

Actuary of the Future

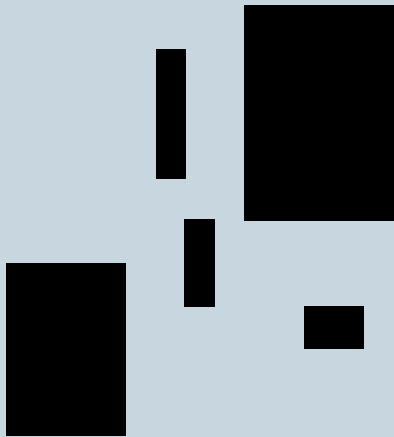
CAS Spring Meeting

Day Bishop, Noelle Codispoti, Joe Milicia, Dave Snow

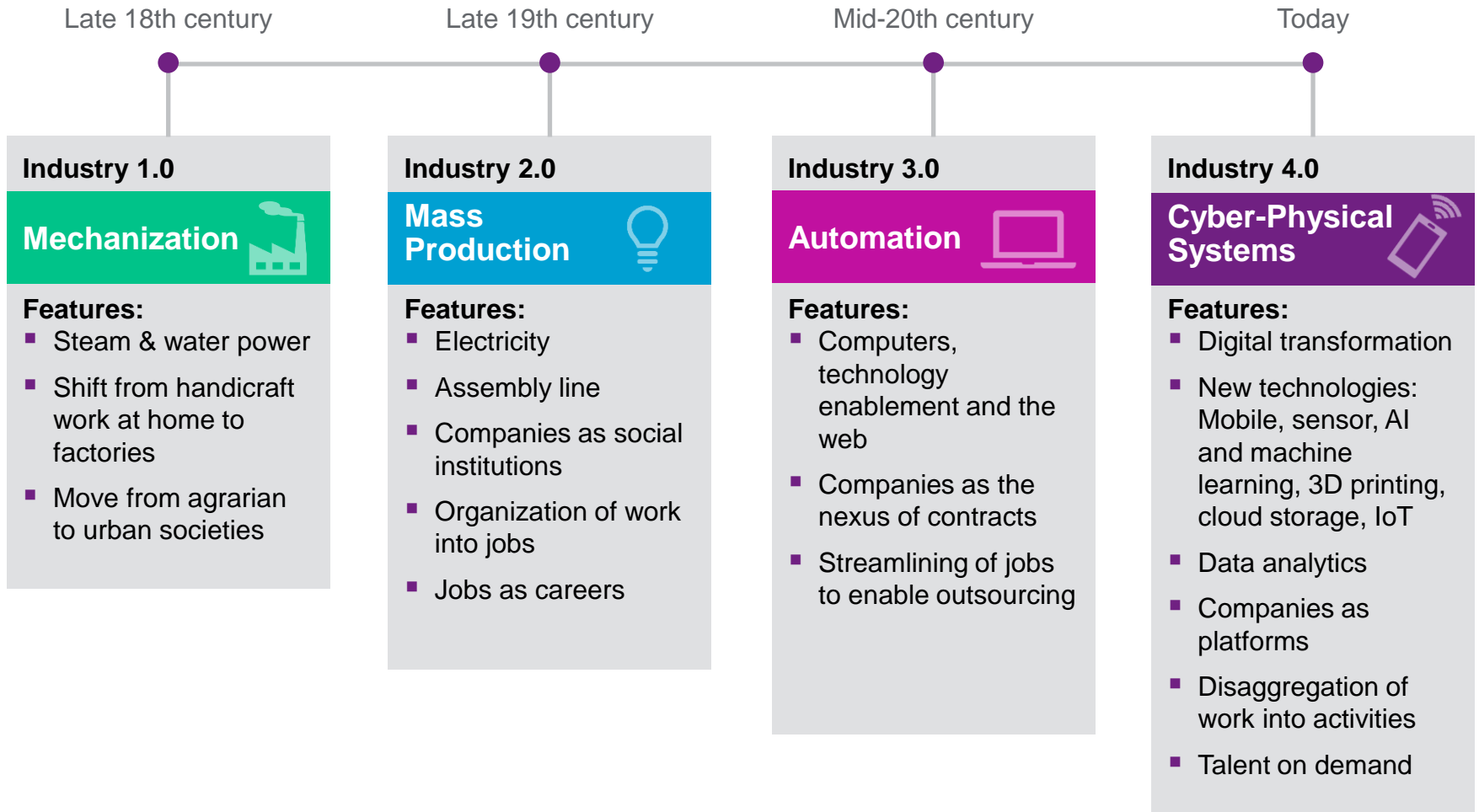
May 20, 2019



Where we are today



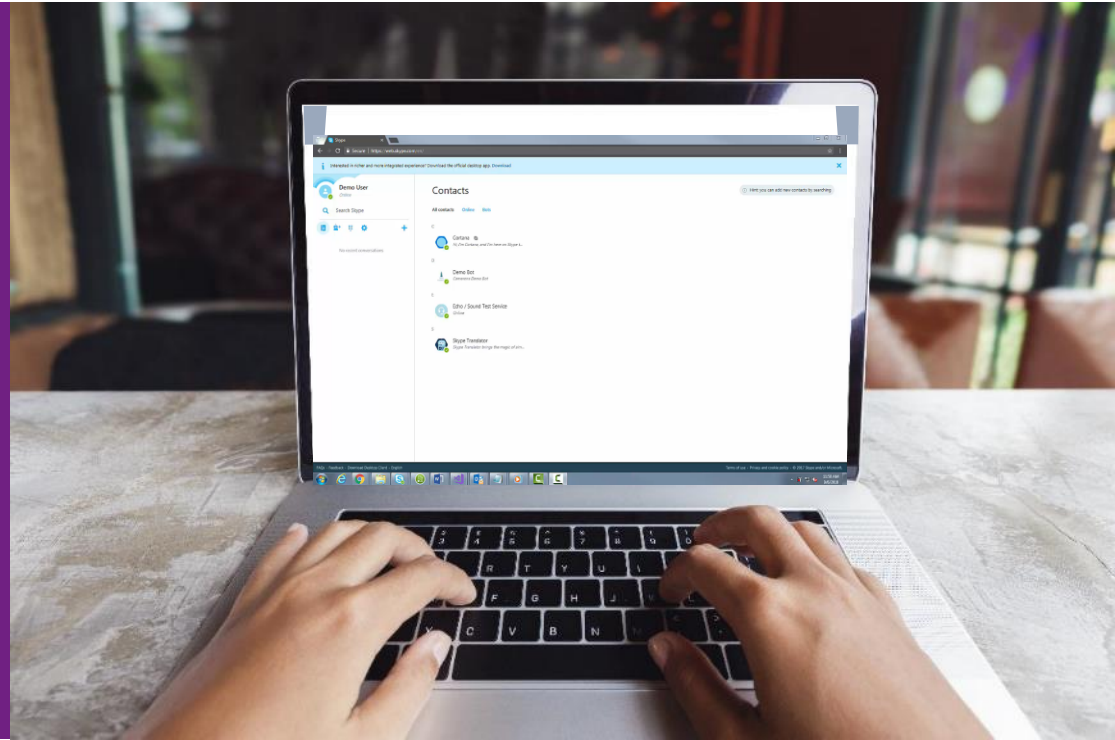
Industry 4.0 is changing how we live, work & communicate



