



## Session 115: Predictive Analytics in the Canadian Life & Health Insurance Industry

[SOA Antitrust Compliance Guidelines](#)

[SOA Presentation Disclaimer](#)

**Deloitte.**

# Session 115: Predictive Analytics in the Canadian Life & Health Insurance Industry

SOA Annual Meeting  
Jean-Yves Rioux

October 2019



# Project Overview



## Goal

- Investigate how the Canadian life insurance industry is utilizing predictive modeling and examine potential areas for enhancement



## Methodology

- 15 entities were selected to participate
  - Mix of direct writers, reinsurers and bank-owned insurance subsidiaries
  - Survey administered through interviews with participants in mid to late 2018
    - The survey questions were organized according to the “DELTA” framework
    - Research also included: literature review, interviews with subject matter experts



## Results

- Formal report of industry aggregate results published by the CIA & SOA in February 2019
  - Benchmark presentations to participant

## 15 organizations participated :

- BMO Insurance
- Desjardins
- Empire Life
- Great-West Life
- Industrial Alliance
- Ivari
- Manulife Financial
- Munich Re
- Optimum Re
- Partner Re
- RBC Insurance
- RGA
- SCOR
- SSQ Financial Group
- Sun Life Financial

# Background

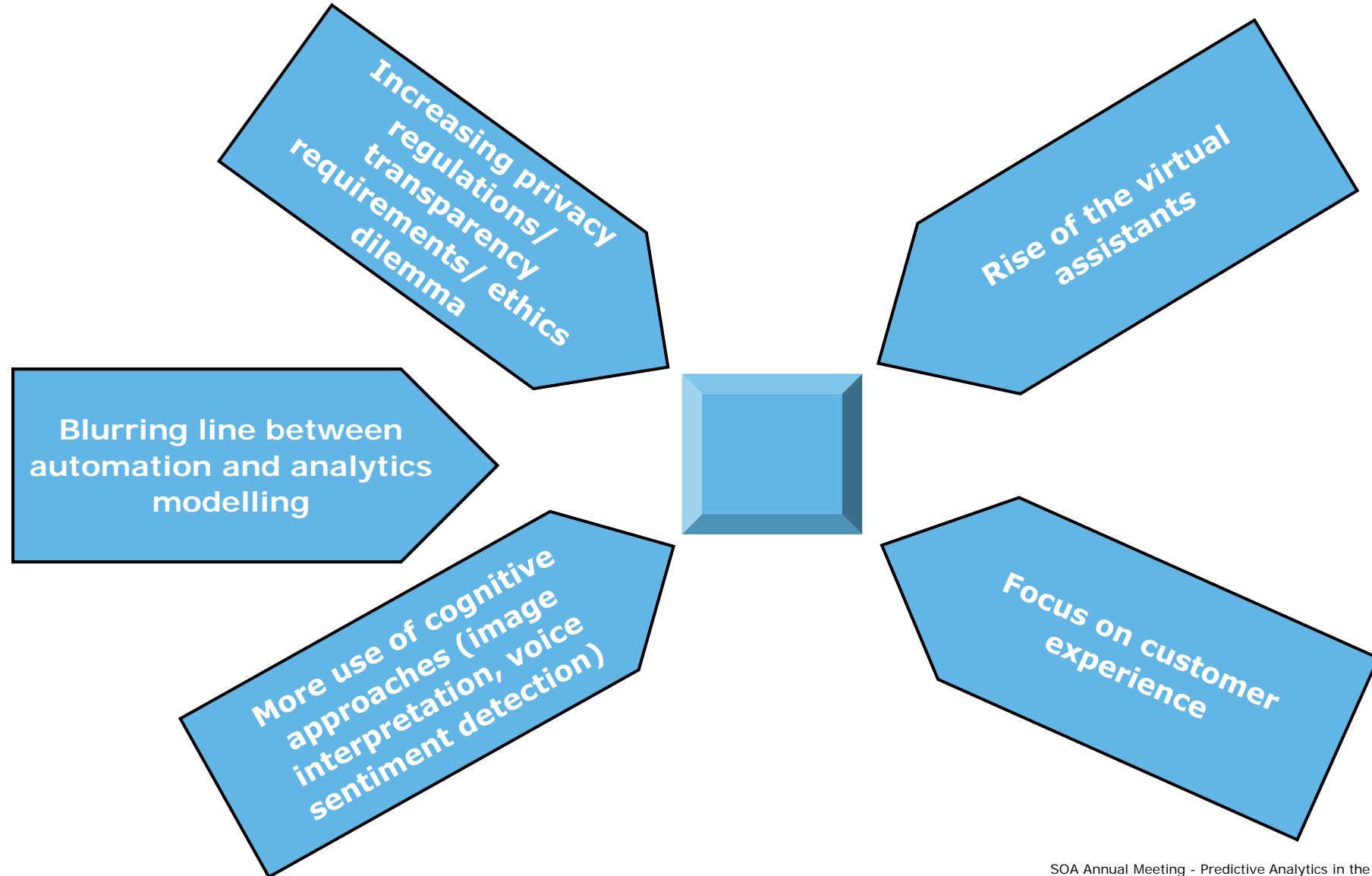
## Scoring Framework

Deloitte analyzed the survey responses under a number of themes with respect to the DELTA analytics maturity model (“DELTA model”), with definitions for each theme as outlined below. Questions in each category were scored and weighted for purposes of determining the score for each category and overall.

Theme	Description	Concepts
Data	Data is the starting point for all analytical work at an organization. Is the data clean, easy to access, and effective?	<ul style="list-style-type: none"> <li>• Consistency</li> <li>• Quality</li> <li>• Ease of access</li> <li>• Centralization</li> </ul>
Enterprise	It is important to have strong governance and coordination within the analytics function and underlying infrastructure. Are formalized governance policies in place and is there a strong coordination of analytics resources across the organization?	<ul style="list-style-type: none"> <li>• Policies</li> <li>• Coordination</li> </ul>
Leadership	The senior leadership team must be committed to the entire process. Are they willing to hire the right people, spend time building the correct systems and processes?	<ul style="list-style-type: none"> <li>• Executive in place</li> <li>• Awareness</li> <li>• Buy-in/ priority</li> </ul>
Targets	Goals and targets should be identified for the analytics work. Have the strategic decisions and users been identified?	<ul style="list-style-type: none"> <li>• Use</li> <li>• Projects</li> </ul>
Analysts	No two analysts are the same and it is important to identify the correct fit for each organization. Have analysts been hired that fit the business requirements to succeed in doing analytics work?	<ul style="list-style-type: none"> <li>• Skills</li> <li>• Deployment</li> </ul>

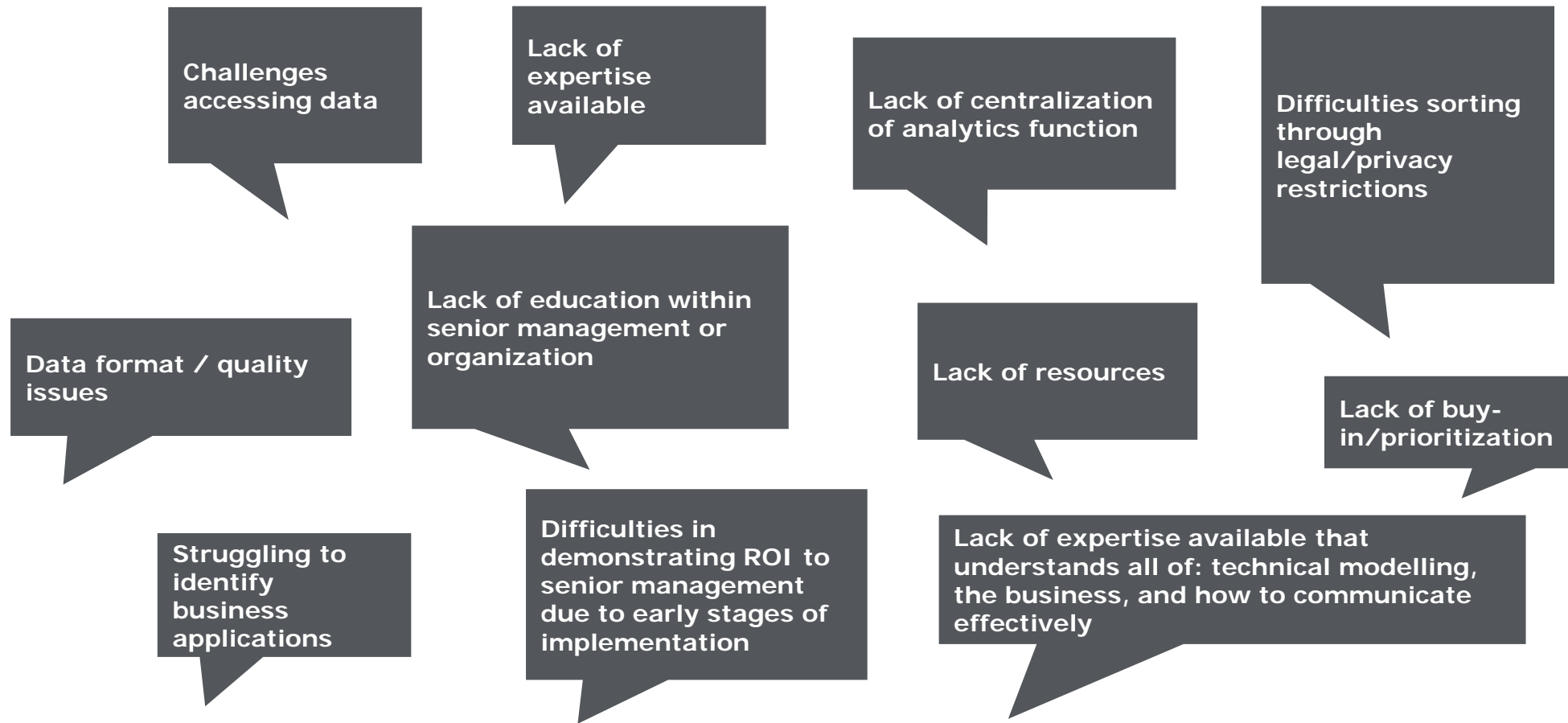
# Research

## Trends impacting analytics applications



# What the industry is saying

## Key Challenges



# What the industry is saying

## Learning objectives of Predictive Analytics



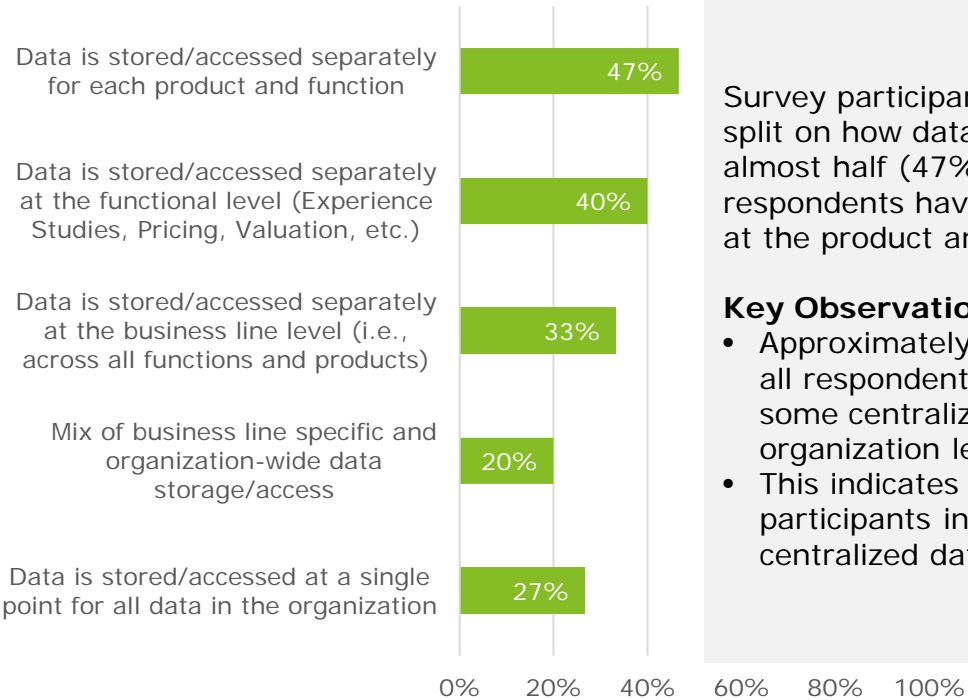
# Detailed Results Data



# Centralization of data

## What best describes the centralization of your data?

% of Respondents Answering Each Choice

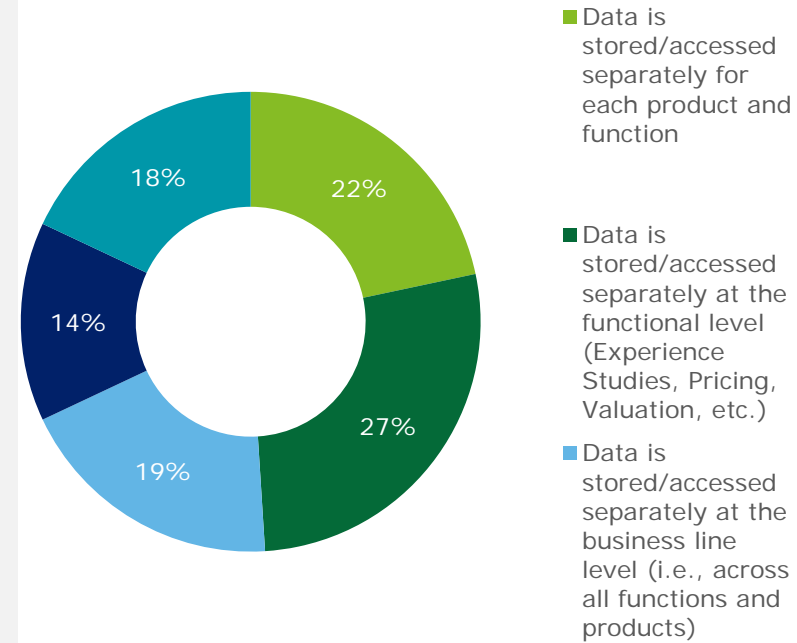


Survey participants appears to be split on how data is organized, with almost half (47%) of the respondents having segmented data at the product and function level.

**Key Observations:**

- Approximately one-third (27%) of all respondents indicated to have some centralized data at organization level.
- This indicates a gap for most participants in having a centralized data repository.

