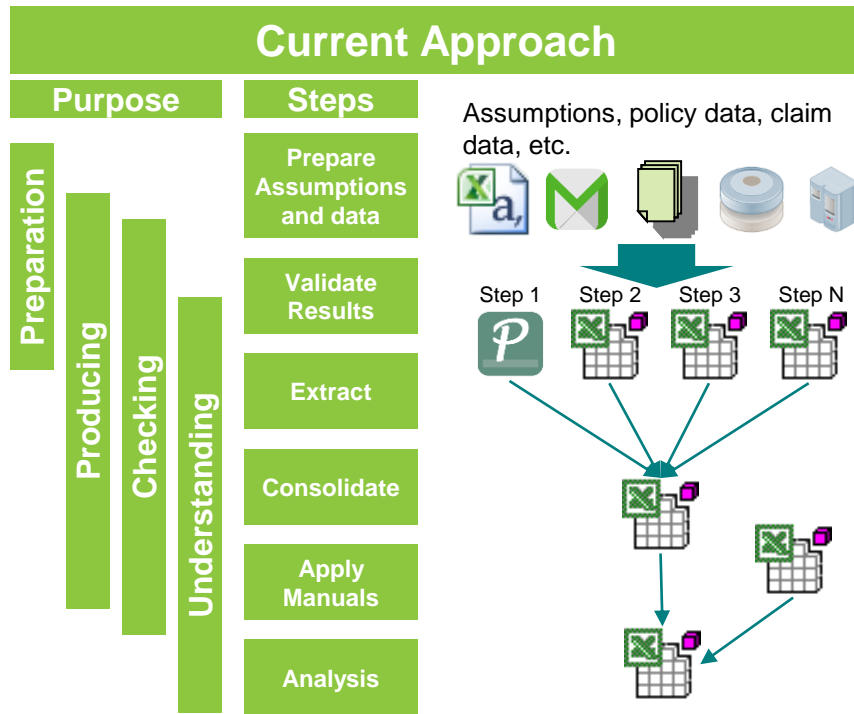
- **Common issues**

- Complicated legacy
- Manual-intensive
- Data issues impact on quality of analysis
- Inconsistent processes leading to duplication of effort

- **Objectives of the changes**

- Increased speed & flexibility of reporting
- Improved quality of controls & data
- Cost efficiency
- Increased Finance effectiveness and value added to business
- A positive working climate

Changing the Way We Work

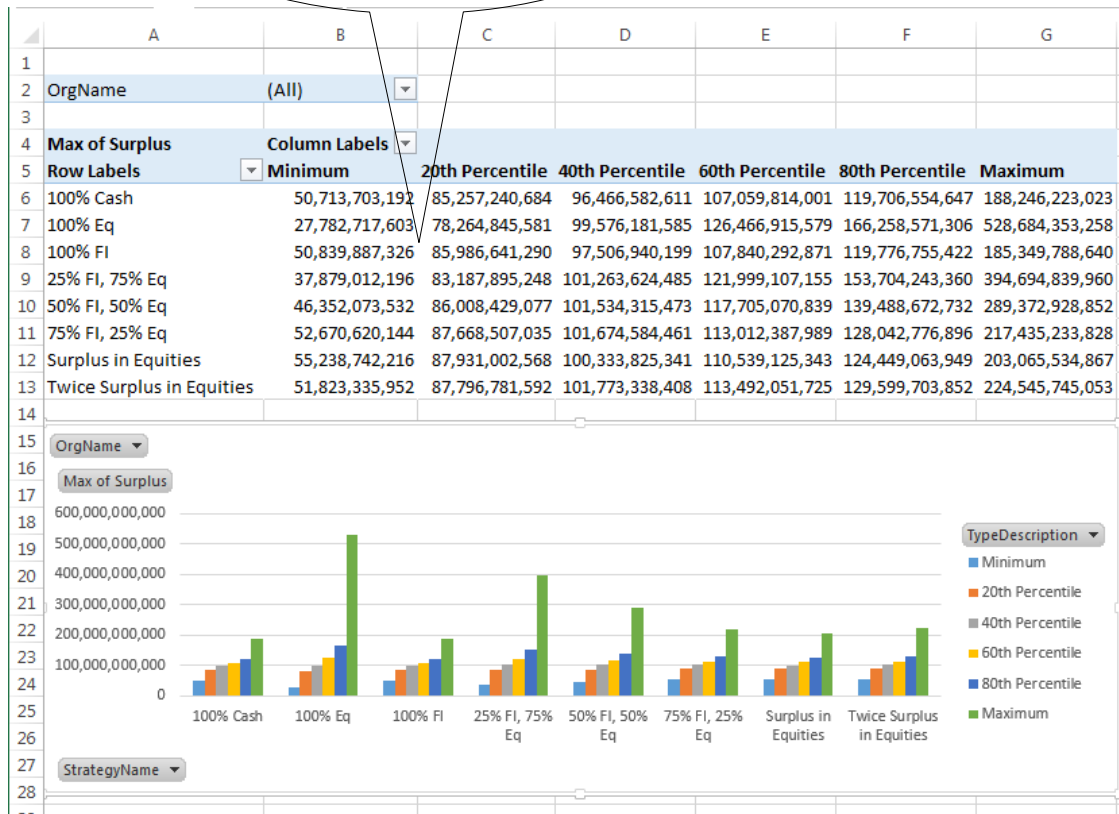


- Assumptions come in various way
- Manually process for assumption collection, analysis of changes, intensive, etc.
- Results constructed bottom up
- Data and results are hard to control
- Infrastructure not flexible to change requirement