Source: Willis Towers Watson

We live in a 24/7 world where Customer Experience is the product

Amazon and Google
have changed
our expectations



Polling question #1

How much change do you see happening in your organization today?

A) Not feeling it

B) We're just starting to explore new technologies

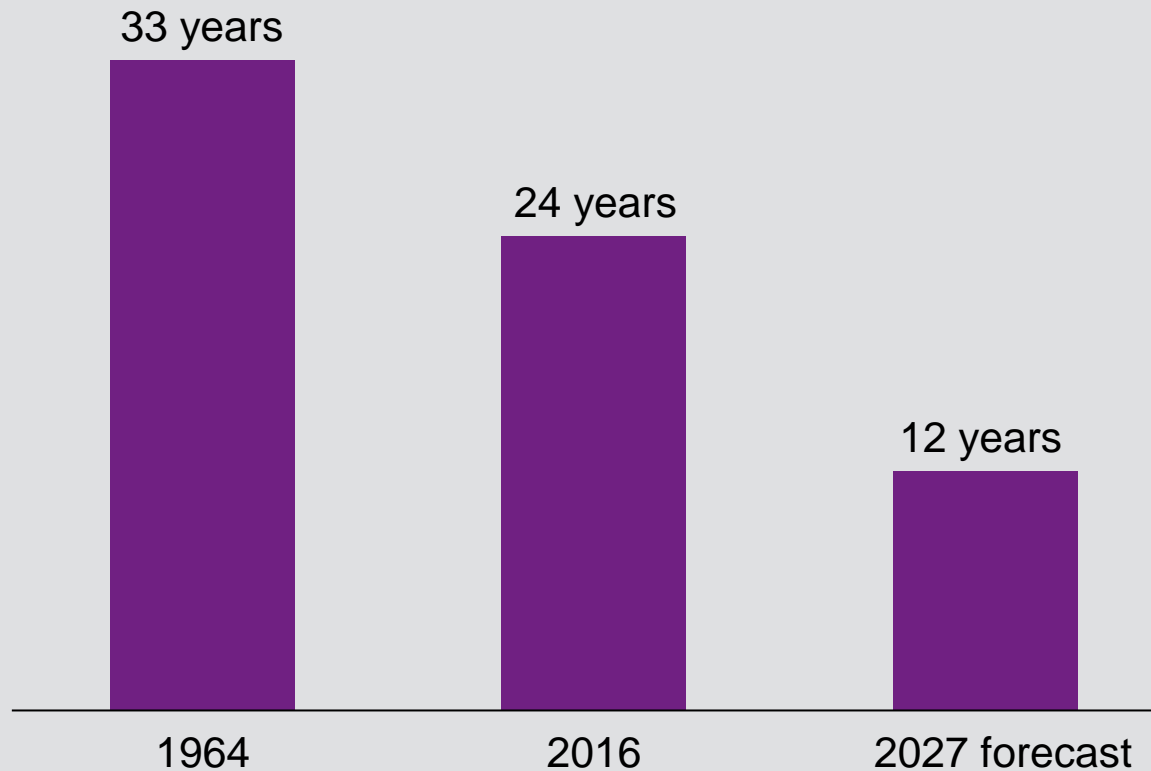
C) Feels like we're trying something new every day



But we've been
an industry leader
since 1828.

Company lifespans are getting shorter

Average Tenure of Companies on the S&P 500



Source: Innosight

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Polling question #1

How much change do you see happening in your organization today?

A) Not feeling it

B) We're just starting to explore new technologies

C) Feels like we're trying something new every day

How insurers are using technology



Change drivers

Market Pressure
Competition and economic environment

Organizational Goals

Profitable  **Sustainable**


Regulatory Pressure
Customer, Capital and accounting standards

Finance, Risk and Actuarial Goals

Internal Reporting



The need for faster Management Information for timely decisions

 **Real Time Management Information**

Reporting time line constraints and convergence

Better quality Management Information for business steering

 **More Effective**

More granular regulatory and accounting standards

Give more back to the business with less

 **More Efficient**

Cover more regulation with less

External Reporting



Operating model constraints

Operating models can be constrained by:

- **People**
Skills and knowledge for certain tasks
- **Process**
Locked into fulfilling historic requirements
- **Technology**
Point solutions and siloes
- **Data**
Disparate and redundant