By Average % of All Data



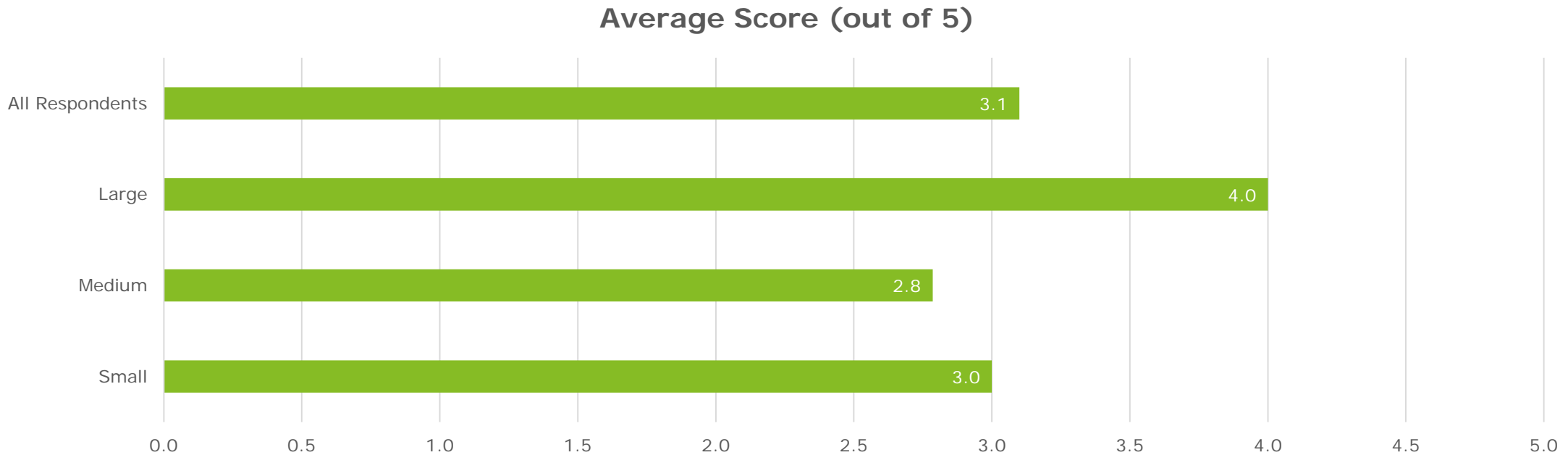
Survey participants appears to be split on how data is organized, with almost half (47%) of the respondents having segmented data at the product and function level.

**Key Observations:**

- Approximately one-third (27%) of all respondents indicated to have some centralized data at organization level.
- Overall, 18% of all data owned by survey respondents is centralized. In our experience data centralization is more likely more difficult to achieve for a large company with many legacy systems than for a smaller company.
- 68% of data is decentralized at the Business Unit or lower levels. We also observe that reinsurers have less centralized data than direct insurers.

# Data Quality

On a scale from 1 to 5, how would end users rate the completeness and accuracy of your data?



Participants rated completeness and accuracy of their data as 3.1 out of 5 – not a bad score, but shows significant room for improvement.

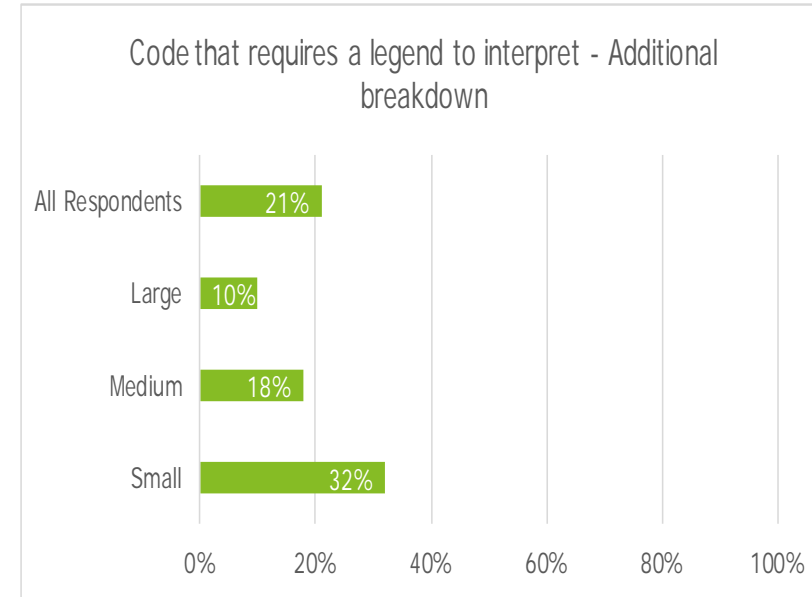
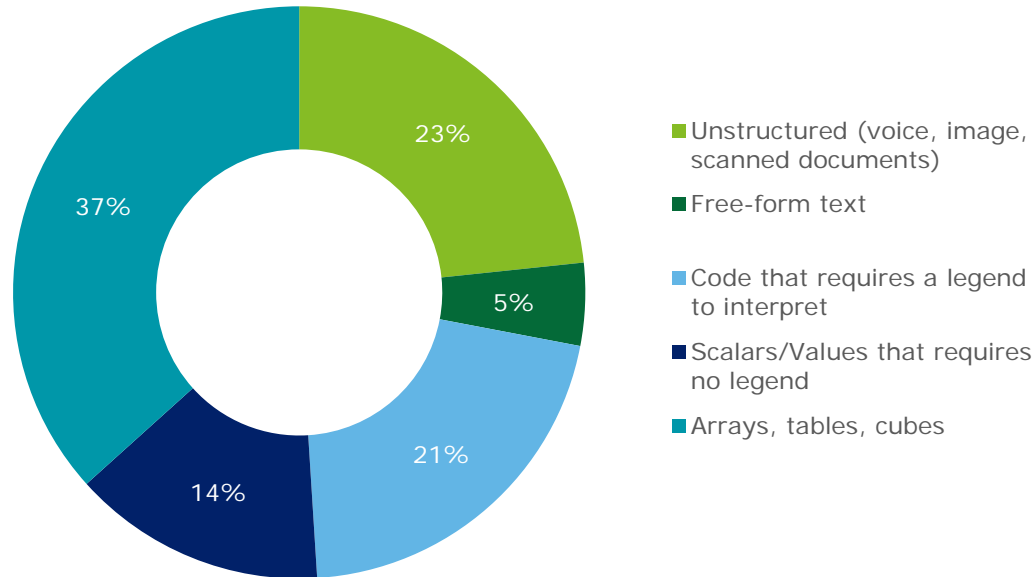
## Key Observations:

- No entity answered that they view their data as perfect (5 out of 5).
- There is a small difference between score indicated by Medium size companies versus Small size companies. Large group respondents assessed themselves with a much higher average score than other respondents.
- There is only a minor difference between direct writers (3.14/5) and reinsurers (3.00/5).

# Data Structure/Format

Provide an approximate percentage of your data that is in each of the following categories

Industry Average Proportion



Overall, there is a fair volume of unstructured data, with 23% identified as such, regardless of size grouping.

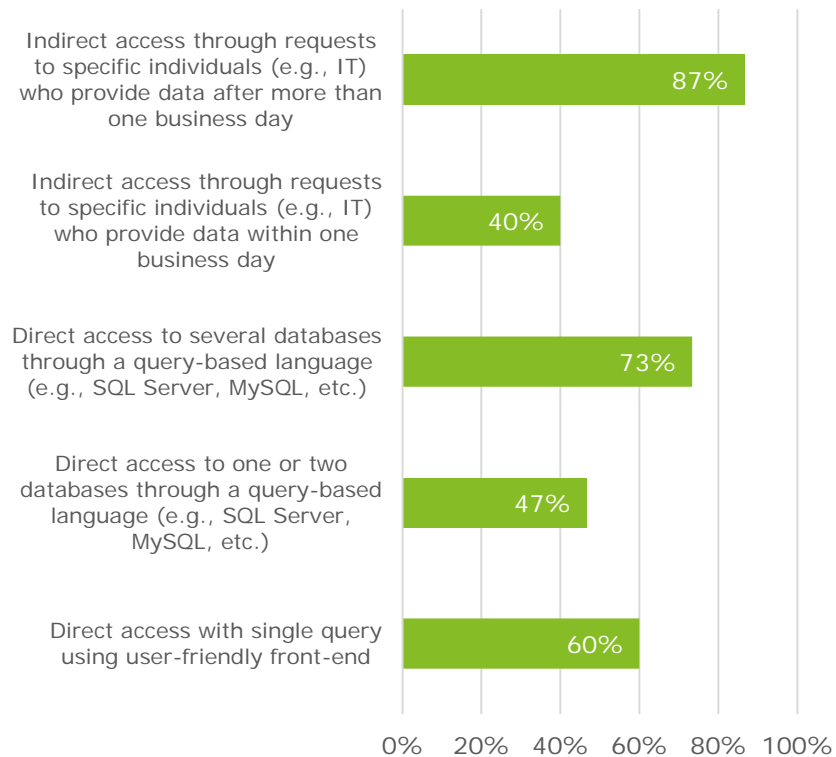
## Key Observations:

- Only 5% of the data was identified as free-form text.
- As a result, less than one-third (28%) of respondents manage data in either unstructured or free-form text format.

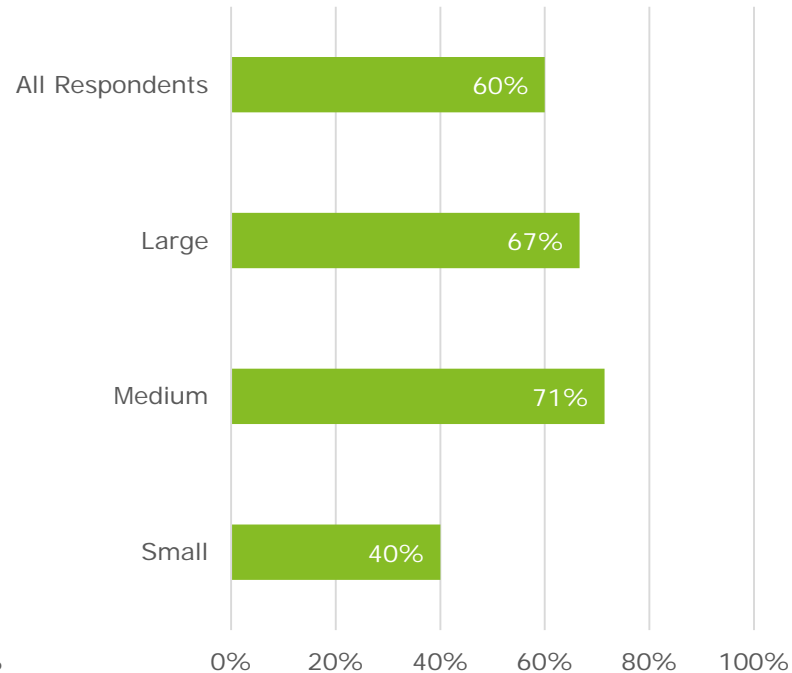
# Data Access

How is data accessed across the organization? (Select all that apply)

Percentage of Respondents



Direct access with single query using user-friendly front-end - Additional breakdown



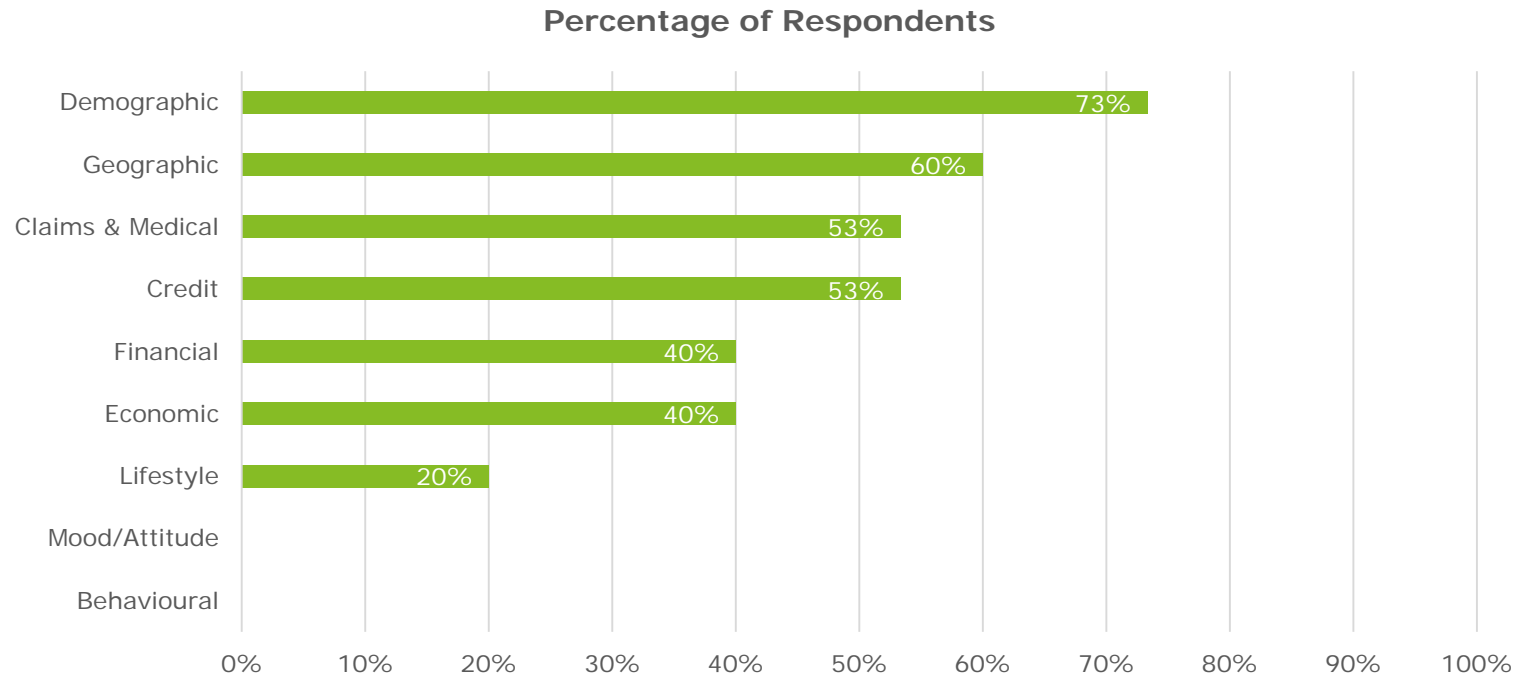
The majority of the survey participants still request at least some data through specific individuals who are not members of their analytics group (such as a separate IT team).