- Assumptions managed centrally with proper access control, audit trail and approval process
- Automated production of change analysis and results
- Reduced reporting times
- Consistency across reporting measure and business area
- Enables top down focus on big ticket item

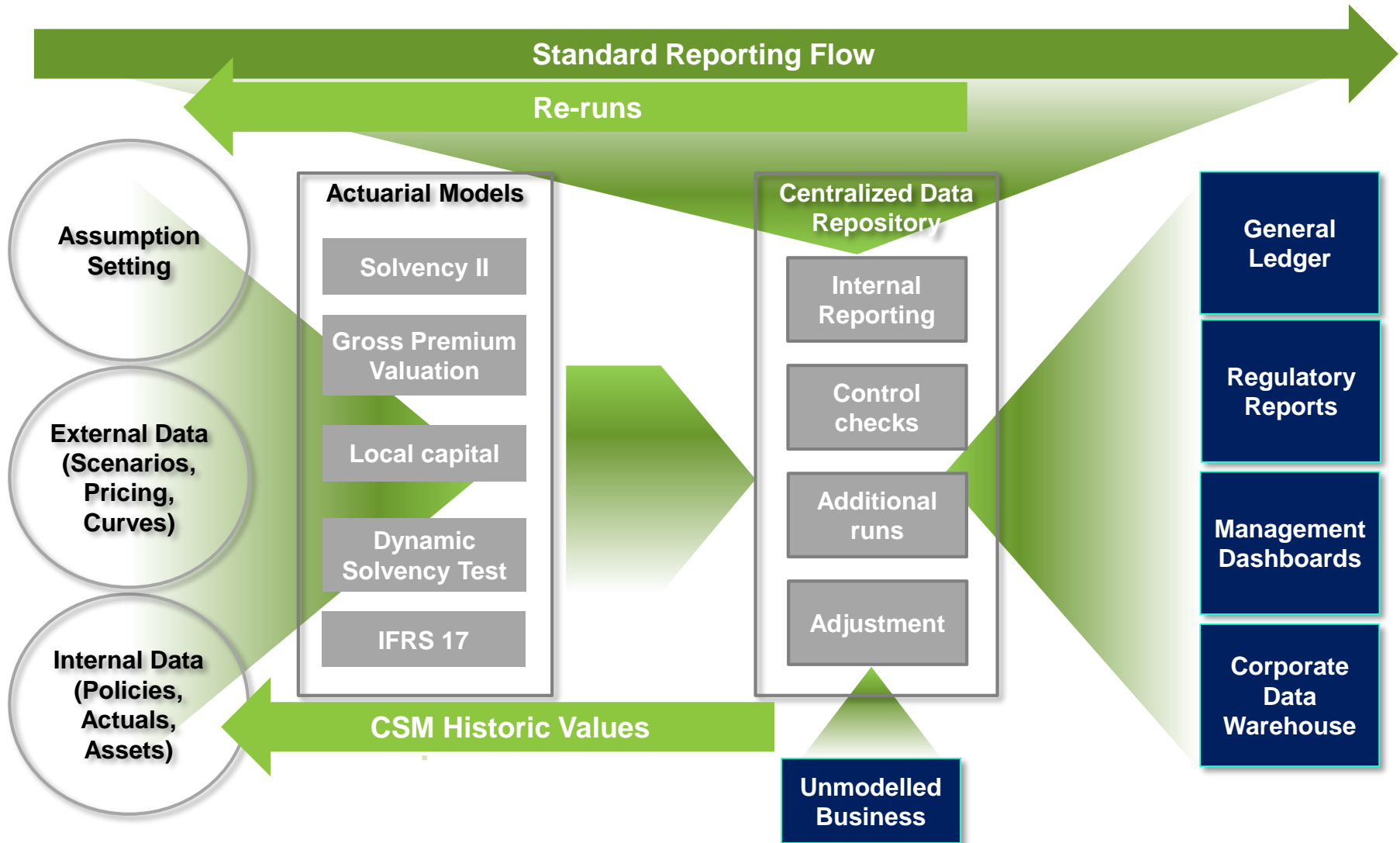
Centralized Data Repository: Adding Business Context to Data

Minimum Value of the 100% Fixed Income Strategy is 50.839M



- Convert the run number into a strategy name
- calculates the percentile values from the incoming data
- IDR can include simulation level data, or discard it, depending on the mapping file
- Data can be queried through SQL queries, and joined to provide slice and dice for pivot tables or pivot charts