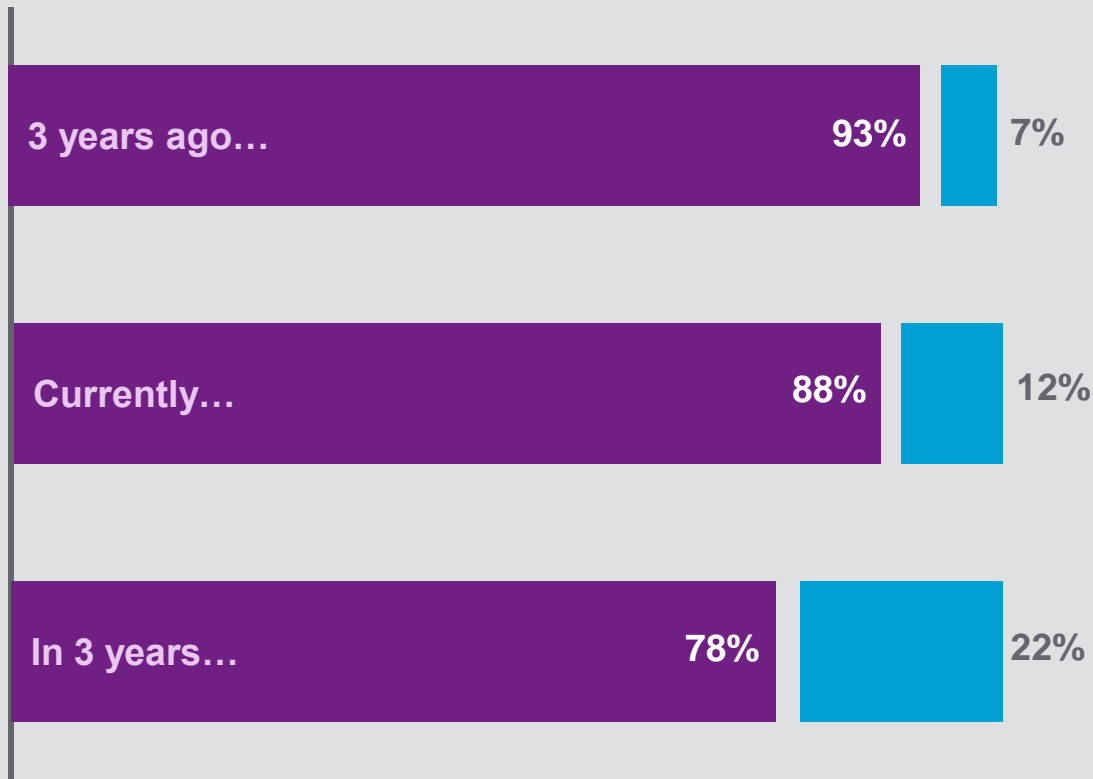
Overcome constraints by:

- Understanding what need or demand you are servicing and build to that
- Be process led and technology enabled
- Breaking with custom and practice

Use of automation will continue to expand

Expected to nearly double over the next three years

■ Humans ■ Automation

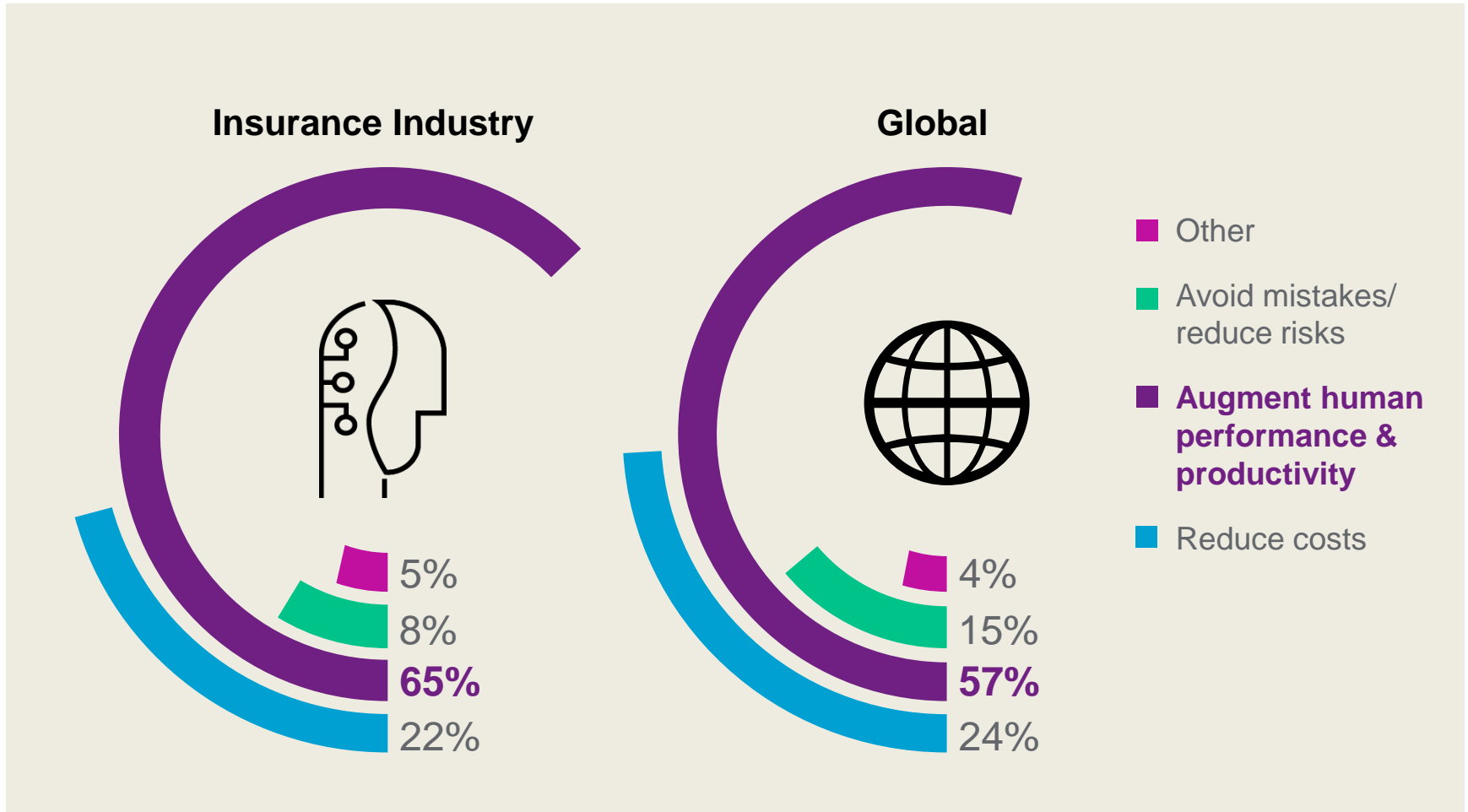


Source: December 2017 Willis Towers Watson FOW Global Survey

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Automation Augments Human Capability



Source: December 2017 Willis Towers Watson FOW Global Survey, Insurance

Note: Percentages may not add up to 100% due to rounding

Polling question #2

Where would you like to see technology take on a bigger supporting role?