**Key Observations:**

- Of these respondents that are requesting through another source, most (87%) have a wait time that is >1 business day (vs. 40% with <= 1 business day). All large size and medium size respondents have such a delayed process, whereas a fraction of the small size respondents do not.
- Direct access with single query using friendly front-end exists more for large (67%) and medium (71%) entities than they do for smaller entities (40%).

# External Data

What types of third party data does your organization currently use for analytics? (Select all that apply)



Of those performing predictive analytics, all respondents indicated that they are currently using third party data sources to supplement their own data. This is a strong signal that survey participants are willing to invest in their own analytics capabilities, and that they trust these third party sources.

### Key Observations:

- Mood/Attitude and Behavioral: No respondent uses third party data.
- Claims & Medical: It could be interpreted that some large insurers treat their internal data as sufficient.
- Lifestyle: A majority (2/3) of large insurers use third party data, whereas only 1 small insurer does.
- Financial Data: Not used at all by small group respondents.
- Credit: Only 1 large size respondent is using third-party credit data; higher usage exists for the medium and small size respondents.

Generally, the larger size the respondent, the more they tend to use third-party Demographic, Geographic, Financial, and Economic data.

Additionally, Credit and Economic data are more used by direct writers than by reinsurers.

Due to the analysis in which these data sources are typically used, we can infer that third party sources are mainly used for experience analysis (such as mortality rates, lapse rates, and conversion rates).

Examples of external data vendors included: StatsCan, Environics, Transunion, Equifax, VivaMetrica, Trillium, Canada Post.

# Wearables & Sensor Data

Have you started collecting data through new technologies (i.e. Fitbit) to augment the use of traditional sources of data?

Percentage of Respondents



The current state of using wearables and other new technologies to collect data shows significant room for growth.

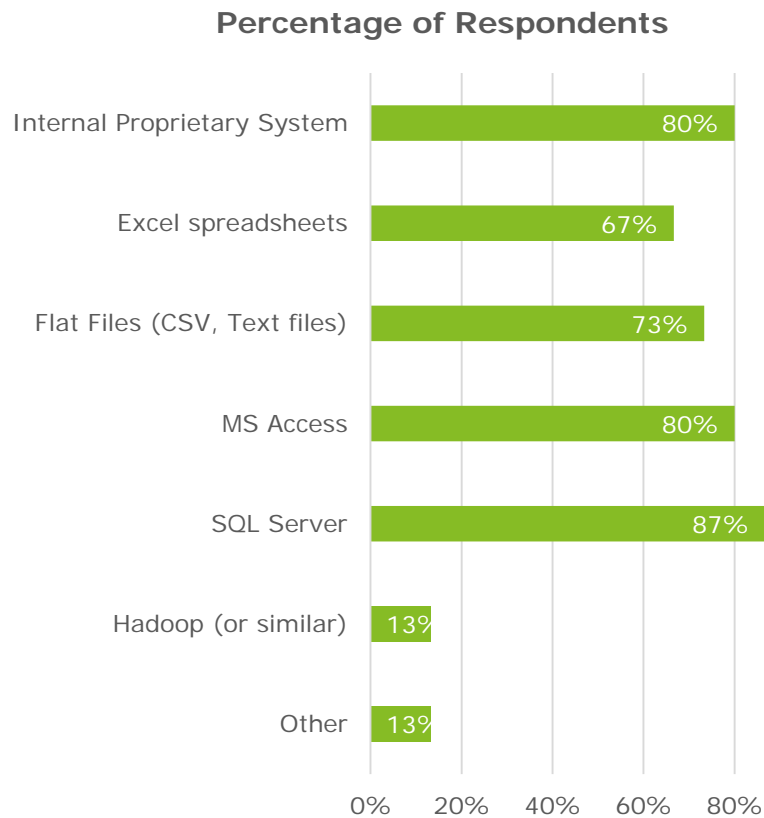
**Key Observations:**

- One entity from each size group (large, medium, small) has indicated that they have collected this type of data and are currently using it.
- No company has indicated that they collected data and are not using it, nor have any investigated and decided not to collect/use this type of data.
- All large size entities that have not collected such data yet are investigating the value of augmenting data through new technologies. The same is true of all but two medium size entities.

Generally, the majority of the industry is either using, or looking to use, data from new technologies. This confirms a growing sentiment that alternative data sources could be valuable to insurers and reinsurers. However, it is unclear at this time whether or not the use of this data is providing a competitive advantage for those entities.

# Internal Data Storage

How do you store your internal data?

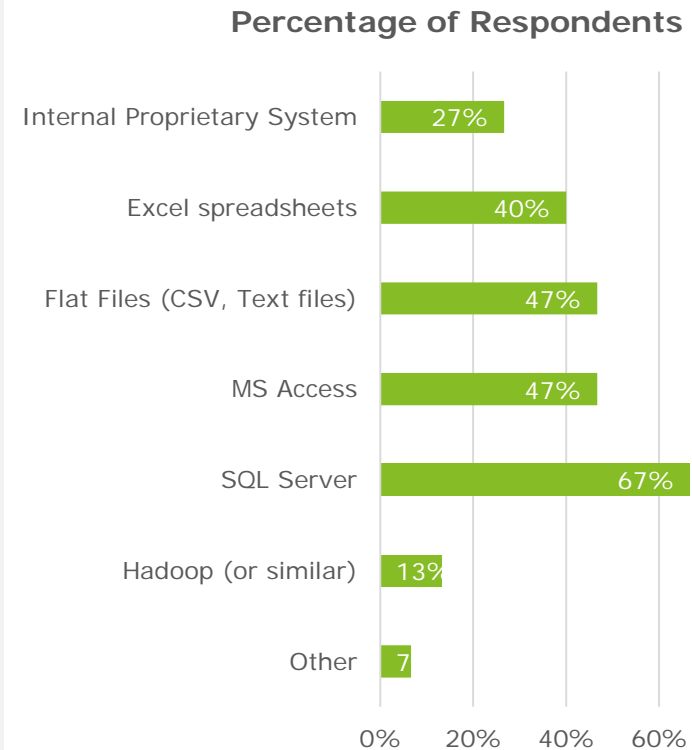


### Key Observations:

- The most popular platforms to store internal data included: SQL Server (87%), Internal Proprietary System (80%), MS Access (80%), Flat Files (73%), and Excel (67%). Hadoop was also mentioned.
- Other software mentioned included: DB2 and FileNet.

# External Data Storage

How do you store your external data?



### Key Observations:

- As expected storage platform used for internal data and external data is quite different.
- Third party data is stored more regularly within a relational database. Typically, third party data already comes in a structured format, where the relation between tables is spelled out, so it is easier to store in a relational database. However, this could also be an indication of entities that are purchasing third party data are being more technically sound with data management and thus prefer to store within a relational database.
- Hadoop (or similar software) is still only used by a smaller portion of the industry. We may see this percent grow in coming years as the industry does seem to handle a high level of unstructured data.

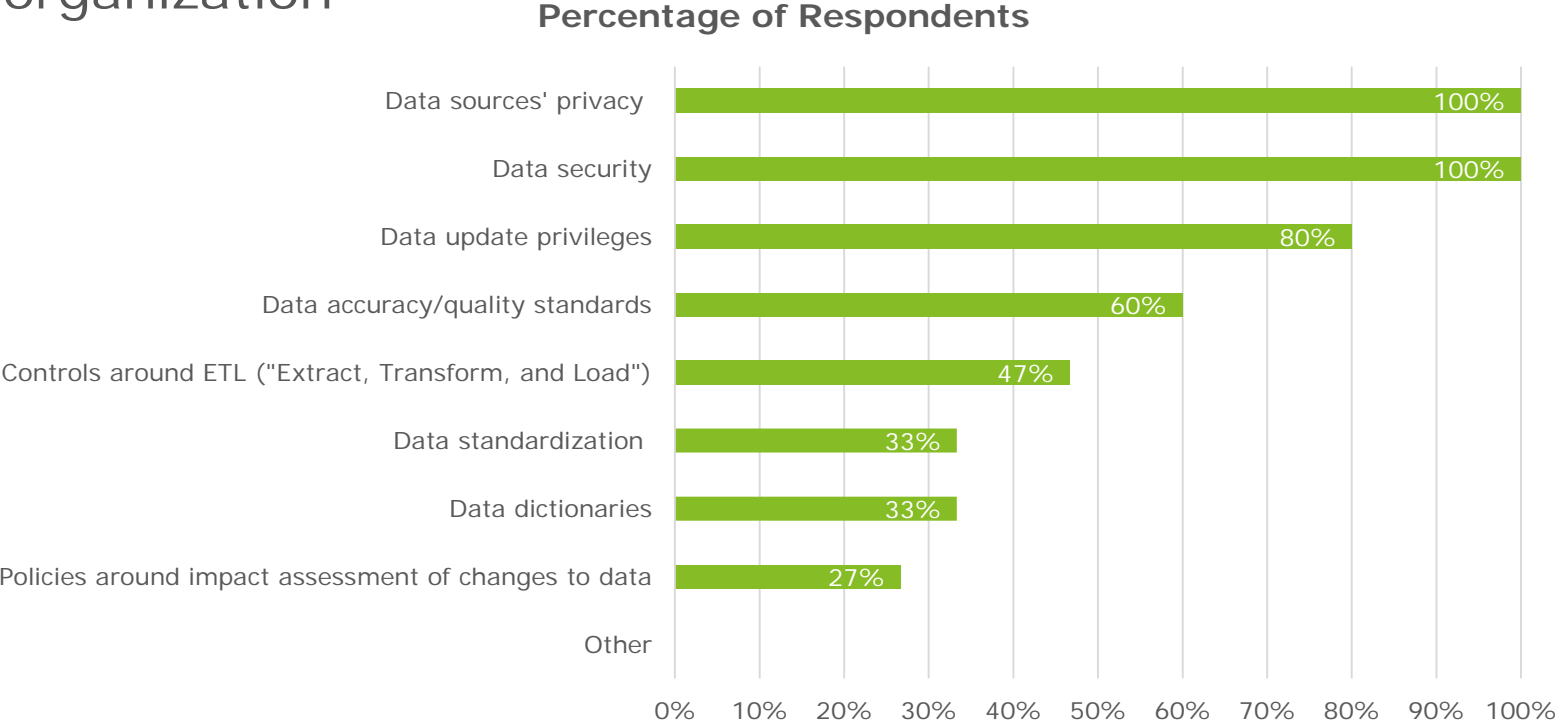
# Detailed Results

## Enterprise



# Governance - Data

## Select the governance aspects and policies surrounding data used in analytics in your organization



**Key Observations:**

- All respondents indicated having governance/policies around data privacy and data security. Other popular governance/policies in place included: data update privileges (80%), data accuracy/quality standards (60%), controls around ETL (47%).
- Few respondents (approximately one-third) have governance/policies around standardization, producing data dictionaries, and around data change management.
- There is a higher focus on governance/policies for data update privileges, data accuracy, and quality standards for larger respondents.

The highest emphasis is placed on data privacy and data security. This is logical given the private nature of the data handled by direct writers and reinsurers. There is a high risk associated with exposing sensitive information and the industry is actively taking the required steps to mitigate this.

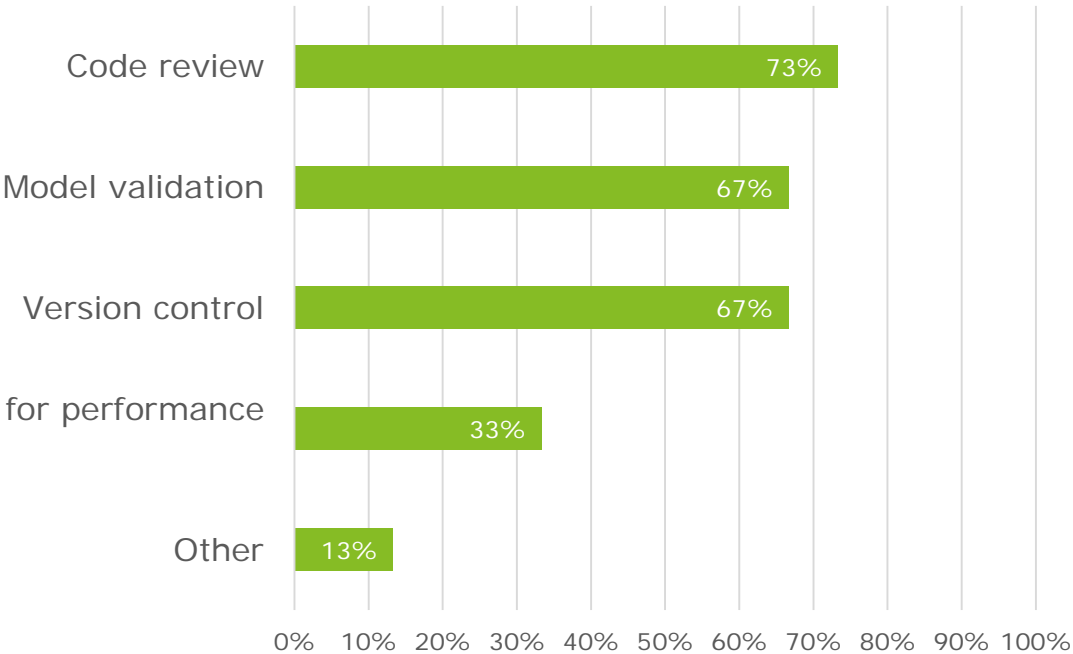
There is less emphasis on governance policies that can assist with predictive modelling. It appears that since there is a lower risk associated with these policies, some entities are not enacting them. That being said, there is still risk associated with lack of knowledge regarding one's own data. It is regarded as best practice to at least acknowledge procedures for each of the items listed above.

Medium/small size survey participants need to bridge the current gap with large size participants with respect to governance around data (specifically data updates, data accuracy, and standards).