The Effective Reporting Process



3. Governance and Control of Data Processing

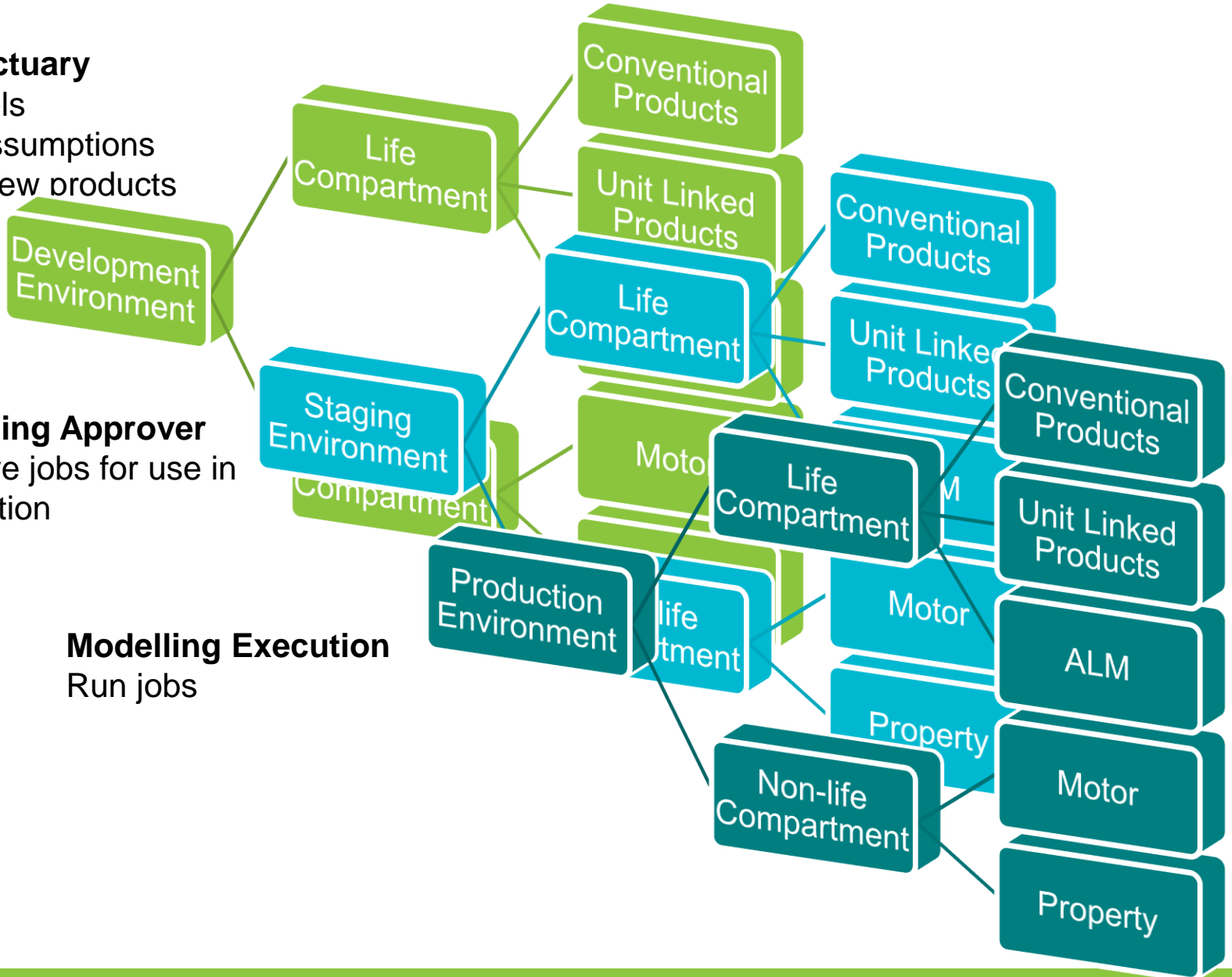
Why Governance?

- Results from Actuarial Modelling Tools will go to finance reports.
- Actuarial systems need to pass information across to accountancy systems and be able to explain changes in the accounts
- This process will be streamlined, governed and will need to move to “fast close”
- Internal approvers and external investors need confidence that the financial results are correct and disclosed in a timely manner