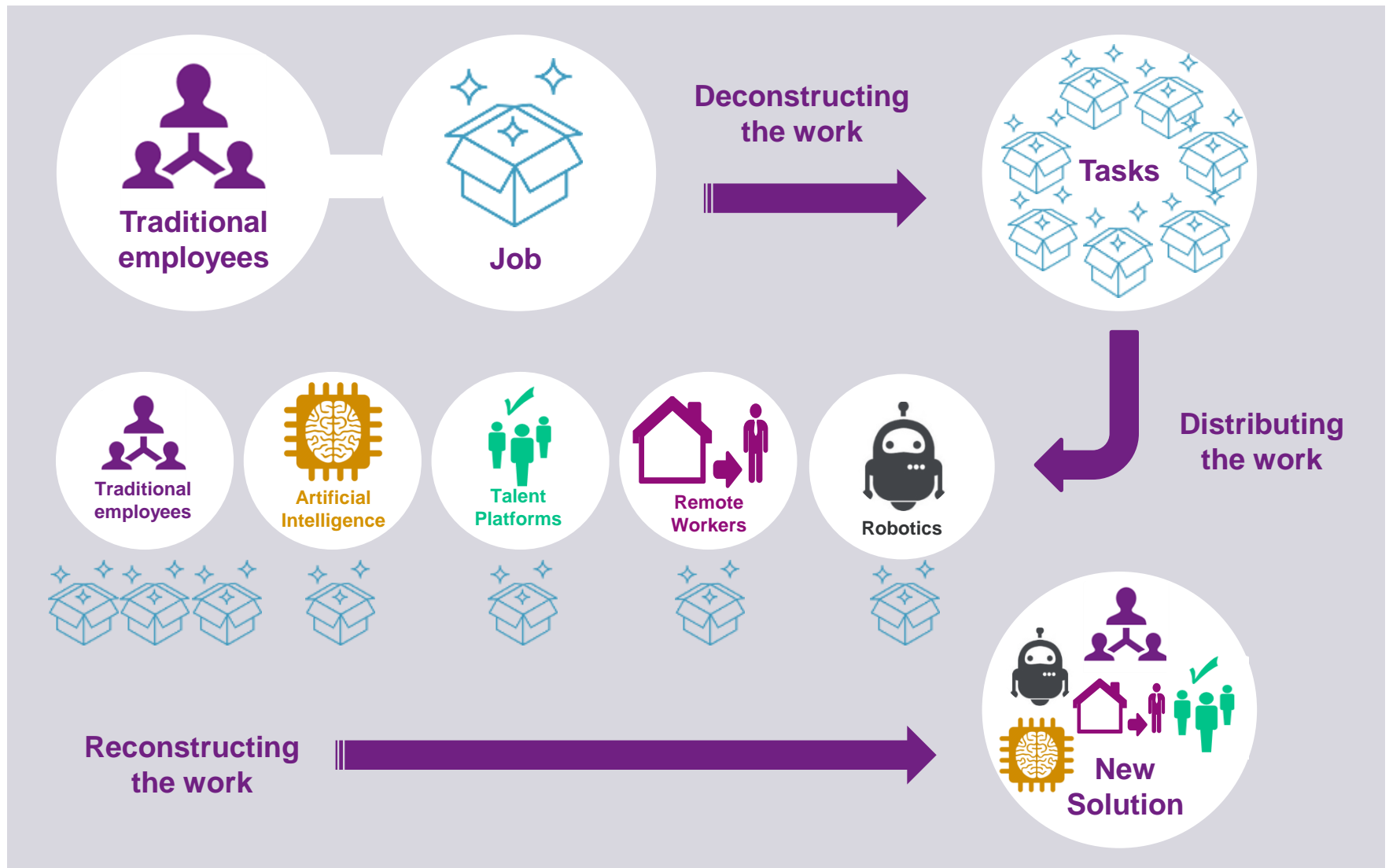
A) Financial reporting

B) Reserving

C) Pricing

D) Risk management

More options for getting work done

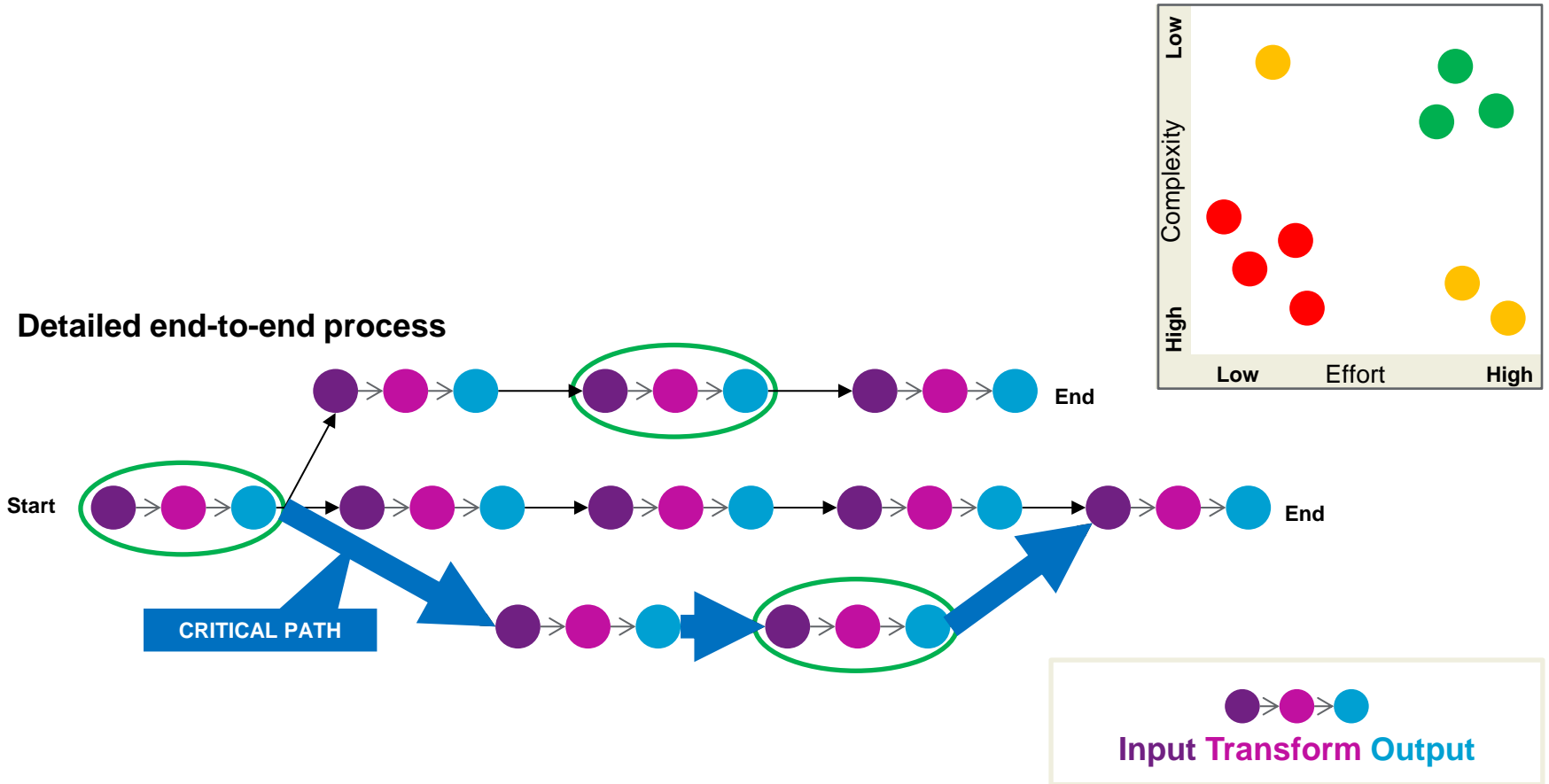


Analyze and deconstruct

Classify each activity on the following continuums



Deciding which options are right...



Automation changes everything

Should I offshore or automate?

How can an actuary benefit from automation – do I need to be a programmer or IT expert?

What's the right RPA choice for me?

Are insurance specific technologies a barrier to automation?

Will automated processes still satisfy my auditors?

What are the true pain points?

Will the robots replace me and my staff?

How do I ensure that I still control the process and comply with regulators' demands?

How do I ensure I don't create the inefficient process of the future?

Polling question #2

Where would you like to see technology take on a bigger supporting role?