# Governance – Modelling Activities

Select the governance aspects and policies that impact modeling efforts for your organization

Percentage of Respondents



**Key Observations:**

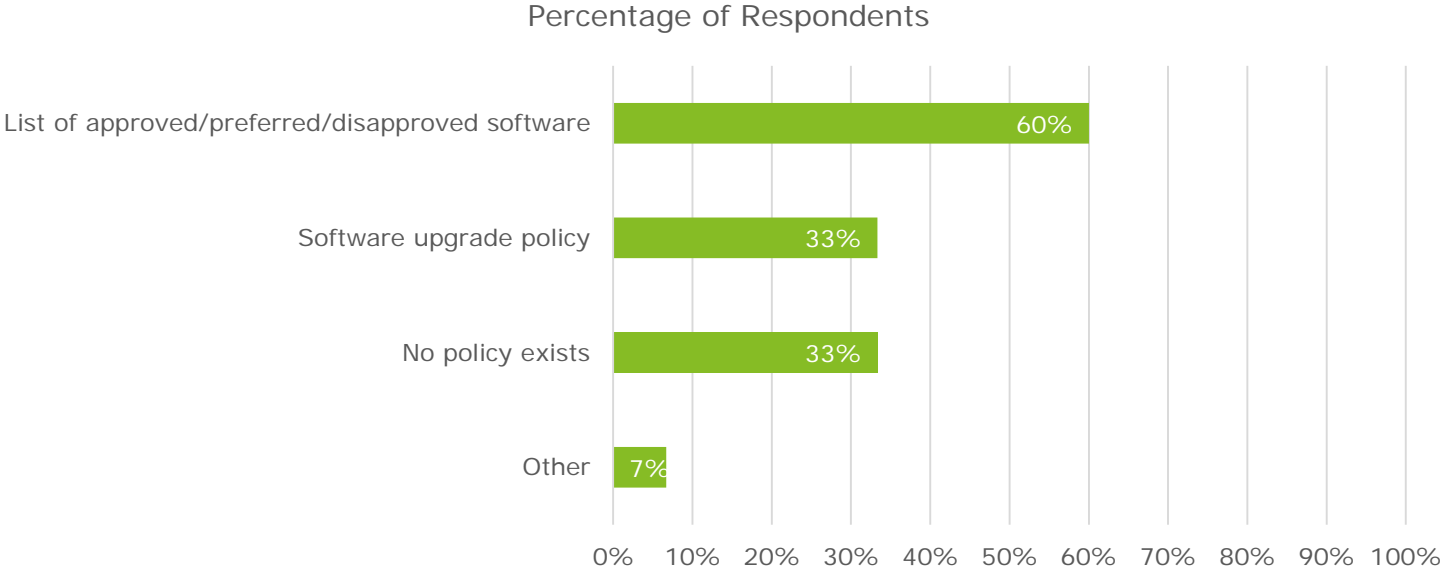
- About two-thirds of the industry have governance policies for their predictive models. The remaining one-third of the industry perform very minimal predictive modelling work to begin with and so governance policies in this field are a lower priority.
- Most popular governance/policies impacting the modelling included: code review (73%), model validation (67%) and version control (67%), which are all important to the modelling process.
- Other responses mentioned included documentation standards (“style guides”), issue tracking, code documentation, and automated testing procedures.
- One interesting result is only about one-third of the industry has a governance policy regarding the evaluation metrics for performance of models.

All of the large respondents have model validation, code review and version control but only two-thirds of them have identified metrics. The identification of appropriate evaluation metrics and the definition of the criteria is an important consideration for selecting the optimal model and companies would benefit from adopting such policies.

Medium/small size survey participants should address the gap with respect to governance around modelling (specifically model validation, code review, and version control). Several companies have acknowledged that these governance processes may exist on an informal basis. As companies’ analytics functions mature, we expect processes to be standardized and governance to be standardized.

# Governance – Software and Technologies

Select the governance aspects and policies relating to software and technology used in analytics applications for your organization



**Key Observations:**

- Popular governance/policies around software and technology included: list of approved software (60%), software upgrade policy (33%).
- As much as one-third of respondents had no governance/policies in place regarding software and technology. We would have expected very few not to have such policies in place.
- Other governance/policies indicated by respondents included: standardized development environment, deployment guideline, pre-production/production environment policy.
- Two-thirds of large size respondents have a list of approved/preferred/disapproved software. Only one large size respondent, two medium size respondent, and two small size respondent have software upgrade policies. Thus, only 5 out of 15 survey respondents indicated they have software upgrade policies.

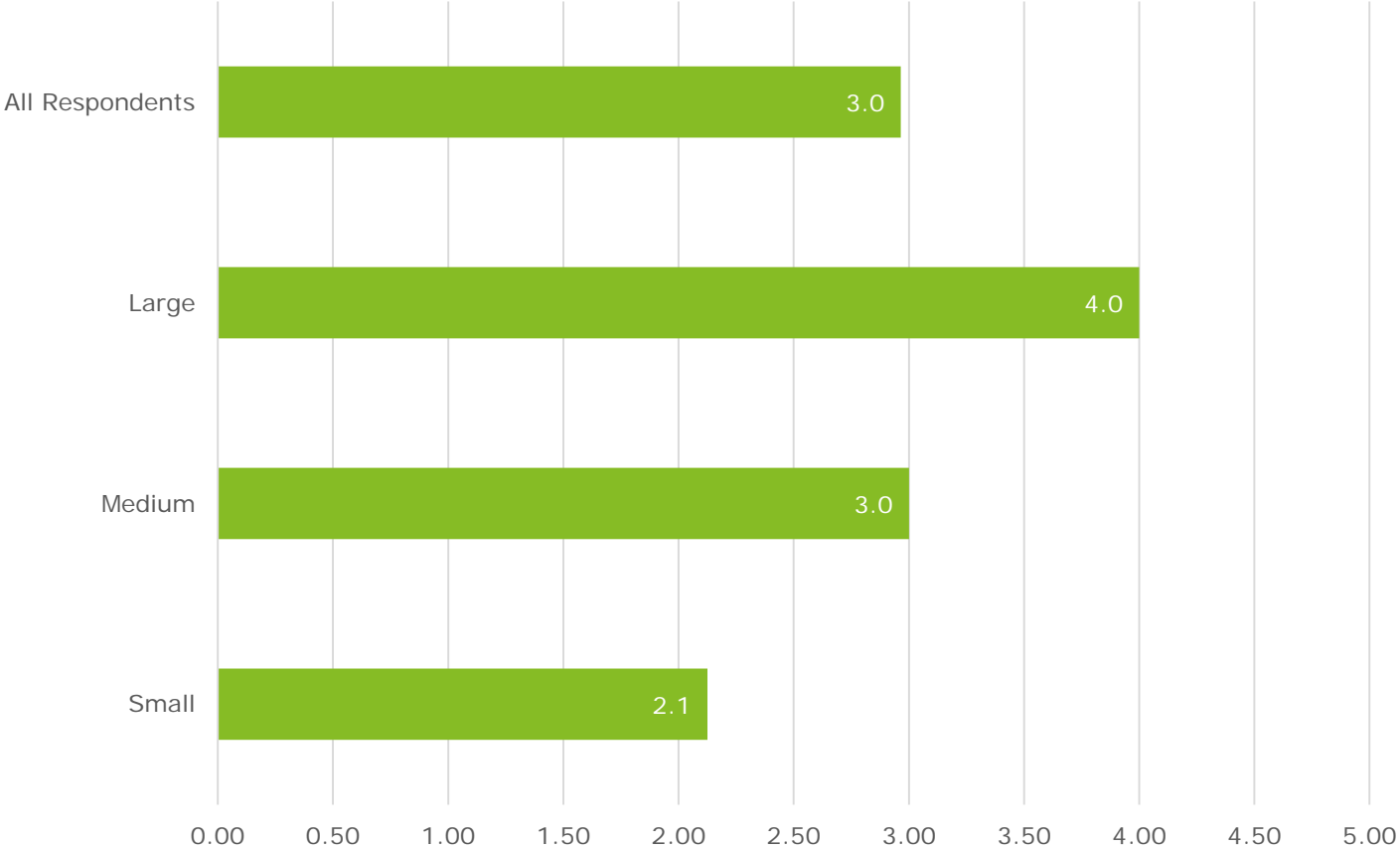
Overall, there is less governance in place for software, when compared to both data and models. One hypothesis for why this is the case is based on the phenomena of open-source software. As later questions in this survey have demonstrated, open-source software (R for example) have become the most commonly used by survey participants. Governance policies would need to be reviewed on a frequent basis if they are to stay up to date with all the developments for open-source software and their packages.

Special consideration will need to be made in the future with regards to user-written packages in open source software. While the base code may be tested on a regular basis, user-written code might not be tested appropriately. It may be noteworthy to identify if there will be a potential shift in the future where businesses start to write more governance policies on user-written packages.

# Coordination of Analytics Skillsets & Resources

If the analytics functions is not fully centralized, please assess the strength of the skills and resources coordination across the organization

Average Score (out of 5)



**Key Observations:**

- Overall, respondents self-assessed the strength of the skills and the resource coordination with a score of 3.0 out of 5.
- Large size respondents have self assessed much higher skills and resource coordination with a score of 4 out of 5, followed by medium size respondents with a 3 out of 5, and small sized respondents scoring 2.1 out of 5.
- The overall score suggests that there is a certain level of acceptable coordination occurring across the survey participants, yet there is still room for improvement.

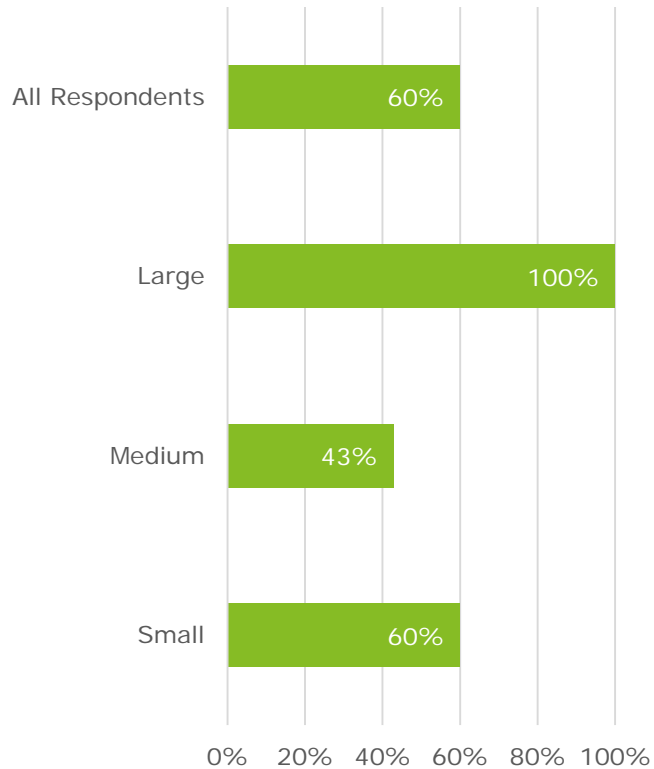
# Detailed Results

## Leadership

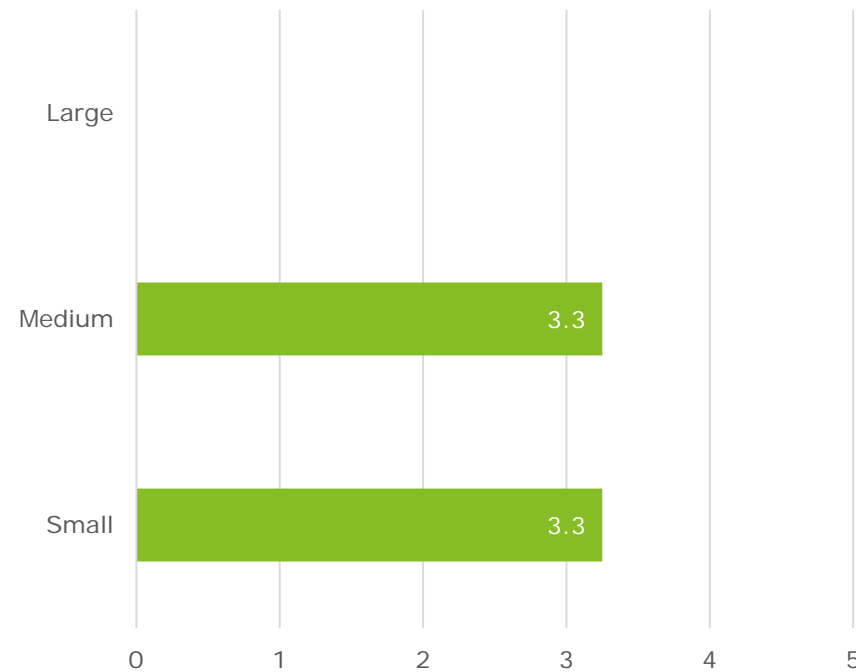
# Data Leadership

Does your organization have an executive responsible for data and what is his/her title? If not, how much does leadership understand data (quality, structure, safeguards, etc...)?

Percentage of Respondents



Avg. Score – Leadership Understanding of Data if no Executive is Responsible



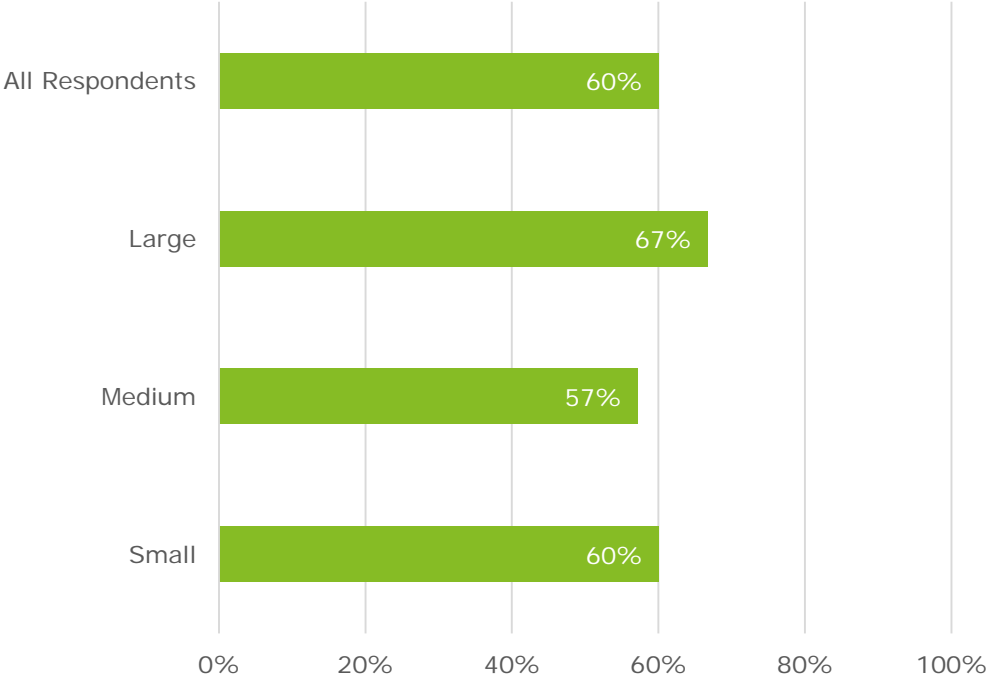
## Key Observations:

- Overall 60% of the survey participants have an executive responsible for data, with all large size respondents indicating the existence of such a role. Surprisingly, more of the small respondents than medium respondents had this role, although it is unclear if this executive had other responsibilities (e.g. CIO).
- In cases where there is no executive responsible for data, the self-assessed leadership understanding of the data was 3.3 out of 5.