Environment Management

Modelling Actuary

Testing models
Examining assumptions
Developing new products



Modelling Approver

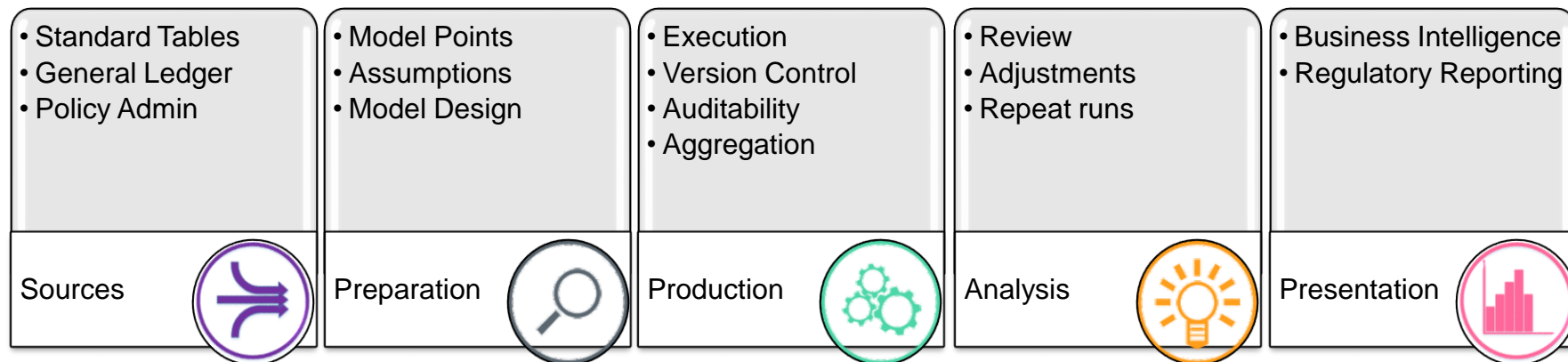
Approve jobs for use in production

Modelling Execution

Run jobs

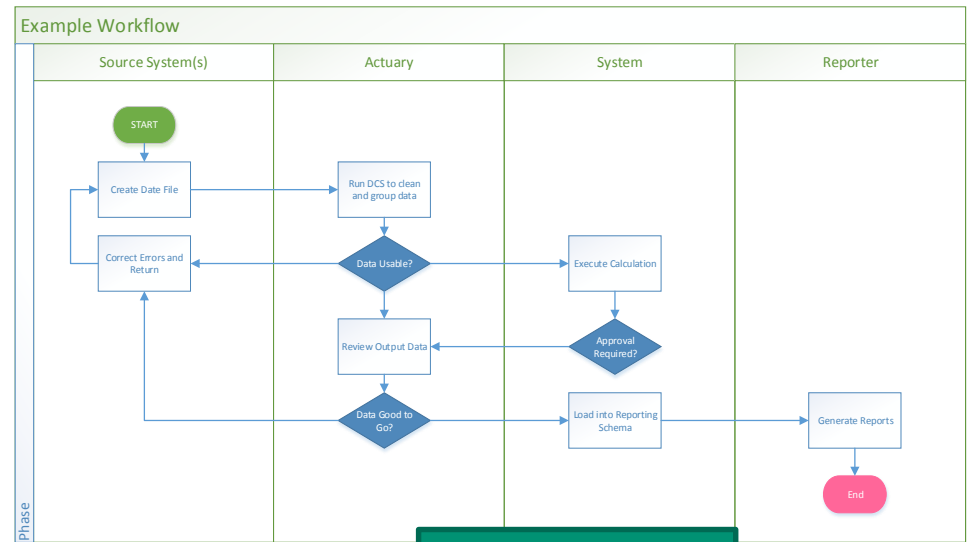
Process Steps

- The actuarial production follows a strict series of repeatable steps.
- Steps should be logged, reviewed, rejected, approved.
- Automation of the steps is possible
- Sparing time for real actuarial focus: Analysis and model design

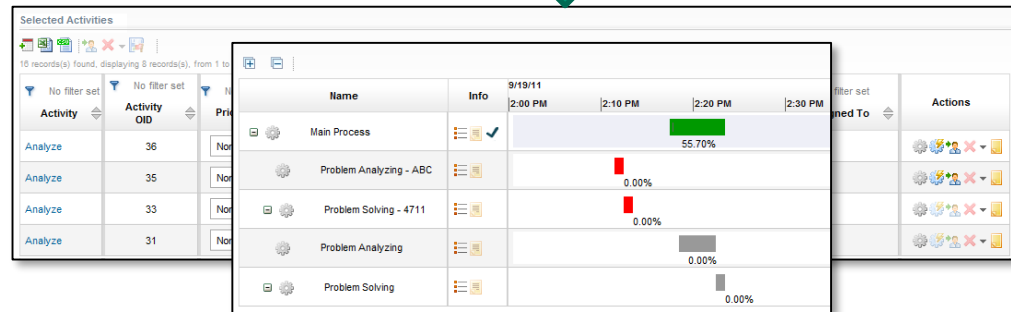


Workflow Systems

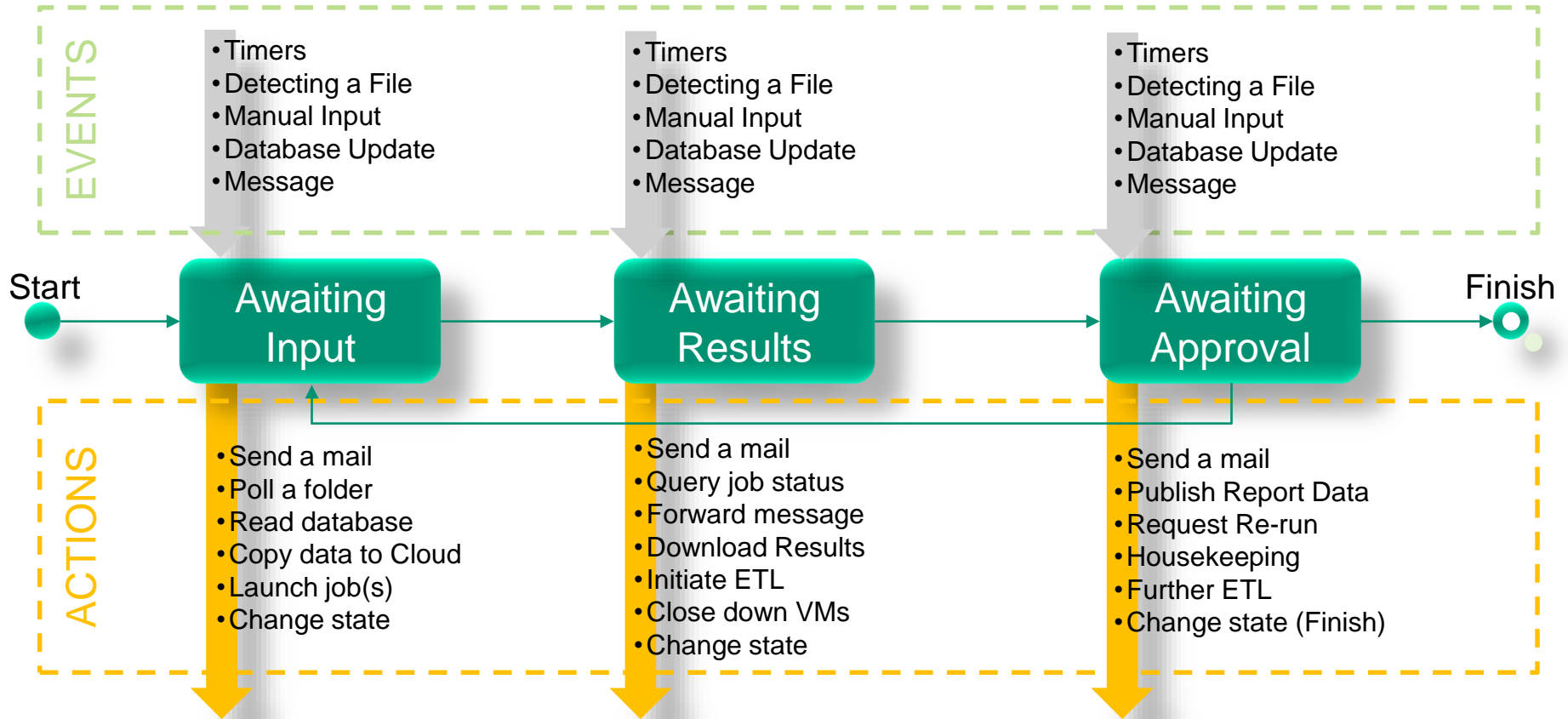
- Swim lane style diagrams can denote any business process, manual and/or automated
- The diagrams show how a business process interacts with other “actors”, e.g. different business roles or external systems
- Become Trackable trails