A) Financial reporting

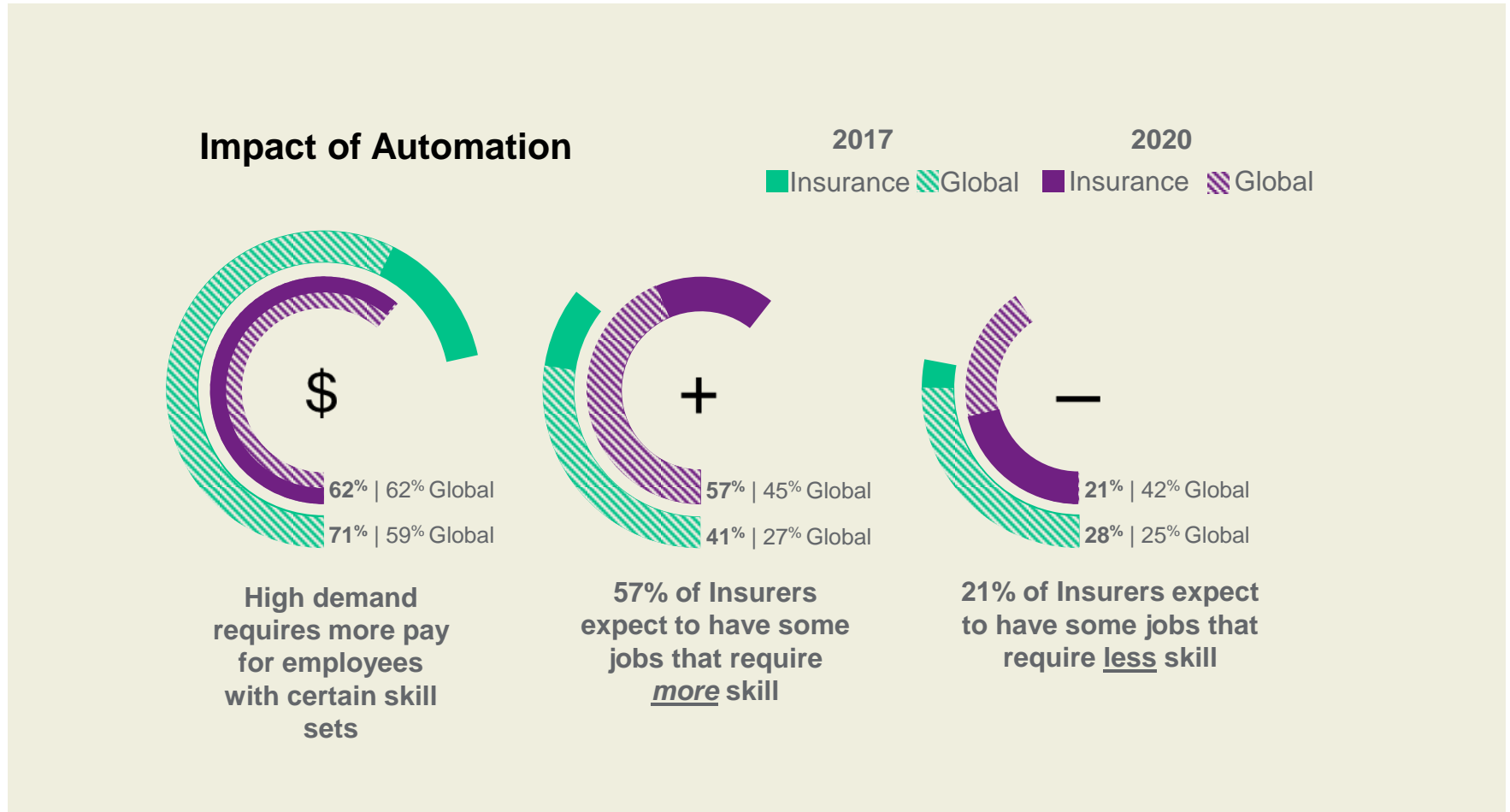
B) Reserving

C) Pricing

D) Risk management

New roles

As certain tasks are automated, new types of work and skills will be required



Source: December 2017 Willis Towers Watson FOW Global Survey, Insurance

Actuary of the Future



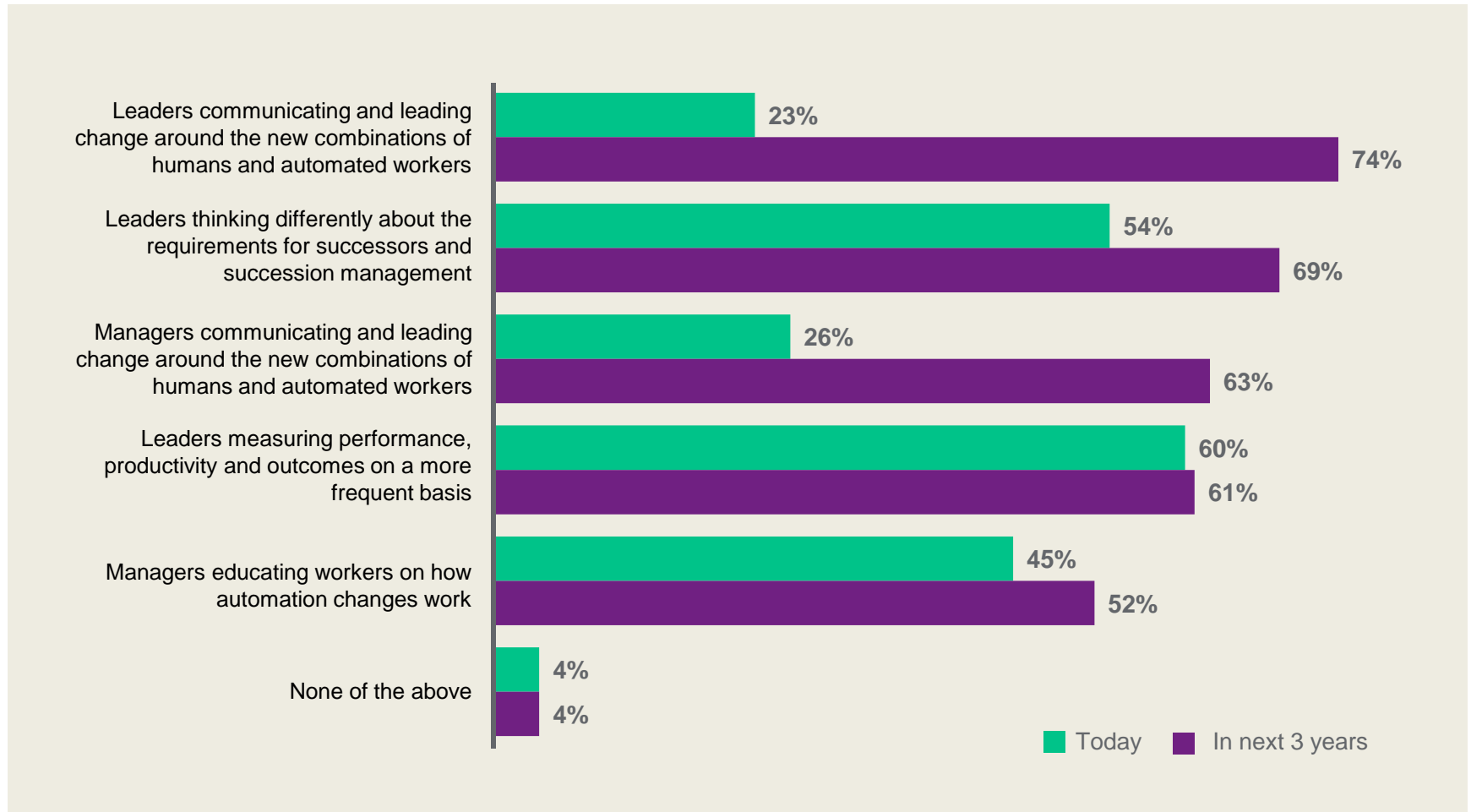
Top 10 skills that will be in demand by all employers by 2020



- 10 Cognitive flexibility
- 9 Negotiation skills
- 8 Service orientation skills
- 7 Judgment and decision making
- 6 Emotional intelligence
- 5 Coordinating with others
- 4 People management
- 3 Creativity
- 2 Critical thinking
- 1 Complex problem solving

Source: Future of Jobs Survey, World Economic Forum, January 2016

Leaders and managers have a critical role to play



Source: December 2017 Willis Towers Watson FOW Global Survey, Insurance

Recruiting Trends



49%
Job Seekers beginning search virtually

19%
Secured position through virtual process



Source: Gamma Iota Sigma Recruiting Survey 2018

Role of the Data Scientist

Data Science	Actuary	Data Analyst
Macro	Micro	Micro
Ask Questions	Find actionable data	Find actionable data
Use Big Data	Use Big Data	Use Big Data
C++, Python, NoSQL	Excel, VBA, SQL	Data Visualization
Various Industries	Insurance	Various Industries

Employees have changing expectations



Employers are investing renewed energy into Inclusion & Diversity

...as well as talent management processes and, of course, pay

71%

Global companies with processes to remove bias on hiring



41%

North American companies say gender pay equality is becoming more important in base pay decisions (UK 58%, EMEA 39%)



56%

Global companies with processes in place to remove bias on promotion



Source: WTW 2018 Getting Compensation Right Global Pulse Survey 2018



Polling question #3

What are you looking forward to most as an actuary in the future?

- A) Leveraging technology so I can focus on more interesting aspects of work
- B) Flexible working arrangements
- C) Opportunities to continually learn

A Day in the Life...



The future is now...