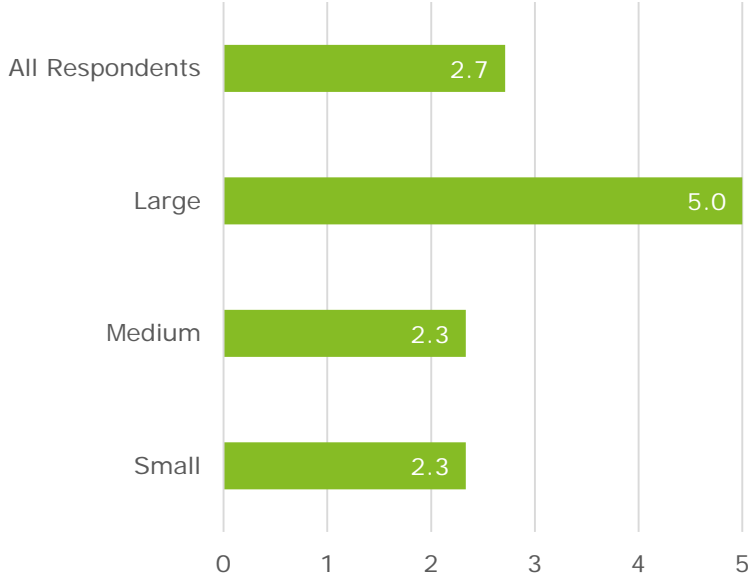
# Predictive Analytics Leadership

Does your organization have an executive responsible for predictive analytics and what is his/her title? If not, how much does leadership understand its value-added opportunities and competitor's initiatives?

Percentage of Respondents



Avg. Score – Leadership Understanding of Predictive Analytics if no Executive is Responsible



**Key Observations:**

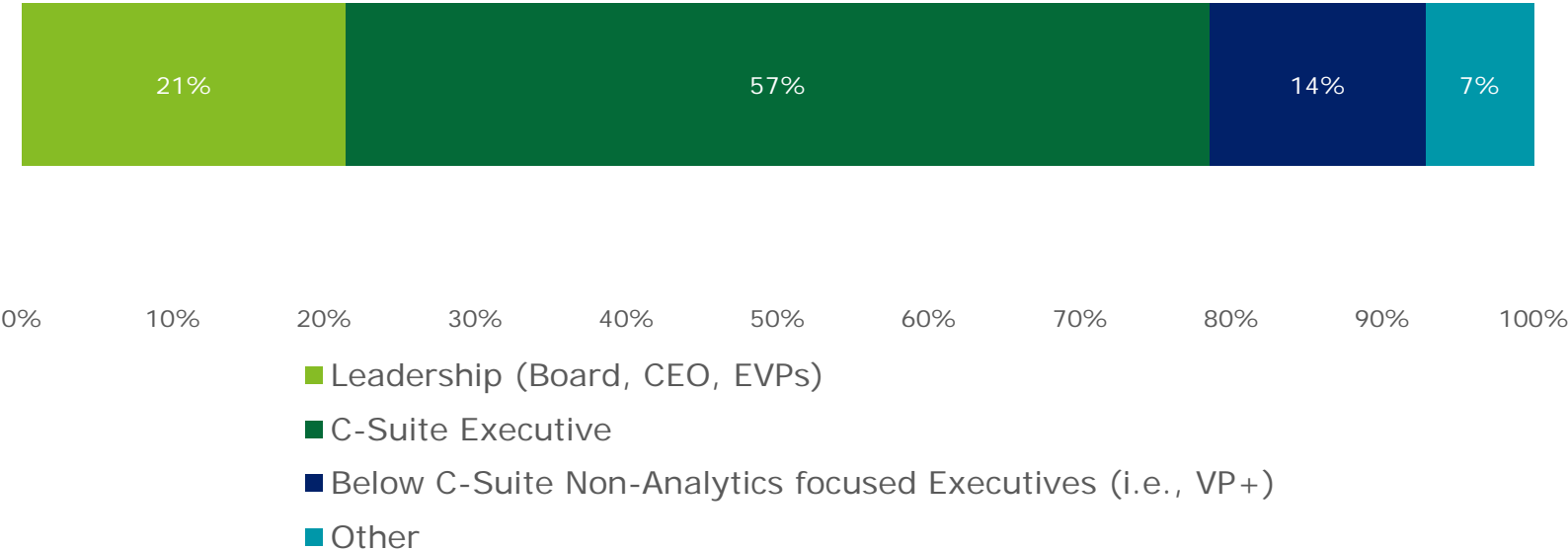
- Overall 60% of the survey participants have an executive responsible for predictive analytics, with more (67%) of the large size respondents indicating the existence of such a role.
- In cases where there is no executive responsible for analytics, the self-assessed Leadership understanding of the value-added opportunities and competitor's initiatives was of 2.7 out of 5.
- Large respondents indicated a perfect understanding.

This implies that, for other-than large size companies, it can sometimes be a struggle to get buy-in for the need/results of predictive models from Senior Executives, especially at the early stages of a company's predictive analytics journey. Similarly, this could be moved forward through easy to use dashboards, or in the case of predictive modelling, converting to a quantifiable result that is easy to understand by Senior Executives.

# Predictive Analytics Decision-Making

## Who makes the final decision on the prioritization of predictive analytics initiatives?

Percentage of Respondents



**Key Observations:**

- The majority of the survey participants (78%) have indicated that the senior executive leaders (i.e. C-Suite or higher) make the financial decisions when it comes to predictive modelling initiatives. Close to one-fifth (21%) of Boards, CEO and EVPs are involved in such decisions.
- Two-thirds of decisions are made at the C-Suite level for large size and medium size respondents, while all decisions are taken by that level for small size respondents.

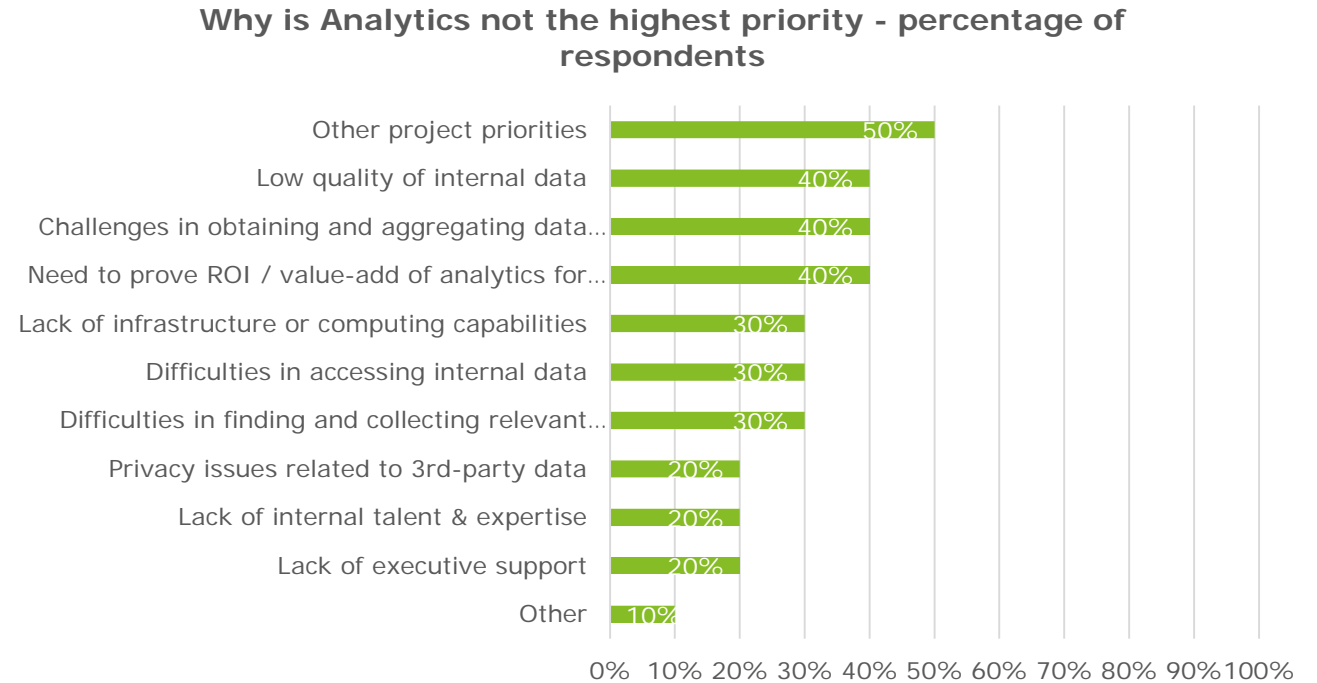
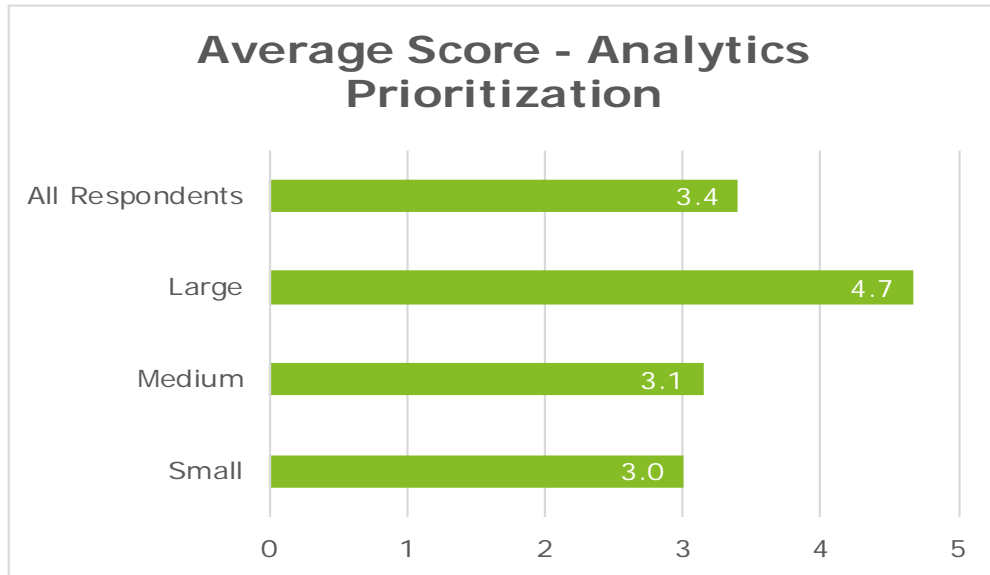
Only one-fifth of Board, CEO and EVPs are involved in decisions surrounding predictive analytics (this appears to us as low and we would have expected more involvement for something as important as predictive analytics).

While these results may be expected, it also shows a disconnect between the financial decisions and the general understanding of data and modelling practices. What this likely means is that trust is being placed on the middle management that they know what they are doing for each predictive modelling initiative.



# Predictive Analytics Prioritization

How does predictive analytics rank within your organization with respect to project priorities? If it is not the highest priority, what are the key reasons (check all that apply)?



## Key Observations:

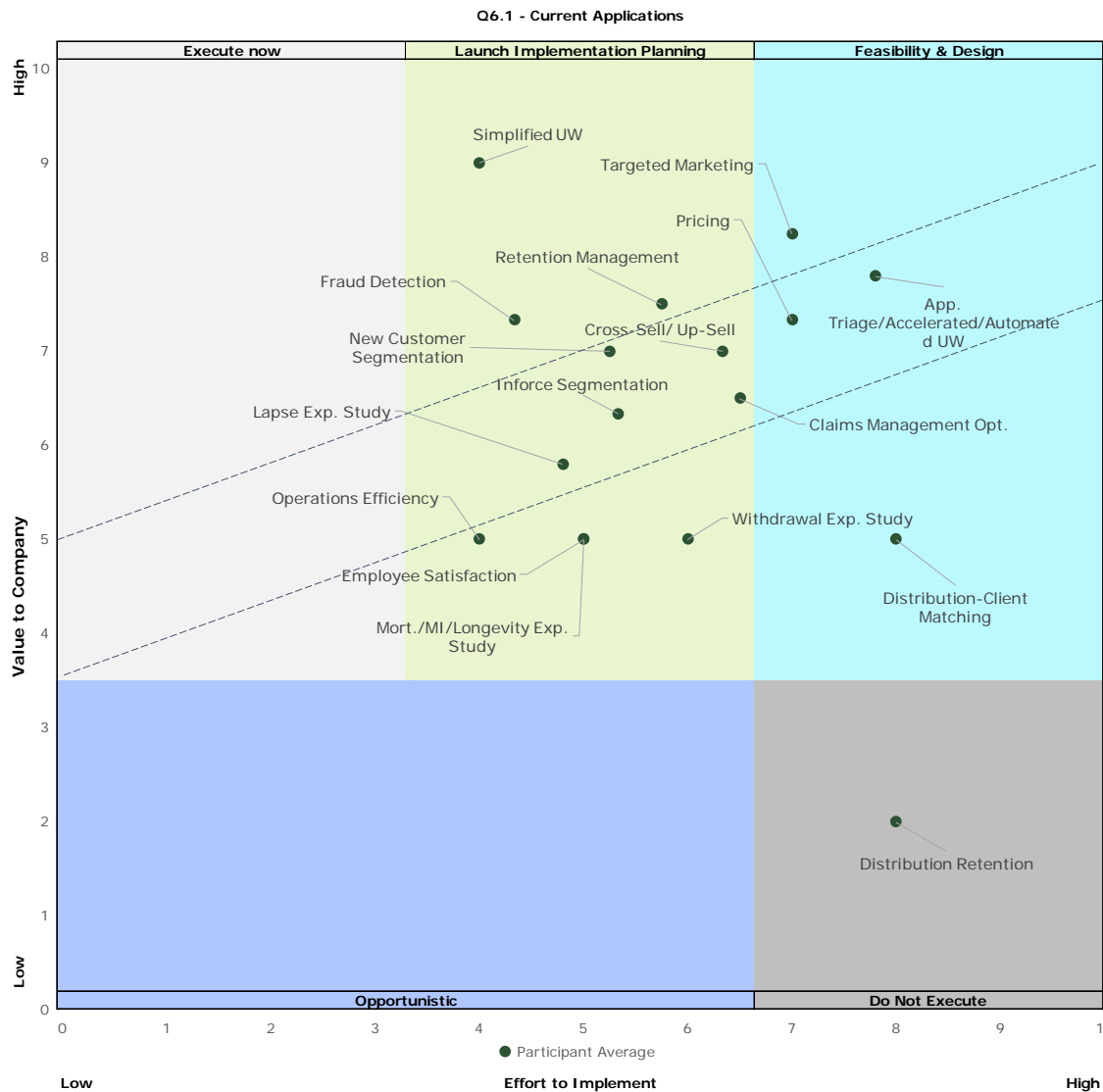
- On average, large size respondents have indicated a high prioritization of analytics initiatives. The prioritization given by medium and small size respondents was lower and not materially different between those size groups. It is worth noting that on average reinsurers have placed a noticeably higher priority (3.8) on analytics initiatives than direct writers (3.3).
- As many as 10 respondents (majority of medium and small sized respondents) indicated analytics as not being at highest priority.
- The most common reasons indicated by them included existence of other project priorities (50%), the low quality of internal data (40%), the challenges in obtaining data from multiple internal data sources (40%) as well as the need to prove ROI (40%).
- Lack of infrastructure or computing capabilities, difficulty in accessing internal data, difficulties in collecting external data were also mentioned.
- There does not seem to be a generalized lack of executive support.