Turns Conceptual Process Diagrams into managed processes



What Can They Do?



- **The strength of a workflow system is in the flexibility of its modelling, and the range of events it can detect, and actions it can perform.**
- **The ability to intervene in workflows to correct errors and deal with exceptions is also crucial**

4. Ensure Business As Usual

On Premise VS. Cloud

Parameters	On Premise	Cloud Service
Compute Capacity	Provision for Peak (static Capacity)	Flexible Capacity, dial up and down as needed
Production Storage	High Cost (due to mirroring and backup)	Half the cost for Production Storage (Based on experience data)
Disaster Recovery	25 to 30% of infrastructure cost	Normally can be covered without additional cost (depends on infrastructure vendor)
Pricing	CapEx required and high fixed costs	Utility based pricing, No CapEx required
Usage	You always pay for 100% utilization	Pay for what you use
Support (for both infrastructure and software)	Need to invest in Actuarial software specialist, especially expensive if off-hours support required	Leverage vendor scale, normally apply 24x7 support model
Software Upgrades	Every 18-24 months budget for IT costs, higher if additional h/w refresh required	One Annual Upgrade included (depends on vendor)

3.

Introduction to FIS and Prophet



From banking to capital markets, retail to corporate

we bring greater efficiency, flexibility and scalability



20,000 financial institutions, no matter what size



27 billion transactions processed across the planet

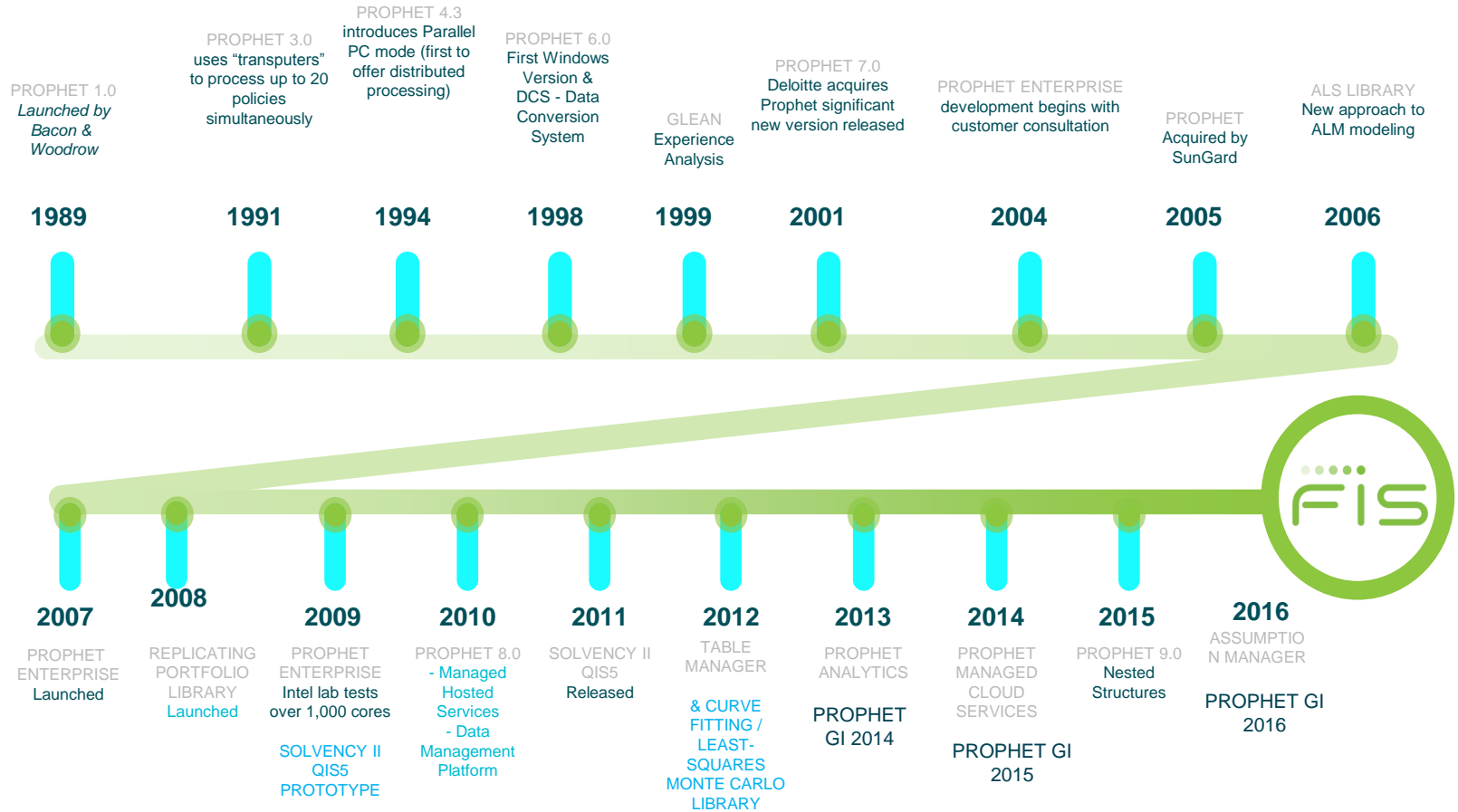


\$9 trillion to build storefronts and skyscrapers, homes and hospitals, careers and communities



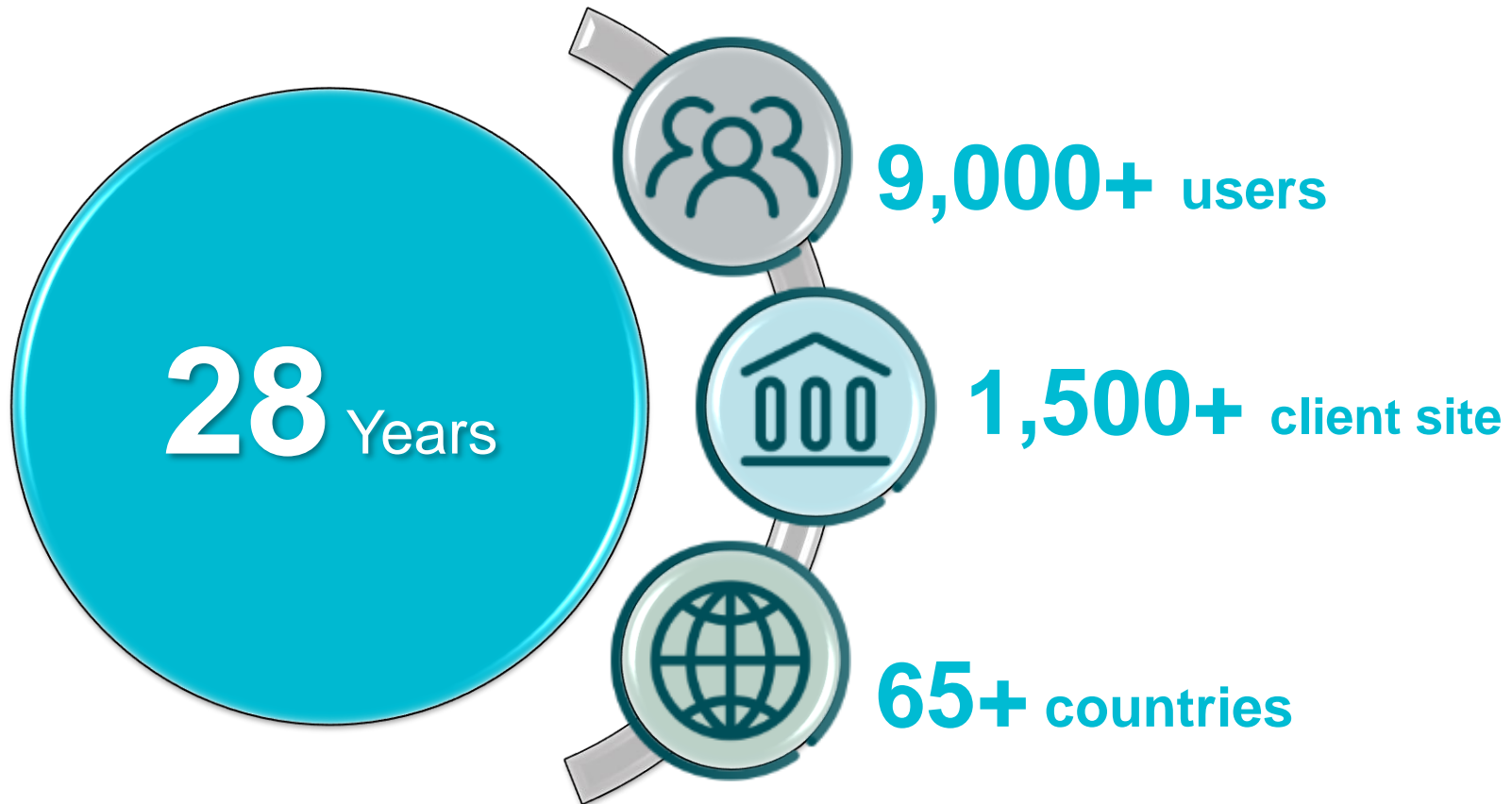
We do it with the minds, hearts and drive of 55,000 people in your corner