A typical day in the near future

July 2019						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

A typical day in the near future



A typical day in the near future



Your daily dashboard

The screenshot shows an Outlook email window. The title bar reads "Premium and claim data checks complete - Message (HTML)". The ribbon includes "File", "Message", "CIS Add-In", and "ADOBE PDF". The ribbon contains various action buttons such as "Ignore", "Delete", "Archive", "Reply", "Reply All", "Forward", "Protect", "Quick Steps", "Move", "Mark Unread", "Categorize", "Follow Up", "Translate", and "Zoom".

The email content is as follows:

Fri 4/19/2019 5:04 PM
Unify@willistowerswatson.com
Premium and claim data checks complete
To: Milicia, Joseph (Philadelphia)

Movement_Checks_Claims_Data_Checks_20190419_170303.pdf 70 KB	Static_Checks_Claims_Data_Checks_20190419_170303.pdf 66 KB
Movement_Checks_Premium_Checks_20190419_170306.pdf 66 KB	Static_Checks_Premium_Checks_20190419_170306.pdf 65 KB

Job: [Data Validation Job](#)

The premium and data reconciliations are complete. Please review the attached reports. The data will now be imported into ResQ.

Your daily dashboard

DataValidator - Movement Checks Report Claims_Data_Checks 4/19/2019 5:03:03 PM

1 Report Summary

Project Name	Claims_Data_Checks
Submitted	4/19/2019 9:03:03 PM UTC
Submitted By	INTERNAL\svsAzUnifyCE
Input Data File	G:\ExecutionAgents\Jobs\60511.5\6\Process_Claims_Data\
Premium Lookup	G:\ExecutionAgents\Jobs\60511.5\6\Process_Premium_Data\
Individual Reference Data File	\\internal\rcsc-nat\practice\PCIUNIFY\100_Marketing_Material_Database\E2E_Reserve_Process\Data_2017Q2\Claims\Cla
Aggregate Reference Data File	G:\ExecutionAgents\Jobs\60511.4\7\Process_Claims_Data\A
Individual Checks Overall Pass Rate	99.9%
Individual Checks Average Pass Rate	99.9%
Aggregate Checks Overall Pass Rate	73.3%
Aggregate Checks Average Pass Rate	78.8%

2 Individual Data Results

2.1 Summary

Overall Pass Rate	99.9%
Average Pass Rate	99.9%
Current extract contains 6427 records	
Reference extract contains 5620 records	
3379 records uniquely matched in both extracts were checked	
461 new records in the current extract (representing 7.2% of the current extract) were not checked	
0 missing records in the Reference extract (representing 0% of the reference extract) were not checked	
0 excluded records in the current extract (representing 0% of the current extract) were not checked	
2587 records in the Current extract (representing 40.3% of the current extract) were not checked	
2241 records in the Reference extract (representing 66.3% of the reference extract) were not checked	

2.2 New Records

Description	Count
New Records	461

2.3 Missing Records

Description	Count
Missing Records	0

2.4 Movement Checks

Re fid	Description	Comments	Materiality	Failure Count	PassRate
1	Paid has a percentage movement in the range -0.01% to 0.01%	Checks the paid is the same as comparison data	Medium	2	99.9%
2	Outstanding has a percentage movement in the range -0.01% to 0.01%	Checks the outstanding is the same as comparison data	Medium	2	99.9%
3	Incurred has a percentage movement in the range -0.01% to 0.01%	Checks the incurred is the same as comparison data	Medium	3	99.9%

3 Aggregate Data Results

3.1 Summary

Overall Pass Rate	73.3%
Average Pass Rate	78.8%
Current extract contains 190 records	
Reference extract contains 184 records	
184 records uniquely matched in both extracts were checked	
6 new records in the current extract (representing 3.2% of the current extract) were not checked	
0 missing records in the Reference extract (representing 0% of the reference extract) were not checked	
0 excluded records in the current extract (representing 0% of the current extract) were not checked	
0 records in the Reference extract (representing 0% of the reference extract) were not checked due to duplicate issues	

3.2 New Records

Description	Count
New Records	6

3.3 Missing Records

Description	Count
Missing Records	0

3.4 Movement Checks

Re fid	Description	Comments	Materiality	Failure Count	PassRate
1	Paid_Sum has a percentage movement in the range 0% to 20%	Checks the total paid movement by UWY and class is no greater than 20%	Medium	42	77.1%
2	Outstanding_Sum has a percentage movement in the range 0% to 20%	Checks the total outstanding movement by UWY and class is no greater than 20%	Medium	34	81.5%

Your daily dashboard

The screenshot displays the Outlook interface for an email titled "Reserve Summary - Message (HTML)". The ribbon includes "File", "Message", "CIS Add-In", and "ADOBE PDF". The "Message" ribbon is active, showing various actions like "Delete", "Archive", "Reply", "Forward", "Protect", "Quick Steps", "Move", "Mark Unread", "Categorize", "Follow Up", "Translate", and "Zoom".

The email content shows a message from "Unify@willistowerswatson.com" dated "Fri 4/19/2019 5:06 PM". The subject is "Reserve Summary". The recipient is "Milicia, Joseph (Philadelphia)". An attachment is visible: "Reserve_Summary.xlsx" (344 KB).

Below the attachment, there is an "Action Items" section with a "+ Get more add-ins" link. The main body of the email contains the following text:

Job: [Reserve Summary Update Job](#)

Please review the reserve summary attached.