# Detailed Results

## Targets

# Current applications

Describe current and past analytics applications and rate each for value to the company and effort to implement



Prioritization	Application	Count	Score: 2V-E
<b>Higher priority</b>	Simplified UW	1	14
	Fraud Detection	6	10.3
	Targeted Marketing	4	9.5
	Retention Management	4	9.3
<b>Medium priority</b>	New Customer Segmentation	4	8.8
	App. Triage/Accelerated/Automated UW	5	7.8
	Cross-Sell/ Up-Sell	6	7.7
	Pricing	3	7.7
	Inforce Segmentation	3	7.3
	Lapse Exp. Study	5	6.8
	Claims Management Opt.	2	6.5
<b>Lower priority</b>	Operations Efficiency	3	6
	Employee Satisfaction	1	5
	Mort./MI/Longevity Exp. Study	7	5
	Withdrawal Exp. Study	1	4
	Distribution-Client Matching	1	2
	Distribution Retention	1	-4

Most respondents have explored or plan on exploring use of predictive analytics in experience studies.

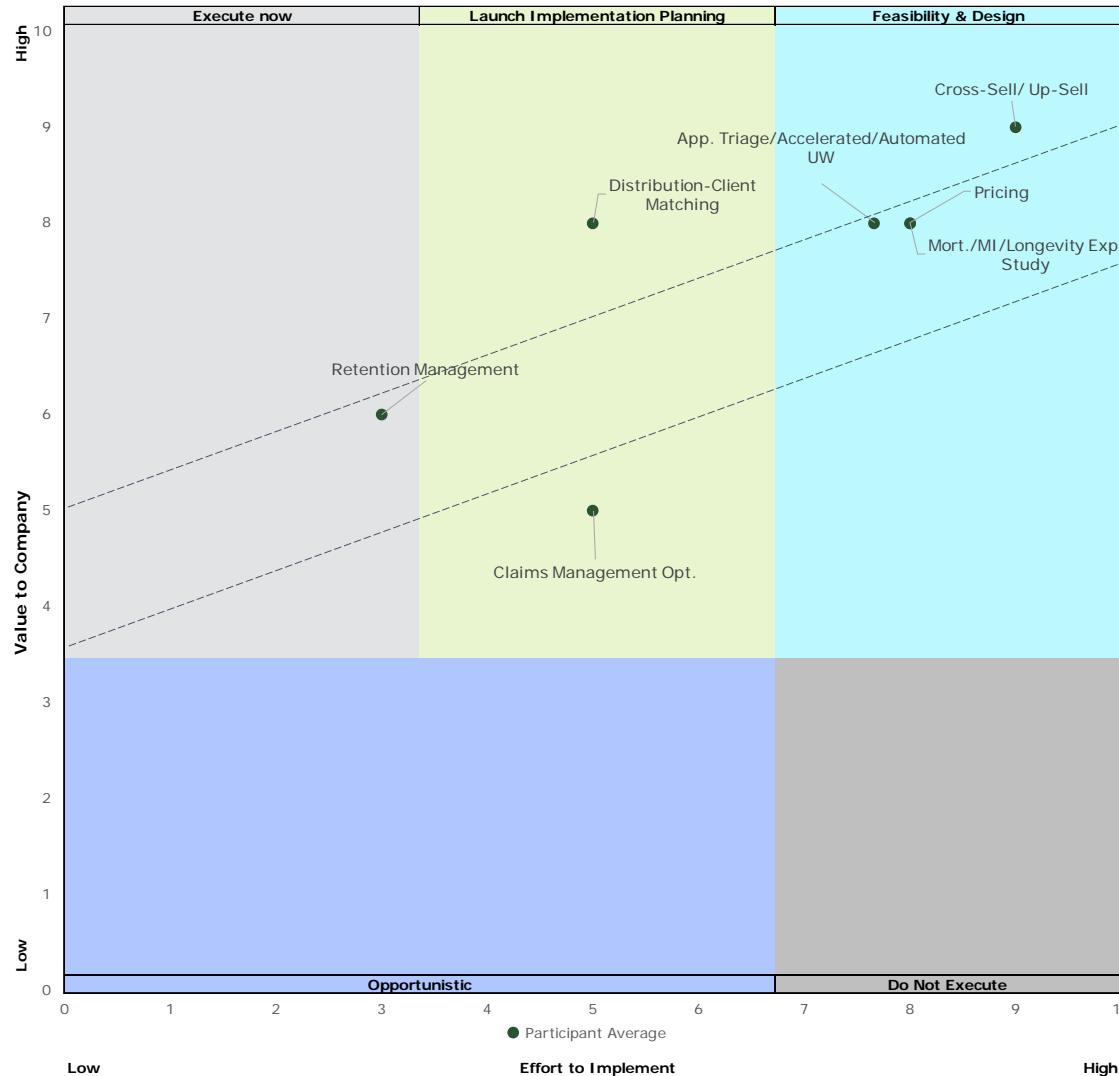
Most respondents, particularly outside of the large size ones, have numerous gaps in the types and breadth of applications, particularly on marketing, retention management, distribution-client matching, and even in accelerated/automated UW.

Companies looking to explore new areas to use predictive analytics can refer to what the industry is valuing highly and sees as relatively lower effort by referring to the top left section of the chart.

# Future applications

Describe analytics applications to be implemented in the next year and rate each for value to the company and effort to implement

Q6.2 - Future Applications



Prioritization	Application	Count	Score: 2V-E
<b>Higher priority</b>	Distribution-Client Matching	1	11
	Cross-Sell/ Up-Sell	1	9
	Retention Management	1	9
<b>Medium priority</b>	App. Triage/Accelerated/Automated UW	3	8.3
	Mort./MI/Longevity Exp. Study	1	8
	Pricing	1	8
<b>Lower priority</b>	Claims Management Opt.	1	5

Most survey participants have not thought about use of predictive analytics to improve internal operations (e.g. workforce analytics, use of Natural Language Processing/Natural Language Generation to speed up processes and reduce errors).

For both, current applications and future applications, readers should use this chart only as a starting point for their planning due to the self-reported nature of the responses and the fact companies will assess value and effort differently.

## Research

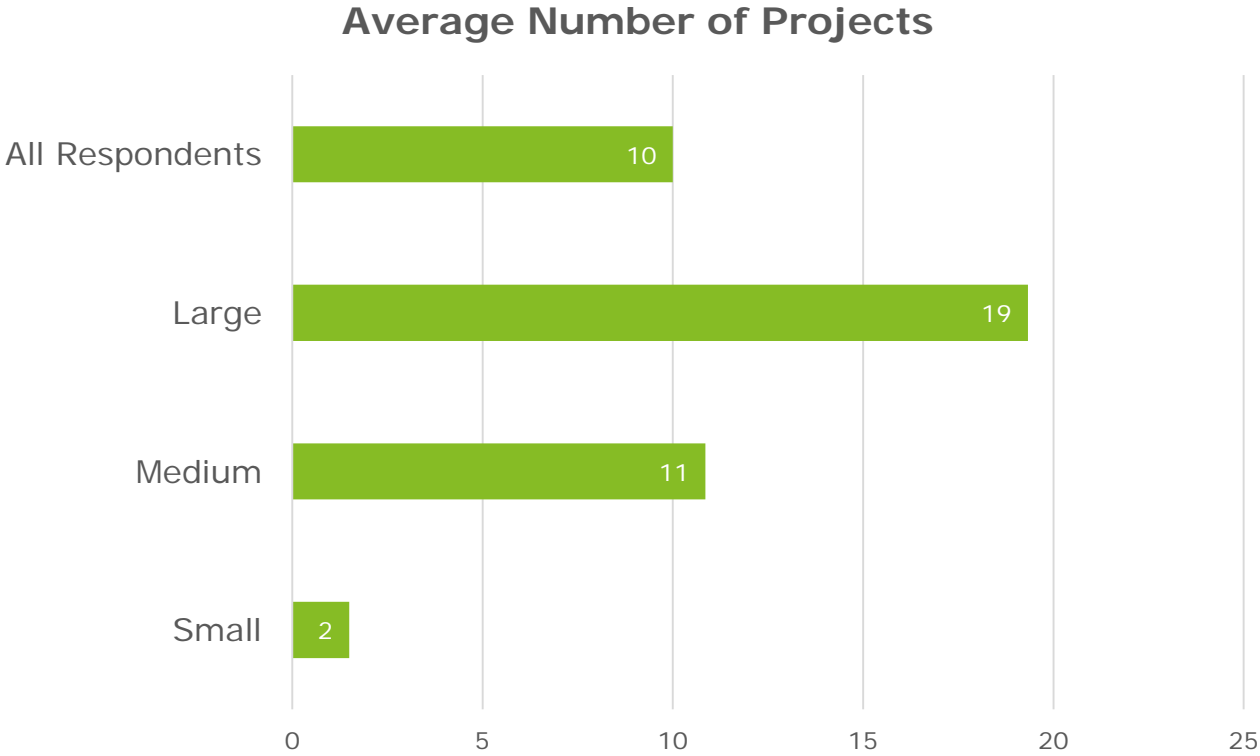
Applications used outside of the Canadian life insurance industry that could have relevance for the industry

### Application

- Optimizing marketing
- Project design
- Cognitive underwriting
- Automated processing of data
- Improved pricing granularity
- Operational processing
- Distribution Strategies (incl. recruiting)
- Robo-advisory sales
- Improved customer experience
- Workforce analytics

# Predictive Analytics Development

## Approximately how many analytics projects have you attempted in the last year?



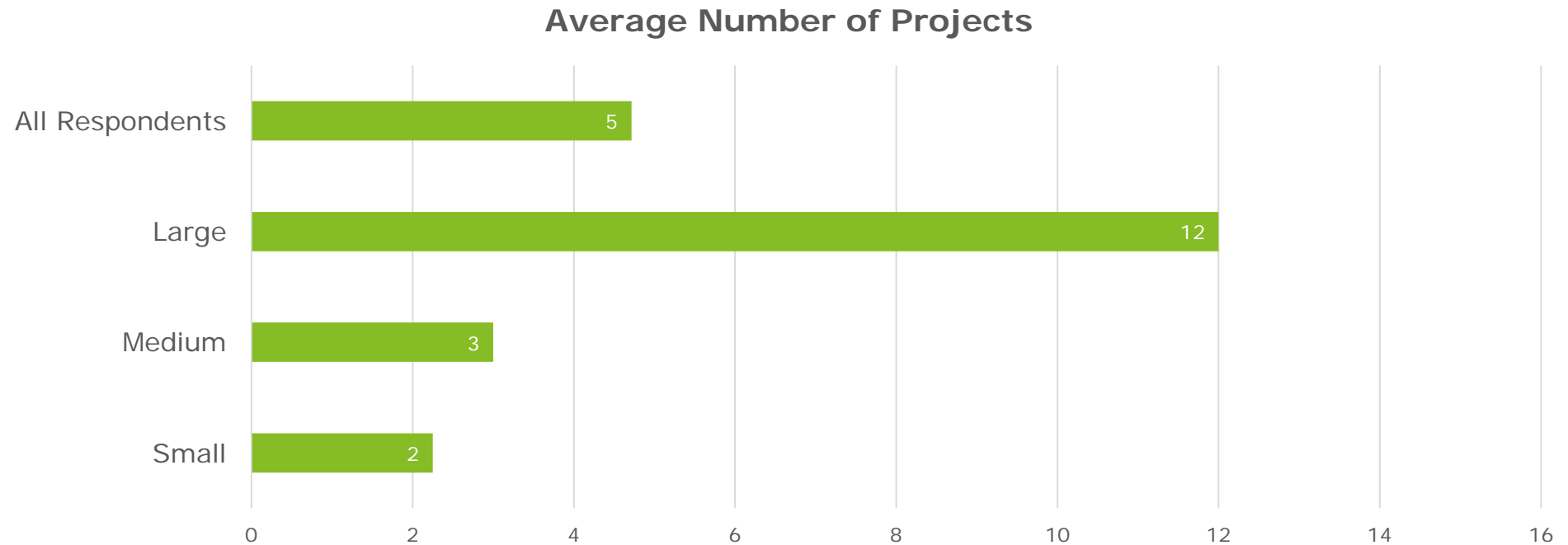
**Key Observations:**

- The survey participants are currently averaging 10 projects in the last year, with 19 projects for large size participants, 11 for medium size participants and 2 for small size participants. One of the large size respondent indicated a large number of projects which increased the average for that category significantly.
- One-fifth of respondents have not performed any projects in the last year.
- As many as 42% had three or less projects, including those that had none.
- None of the small sized entities performed more than 3 projects.

It appears that survey participants are either deeply involved in predictive analytics assignment, or still relatively novice, with a small number of respondents attempting a moderate amount of work in the field. The large size survey participants are, on average, performing more projects than those performed by medium or small size participants.

# Predictive Analytics Development

Approximately how many analytics projects that were not previously executed, are anticipated to be tackled in the next year?



## Key Observations:

- All but one respondent have projects planned for the future.
- A total average of 5 projects is planned across the survey participants, with 12 projects for large size participants, 3 for medium size participants and 2 for small size participants.
- Most respondents will have more than 1 new project.
- The large size survey participants are, on average, planning to performing more new types of analytics compare to that planned by medium or small size participants.