History of Prophet



Prophet's Global Footprint

Trusted by the insurance industry



26+ PROPHET Customers in Indonesia (life and non-life),
more than 50% market share

Our Global Acceptance

Chartis Research
Risktech 100

2016

Winner in The Insurance Vertical Category

Chartis Research
Risktech 100

Winner in The Insurance Vertical Category



Insurance Risk Awards
Winner

2015

Best Data Management Service Provider

Insurance Risk Awards
Winner

2016

Best actuarial modelling software

Insurance Risk Awards
Winner

2015

Best Actuarial Modelling Software

Chartis Research
Risktech 100

2014

Winner in The Insurance Vertical Category

Chartis Research
**Solvency II
Technology**

2014

Category Leader

Insurance Risk Awards
Winner

2013

Best Actuarial Modelling Software

CEB Tower Group
**Actuarial Systems
Product Rankings**

2012

Best In Class

Life And Pensions
Risk Awards

2011

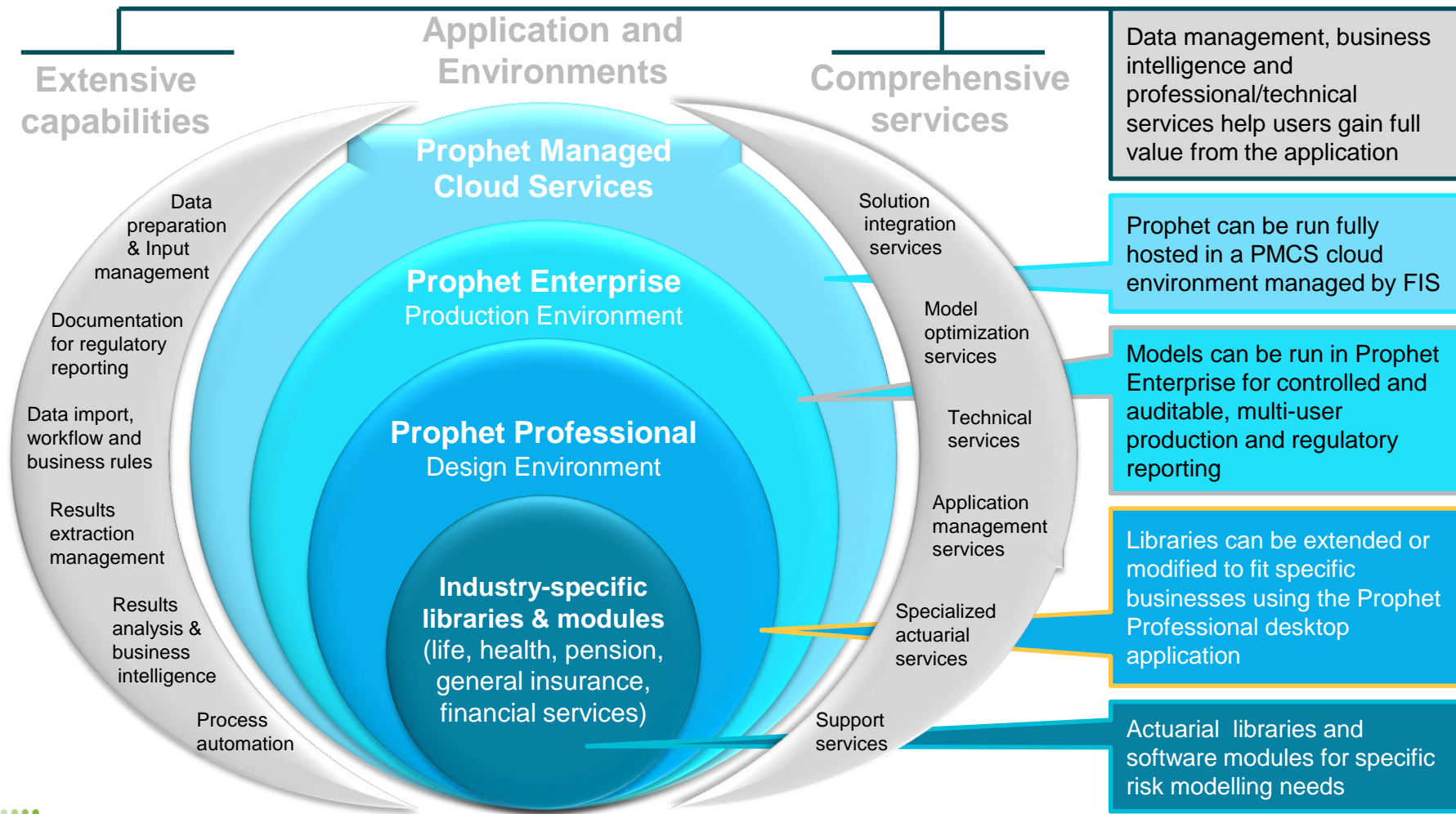
Best Actuarial Modelling Solution

Prophet's Market Acceptance



FIS Insurance: The Prophet Solutions

FIS provides a range of functional capabilities and services that span all application environments.