Your daily dashboard

Reserve_Summary (003).xlsx [Read-Only] - Excel

File Home Insert Draw Page Layout Formulas Data Review View Add-ins Font PDF ACROBAT Tell me what you want to do

Underwriting year	Earned Premium	Paid claims	Outstanding claims	Incurred claims	IBNR	Ultimate claims 2017 Q4	Claim reserves	Ultimate loss ratio	Ultimate Claims 2017 Q2	FX Impact	Ultimate Claims 2017 Q2 (FX adjusted)	Difference (excl. FX impact)	% Difference
2011	1,154	598	398	897	-	897	398	85%	897	-	897	-	-
2012	10,448	8,420	3,837	12,257	-	12,257	3,837	117%	12,257	-	12,257	-	-
2013	18,177	24,020	10,237	34,257	-	34,257	10,237	188%	34,257	-	34,257	-	-
2014	20,348	-	-	-	-	-	-	-	-	-	-	-	-
2015	20,873	-	-	-	-	-	-	-	-	-	-	-	-
2016	20,103	-	-	-	-	-	-	-	-	-	-	-	-
2017	17,156	-	-	-	-	-	-	-	-	-	-	-	-
Total	108,280												

Reserve_Summary (003).xlsx [Read-Only] - Excel

File Home Insert Draw Page Layout Formulas Data Review View Add-ins Font PDF ACROBAT Tell me what you want to do

Underwriting year	Earned Premium	Paid claims	Outstanding claims	Incurred claims	IBNR	Ultimate claims 2017 Q4	Claim reserves	Ultimate loss ratio	Ultimate Claims 2017 Q2	FX Impact	Ultimate Claims 2017 Q2 (FX adjusted)	Difference (excl. FX impact)	% Difference
2011	255	-	-	-	-	-	-	-	-	-	-	-	-
2012	4,482	-	-	-	-	-	-	-	-	-	-	-	-
2013	7,440	-	-	-	-	-	-	-	-	-	-	-	-
2014	7,948	-	-	-	-	-	-	-	-	-	-	-	-
2015	8,750	-	-	-	-	-	-	-	-	-	-	-	-
2016	8,033	-	-	-	-	-	-	-	-	-	-	-	-
2017	4,408	-	-	-	-	-	-	-	-	-	-	-	-
Total	37,325												

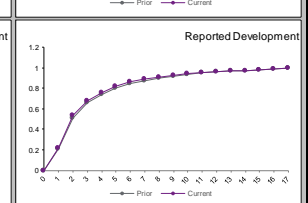
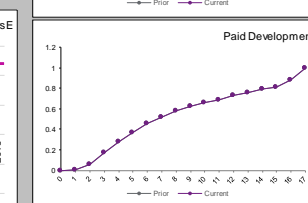
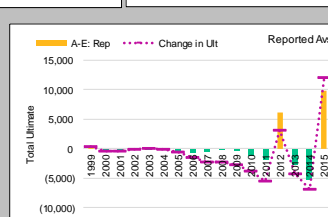
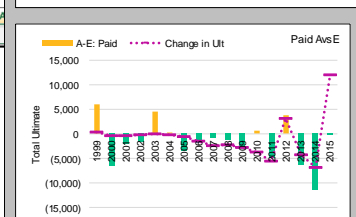
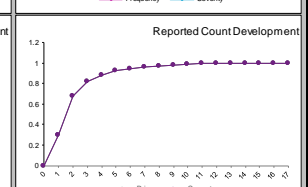
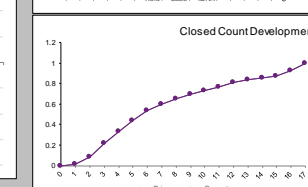
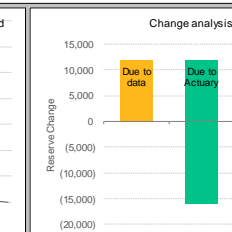
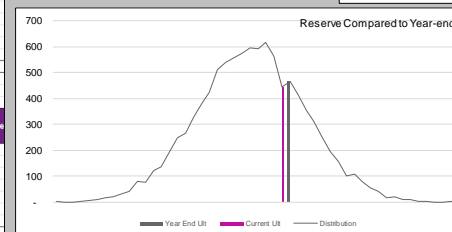
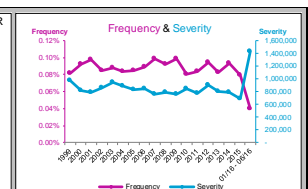
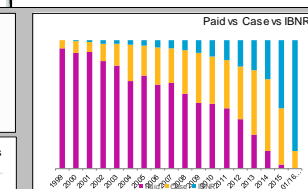
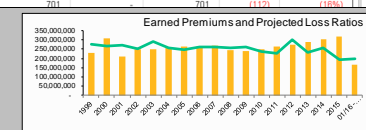
Underwriting year	Earned Premium	Paid claims	Outstanding claims	Incurred claims	IBNR	Ultimate claims 2017 Q4	Claim reserves	Ultimate loss ratio	Ultimate Claims 2017 Q2	FX Impact	Ultimate Claims 2017 Q2 (FX adjusted)	Difference (excl. FX impact)	% Difference
2011	899	-	-	-	-	-	-	-	-	-	-	-	-
2012	5,856	-	-	-	-	-	-	-	-	-	-	-	-
2013	10,737	-	-	-	-	-	-	-	-	-	-	-	-
2014	12,401	-	-	-	-	-	-	-	-	-	-	-	-
2015	14,122	-	-	-	-	-	-	-	-	-	-	-	-
2016	14,089	-	-	-	-	-	-	-	-	-	-	-	-
2017	12,750	-	-	-	-	-	-	-	-	-	-	-	-
Total	70,834												

Summary of methodology

Underwriting year	Incurred to-date	Incurred chain loader factor	IELR	Inc chain utl
2011	-	1.00	-	-
2012	60	1.00	16%	-
2013	533	1.00	43%	-
2014	714	1.00	39%	-
2015	2,413	1.02	40%	-
2016	452	1.30	40%	-
2017	1,558	4.87	40%	-
Total	6,729			

Company: ABC
 Coverage: Commercial/Umbrella
 Current Eval: 6/30/2016
 Prior Eval: 12/31/2015

Projected Loss Ratios
 For 2015: 54.7%
 For 01/16 - 06/16: 57.1%



What does the future hold?

How can I leverage AI?

What role is harder to replace, the actuary or the data scientist?

How do I tap into the gig economy?

Does it make sense for me to keep this function in house or should I outsource?

How do I recruit the new skill sets I need?

How do I retain key employees?

How do I meet evolving needs with the same or less human resources?

How does my distribution need to change to tap into evolving customer demands?

What new technologies might change how I work and what technologies might change insurance?

Polling question #3

What are you looking forward to most as an actuary in the future?

- A) Leveraging technology so I can focus on more interesting aspects of work
- B) Flexible working arrangements
- C) Opportunities to continually learn