# Detailed Results

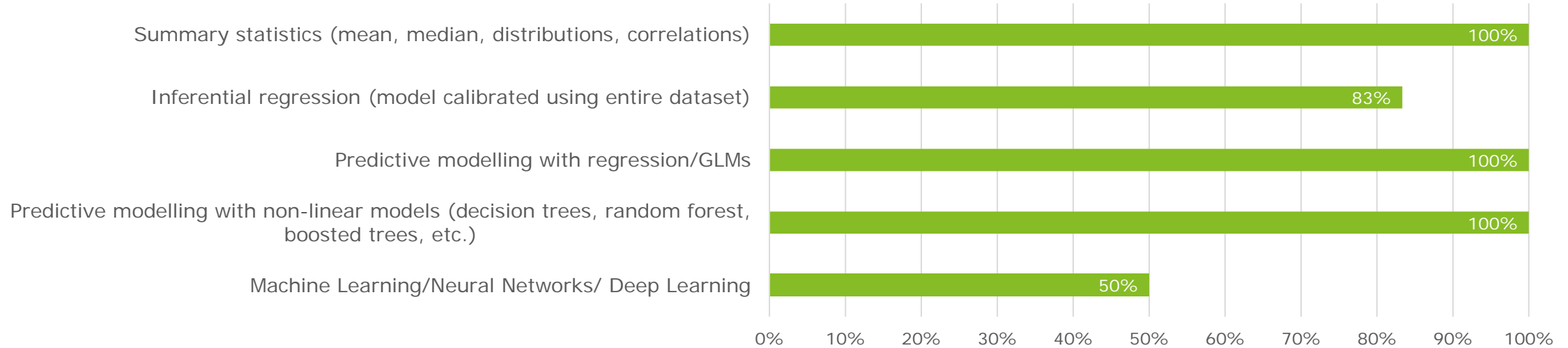
## Analysts



# Analytics Techniques

## What techniques are currently being used?

Percentage of Respondents

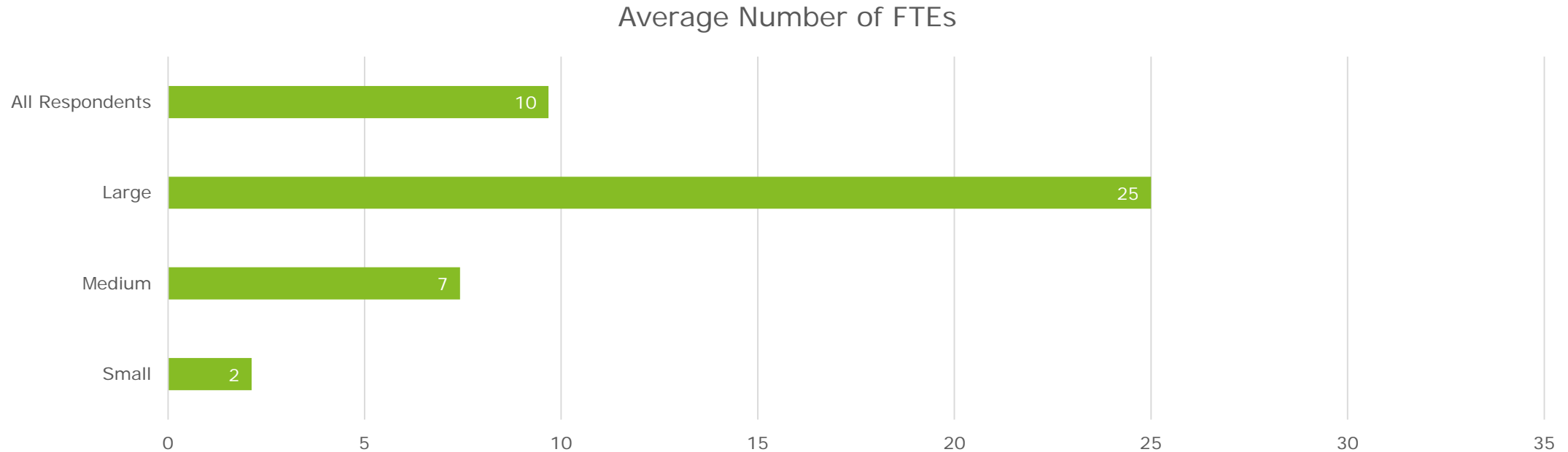


### Key Observations:

- Of those who are performing predictive analytics (this question excludes 3 respondents who have yet to perform analytics modeling at the time of this interview), all respondents indicated they are implementing summary statistics, GLM, and decision tree techniques.
- Most survey participants are using multiple approaches, with five respondents indicating all techniques.
- The least used techniques included Machine Learning/Neural Networks/ Deep Learning with only 50% of respondents using such techniques.
- The traditional approach to understanding the data is the production of some type of summary statistics, so it is not surprising that companies widely included this as part of their analytics process which also includes understanding of the data.

# Analytics Resources

How many full-time equivalents (FTE) are working on analytics?



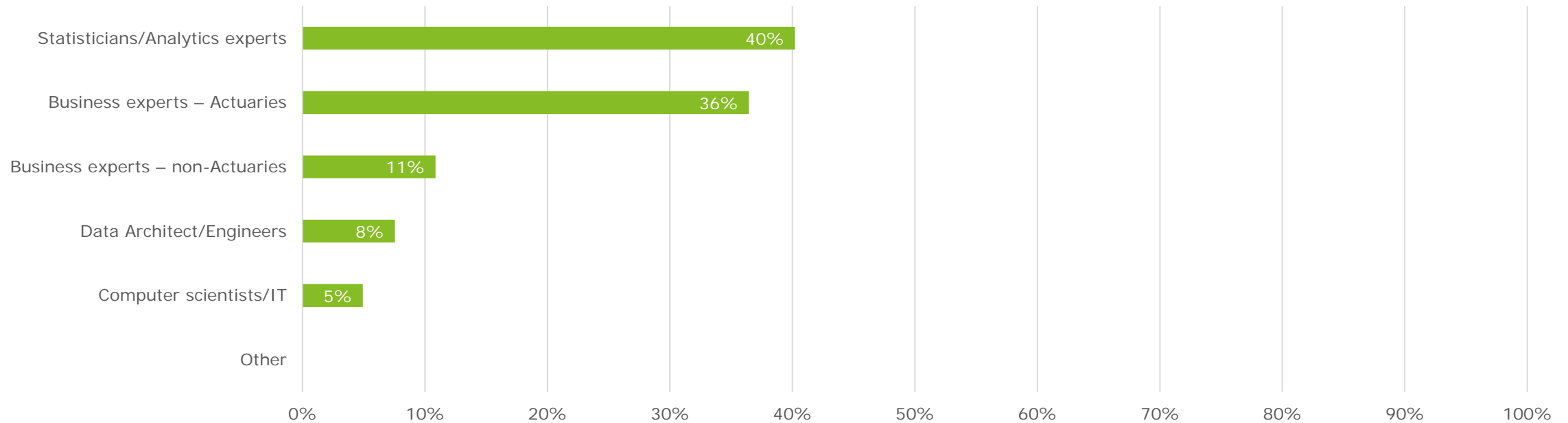
## Key Observations:

- The average FTE dedicated to working on analytics is 10, broken down into: 25 for large size respondents, 7 for medium size respondents and 2 for small size respondents.
- It is clear from the above that large size respondents have dedicated more resources to analytics, whereas some of the medium/small size respondents have not yet dedicated any.
- Respondents that are direct writers have dedicated more resources than reinsurers.

# Analytics Resources

Approximately what are the proportions of FTEs in each of the following categories?

Average Proportion – Survey Participants vs. Your Company



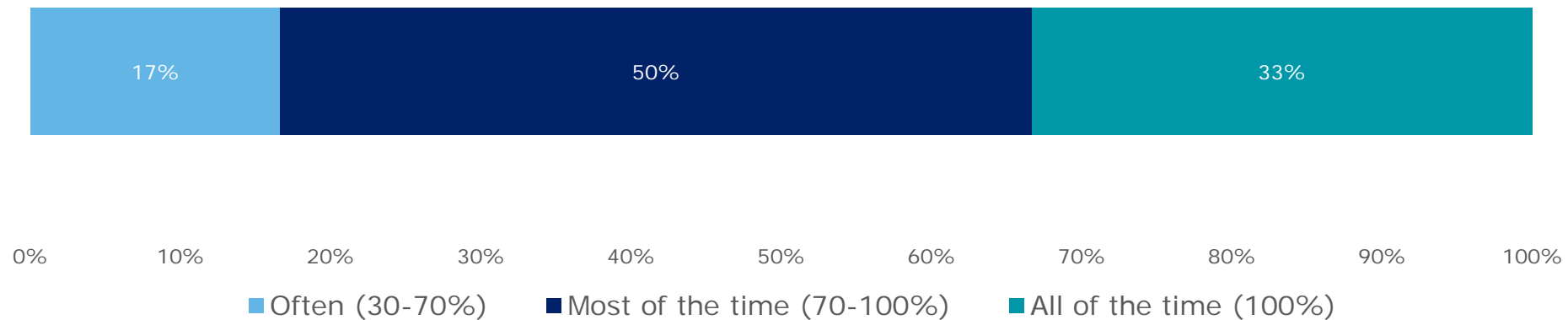
## Key Observations:

- Overall close to 50% of FTE are Business Experts as compared to Data Architects and Statisticians.
- Where Business Experts are used, approximately three quarters of them are Actuaries.
- Large size survey participants tend to use more Data Architects/Statisticians (at 78%), whereas small size participants tend to use more Business Experts (Actuarial/Non-Actuarial) (at 81%).
- Reinsurers tend to use more Business Experts than direct writers (83% vs 35%, respectively).
- Finally, limited use of Computer scientists/IT specialists is done at the time of this survey (5% of resources only).

# Analytics Resources Deployment

On each predictive analytics project, to what degree do you integrate the skillsets of Business Experts (both Actuarial & Non-Actuarial), Statistician/Analytics Experts, and IT personnel?

Percentage of Respondents

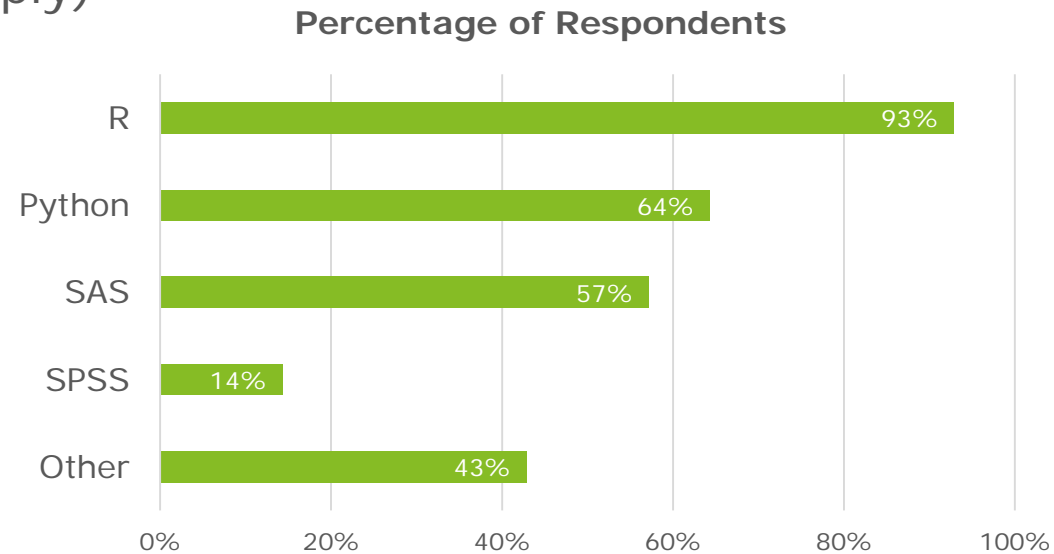


**Key Observations:**

- 33% of respondents indicated using an integrated team all the time and 50% of respondents indicated using them most of the time. This translates into 83% of respondents indicating they integrate skillsets most of the time or more.
- This leads to a better business knowledge integration and is likely to lead to higher predictive power in modelling and higher success rate in solving relevant business issues.

## Predictive Modelling Software

What software are you using for predictive modelling? (Select all that apply)

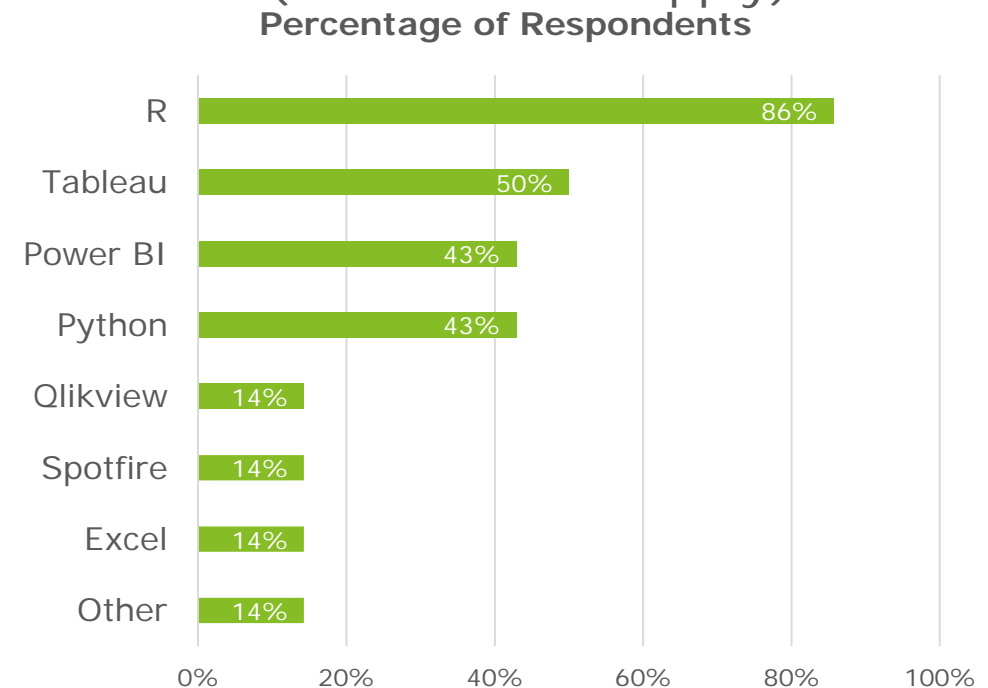


### Key Observations:

- The open-source software R holds a strong lead in popularity at 93% usage across the survey participants or 13 participants. Other popular software included Python (64% or 9 participants) and SAS (50%).
- Survey participants indicated using other software such as: Data Meer, MS Power BI, Statistica, SPSS, Matlab, and IBM Watson.
- SAS is used more by medium size survey participants than by larger size participants.