Strengths of Prophet

Performance

- Prophet has **Proven outstanding performance** and has been used successfully by many largest companies in the world
- Prophet is **very robust and stable with reflecting user's demand**
- Prophet **shortens your production time**

Benefit of an integrated system

- **Reliability:** Your company is dealing with one single system which has **been fully tested by so many users over so many years**
- **Consistency:** With a single system you are working on a consistent basis across the whole portfolio and across the various actuarial modelling needs. No reconciliation issue, for example, between the model used for valuation and for projection
- Staff turnover: **Most actuarial staff is familiar with the system** and the system is used for most tasks of the actuarial department, over-dependence on key staff becomes less of an issue
- **Efficiency:** An integrated system eliminates the duplication of efforts

Professionally supported

- We are constantly striving to offer the **best support**
- Our staff have **deep understanding** of the system
- Our staff have **numerous experience** in implementation assistance and training
- **Helpdesk support via online portal, email and phone**

Open to all companies

- **Prophet is open to all companies including all actuarial consulting firms**
- You do not have to be bound to use the vendor for implementation assistance (a monopoly so they could control the price)
- **You are choose any service provider you want** – so more competitions and better for users!

Owned by FIS

- Renowned specialist IT firm with specialist software packages for financial services industries
- **Excellent strategic relationship with famous big IT names like Microsoft, Intel, etc.**
- Our core business is to make software so you can be sure that **we have all the expertise to continue to develop our software to meet for more and more challenging future demands**

Prophet Solutions for Various Need of Actuarial Systems

Governance and Connectivity

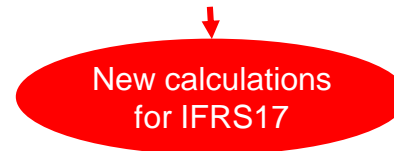
Calculations

Core

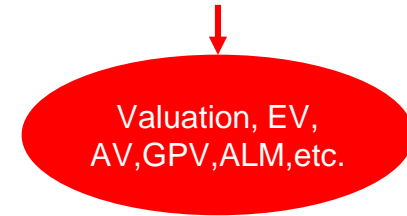
Assumptions Manager



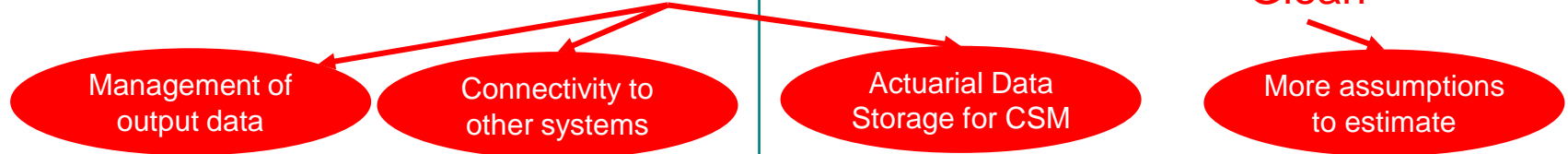
Library Updates



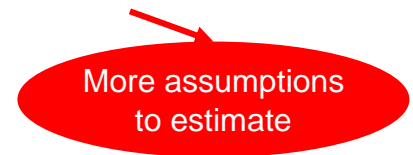
Prophet Professional



Insurance Data Repository

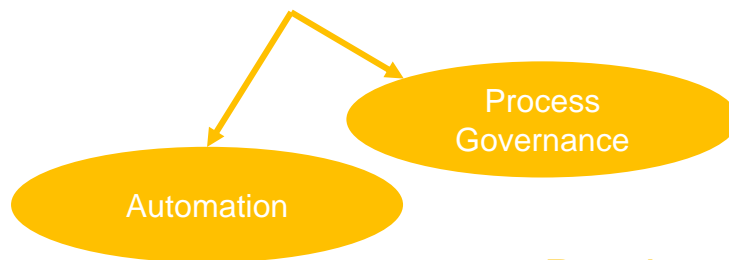


Glean



Advanced

Process Controller

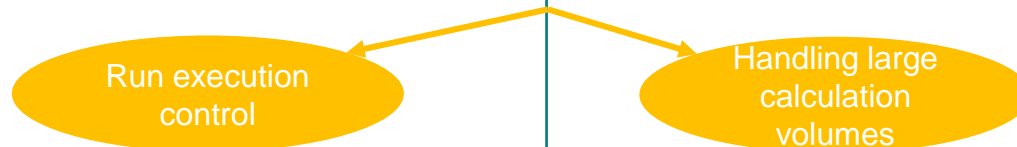


Nested Structures



Library Updates

Prophet Enterprise



Prophet IFRS 17 Solutions

Glean

- Experience analysis for assumption setting
- data mining tool for risk factor analysis

Assumptions Manager

- Controls and auditability of assumptions
- Automatable sensitivity testing and analysis of change

Nested Structures

- Allows embedding of models within one another
- Stochastic on stochastic

Prophet Enterprise

- Production platform for Prophet runs
-
- Inputs and output are “locked down”
- Reproducible results

Prophet Results Database & Insurance Data Repository

- Transform actuarial data into consumable format
- Governance framework to ensure data security traceability

Prophet Control Center

- Documentation and automation of the end to end process
- A full history of each business process, with electronic approvals

All of our solutions can be installed on premise or in a public or private cloud using our managed cloud services

Question and Answers

Empowering
the Financial World