## Data Visualization Software

What software are you using for exploratory data analysis and visualization? (Select all that apply)

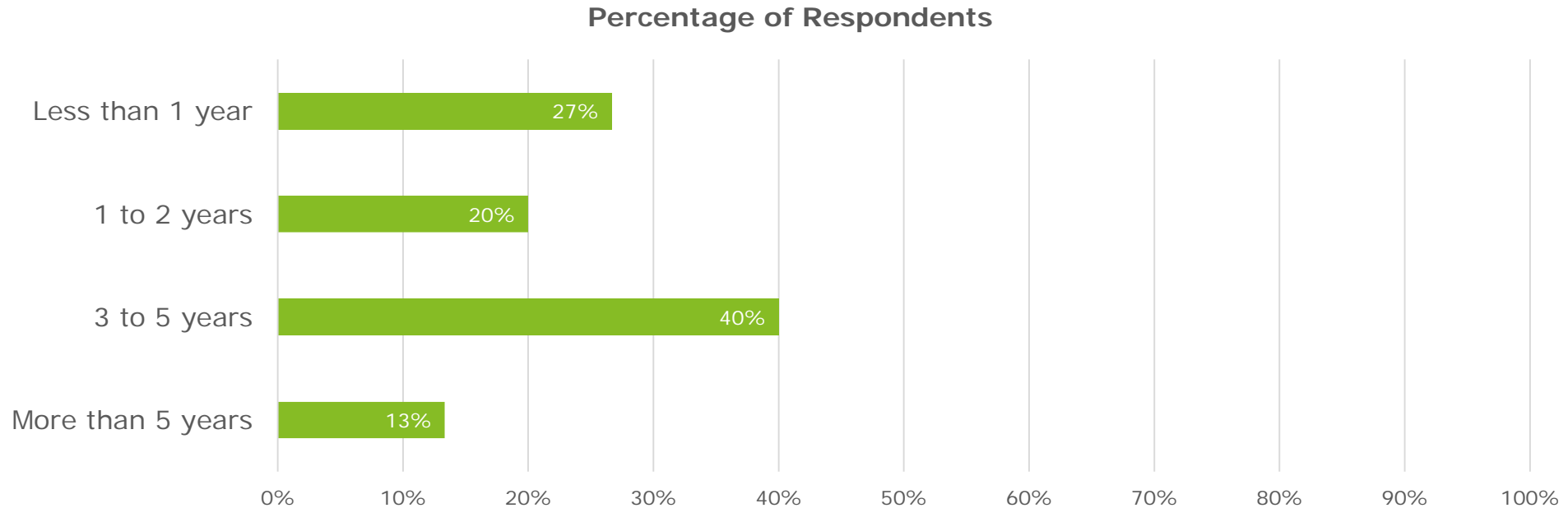


### Key Observations:

- R continues to reign as the most popular in terms of usage for analysis and visualization at 86% or 12 survey participants.
- Other popular software at the time of the survey included Tableau (50%), Power BI (43%), and Python (43%).
- Another software mentioned was SAS.

# Predictive Modelling Developments

## How long has your company been performing predictive modelling?



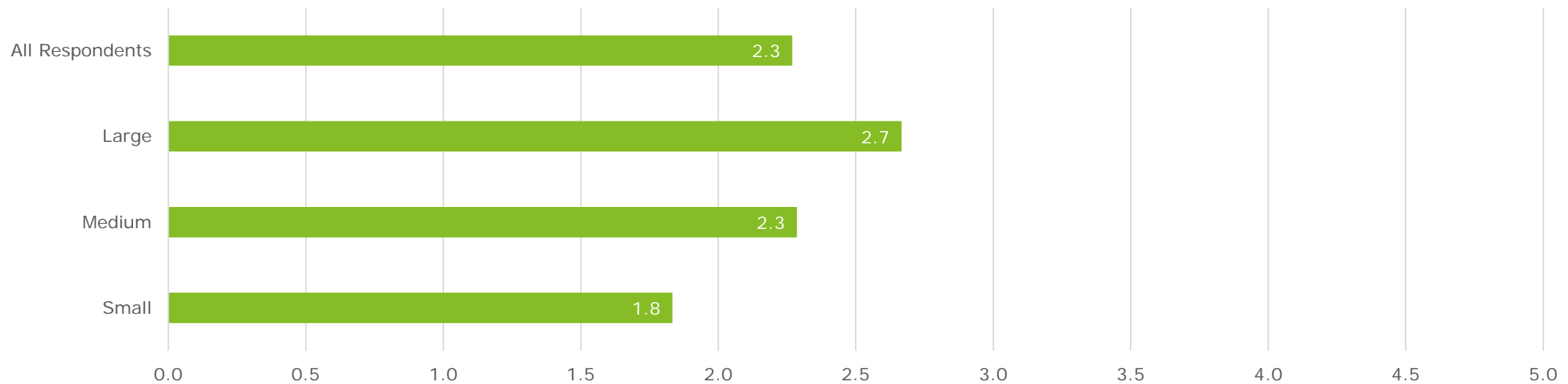
### Key Observations:

- The average number of years the survey participants have been doing analytics was 3.3 years.
- Larger size respondents tend to be performing for longer (average 4 years), and all larger size respondents have been performing more than 3 years (with 67% between 3-5 years) and (33% more than 5 years).
- None of the small size respondents have been performing more than 5 years (with 80% less than 2 years).
- These facts appear to point to higher priority of analytics being given by larger size respondents than by the respondents from other size groups.

# Analytics Talent

How difficult is it to hire and retain analytics experts for internal positions?

Average Score (out of 5)

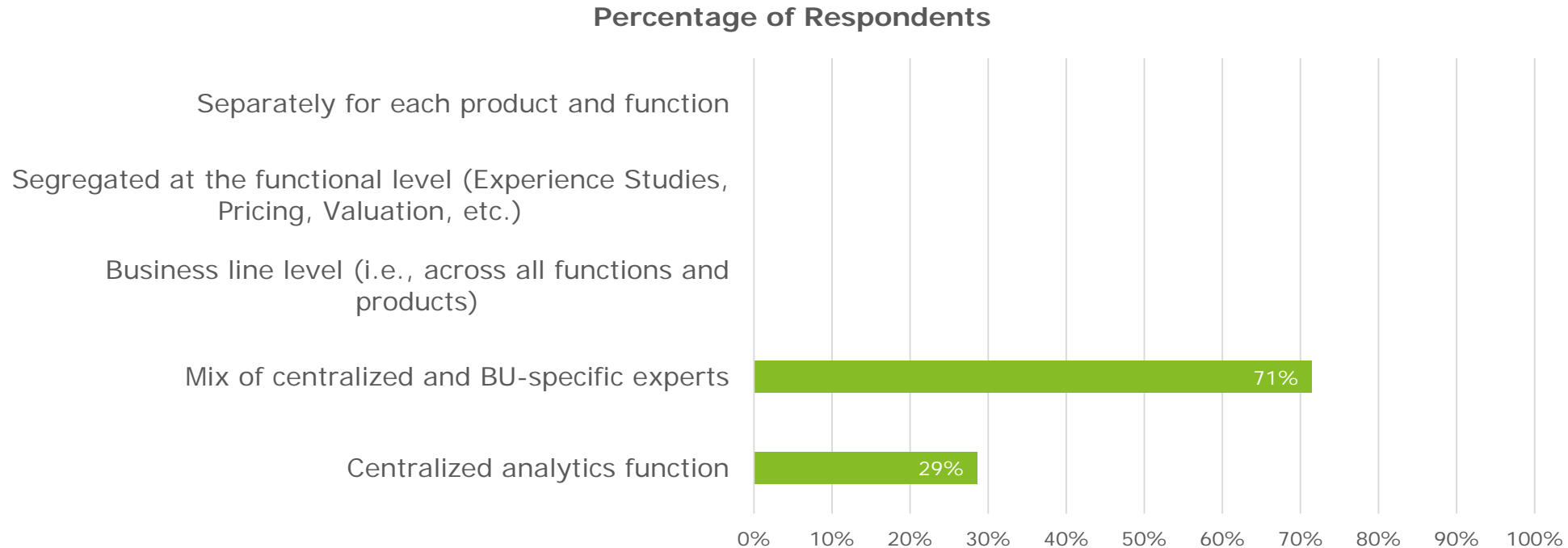


## Key Observations:

- Overall difficulty to hire and retain analytics experts score of 2.3. The general consensus is that it is moderate/difficult to find talent for predictive modelling.
- It is observed to be easier for larger size respondents to hire than smaller size respondents.
- Many participants indicating that it is harder to hire the right people (with the correct balance of technical abilities and business knowledge) than it is to retain them.
- Although it was not the case for large size survey participants, a few respondents indicated difficulties to hire experts.

# Analytics Capabilities

How are analytics capabilities organized throughout your organization?



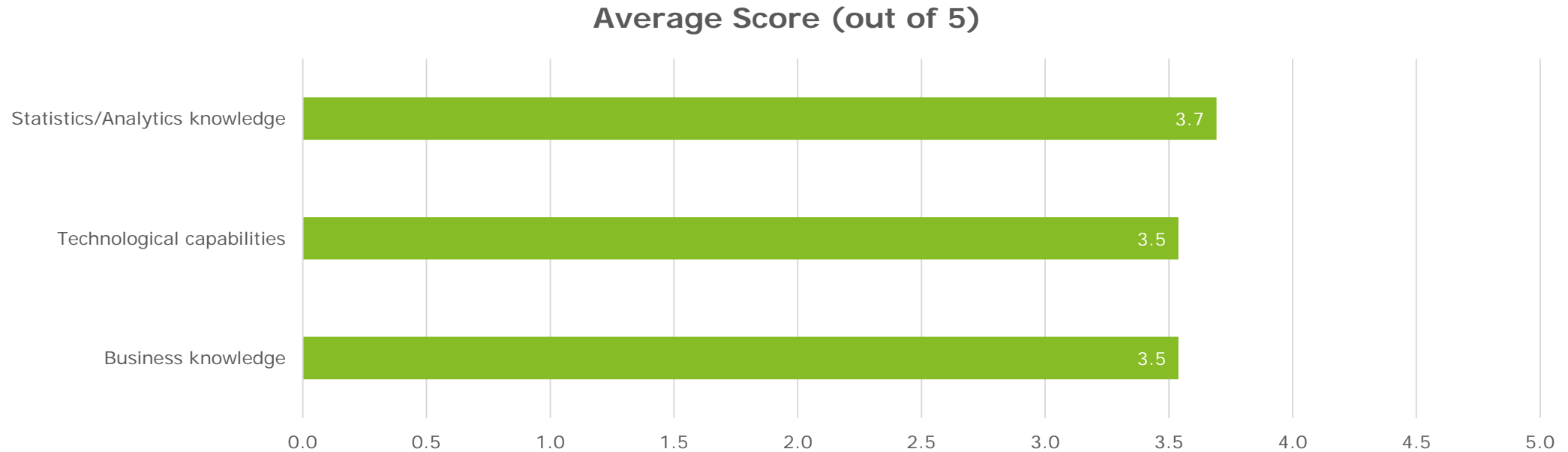
## Key Observations:

- 71% of respondents indicated using a mix of centralized and BU-specific (specialists in decentralized groups) experts and 29% indicated using a centralized function.
- No significant difference was noted between size groups.
- Reinsurers tend to be more centralized than direct writers.
- It doesn't appear that there is much segregation in the analytics functions for the survey participants. It is worth noting that even though the data was indicated as highly segmented, the analytics function is not.



# Analytics Talent

How would you rank the following aspects of your analytics talent?



## Key Observations:

- Overall the analytics talent was assessed with score of 3.5 for technical capabilities, 3.7 for analytics knowledge and 3.5 for business knowledge.
- Larger size respondents tend to have better scores with 4.3, 4.7 and 3.3 respectively.
- While large size and medium size respondents assessed the business knowledge lower than other aspects, the small size respondents assessed their technological capabilities lower than their Business knowledge.
- For large and medium size companies, this may indicate the need to invest in training analytics talent about the business or hiring business-minded people with analytics capabilities.
- For small size companies, this may indicate the need to invest in technology and related training.

# Summary Results

# Overall survey findings

## Data

- Data is viewed as imperfect (completeness and accuracy)
- Data is highly segmented/ decentralized
- Most respondents don't have a centralized data repository with more than 2/3 do not have centralized data of any form
- The proportion of the data that is centralized is less than 1/5 of all data owned
- There is a fair use of external data by the industry

## Enterprise

- Focus of governance has been placed on data
- 2/3 have governance/policies around predictive modeling and the remaining 1/3 perform minimal predictive modelling work
- Only 1/3 have governance/policies regarding evaluation metrics for model performance
- 1/3 had no governance/policies in place regarding software and technology used in analytics processes

## Leadership

- 60% of respondents have both an executive responsible for data and an executive responsible for analytics
- Aside from large and medium size respondents, analytics is not placed at highest priority and therefore analytics initiatives do not have strong support from leadership

## Targets

- Highest priority applications included: simplified underwriting, fraud detection, targeted marketing, inforce retention management
- Medium priority applications were identified as: new customer segmentation, application triage/accelerated/automated underwriting, cross-selling/up-selling, pricing, inforce segmentation, lapse experience studies, operational efficiencies, claims management optimization
- Other-than large organizations most have gaps in types and breath of applications (for marketing, retention management, distribution-client matching, accelerated/automated underwriting)
- Most respondents have explored/plan to explore use in experience studies
- Most have not thought about use in the context of improving internal operations

## Analysts

- Only 1/2 of the respondents explored advanced models such as machine learning/ deep learning approaches
- Many are struggling to hire people with the right skillset: strong technical ability, strong business knowledge and good communicators
- Actuaries are well-positioned to expand their technical knowledge to cover predictive analytics and applications

## Overall survey findings

- Overall, the participants were assessed at an intermediate maturity level
- Wide range across participants and the highest scoring participants:
  - Have explored many potential analytic applications
  - Have full support and prioritization from leadership
  - But acknowledged still having room for improvements on data aspects

### Areas for development:

- Improve on the quality and breadth of the data
- Improve on the co-ordination of resources, and
- Develop formal policies and governance around analytics processes
- Explore further use cases

Questions?