The creation of exploration data is expected to increase 44 times to 1.2 million petabytes – or 1.2 zettabytes – by the end of this year. A petabyte is the equivalent of a stack of DVDs stretching from here to **the moon**.

-IDC and EMC Corporation
April 2010

Exploration Information Management Survey

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Introduction

During November and December of 2010, Geosoft set out to build insight into how C-level executives from different organization involved in Mineral Exploration viewed Exploration Information Management. Our approach was to construct a simple survey of 8 questions that would allow us to gain insight into:

- What are the key Data and Information management challenges.
- Who is involved in managing and impacted by these challenges.
- How would you approach solving these issues.
- What impact would solving these issues have on their organization.

The survey was delivered to over 100 organizations around the globe. The only pre-qualification to organizations surveyed was that they could not be using a data management solution from Geosoft. The Survey was directed to C-level executives from exploration companies, government organizations and service companies that are involved in gathering data for mineral exploration companies. In total we received responses from 35 organizations with the following distributions.

Survey Statistics

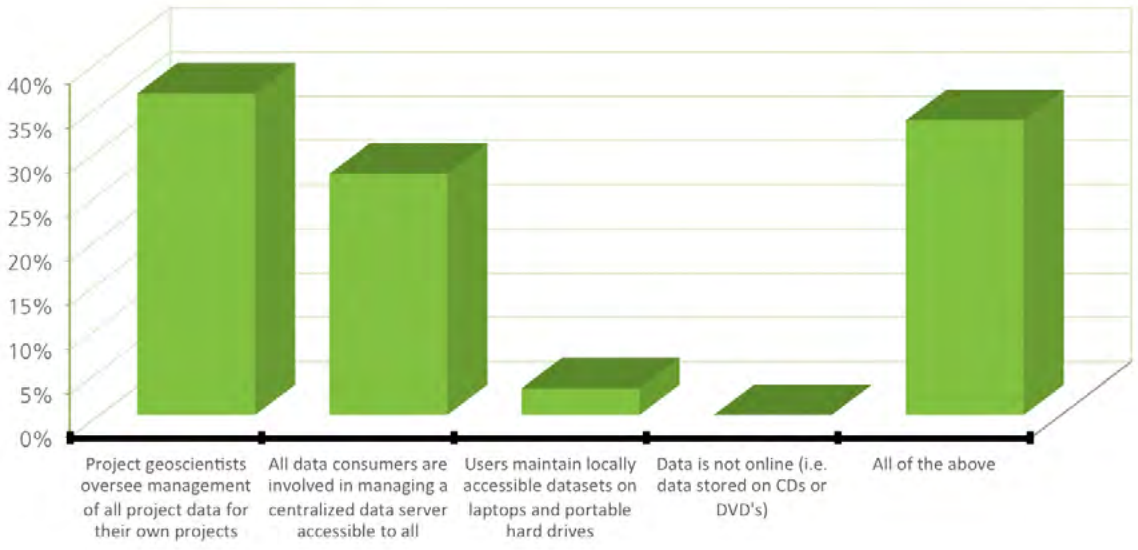
Response by Title	%
President/VP/CEO/Executive	28%
Director/Manager	28%
Geoscientist	25%
IT/GIS Specialist	16%
Other	3%

Response by Region	%
North America	42%
Latin America	15%
Europe / Middle East	18%
Africa	12%
Australia and Asia Pacific	12%

1. How are your geophysical and other geoscientific data currently managed, primarily?

a. Project geoscientists oversee management of all project data for their own projects.
b. All data consumers are involved in managing a centralized data server accessible to all.
c. Users maintain locally accessible datasets on laptops and portable hard drives.
d. Data is not online (i.e. data stored offline, on CDs or DVD's).
e. All of the above.
f. Other (please specify).

Project geoscientists oversee management of all project data for their own projects	33%
All data consumers are involved in managing a centralized data server accessible to all	30%
Users maintain locally accessible datasets on laptops and portable hard drives	3%
Data is not online (i.e. data stored on CDs or DVD's)	0%
All of the above	33%



Respondents that answered how their companies managed their geophysical and other geoscientific data broadly fell into two camps. One third of the companies rely upon their Geoscientists to oversee the management of their project data. Another third of the companies relied upon a centralised data repository approach. No companies responded that they relied upon offline or "physical medias" such as dvd's and less than 5% of those surveyed believe that their end users predominantly manage data on laptops and portable hard drives.

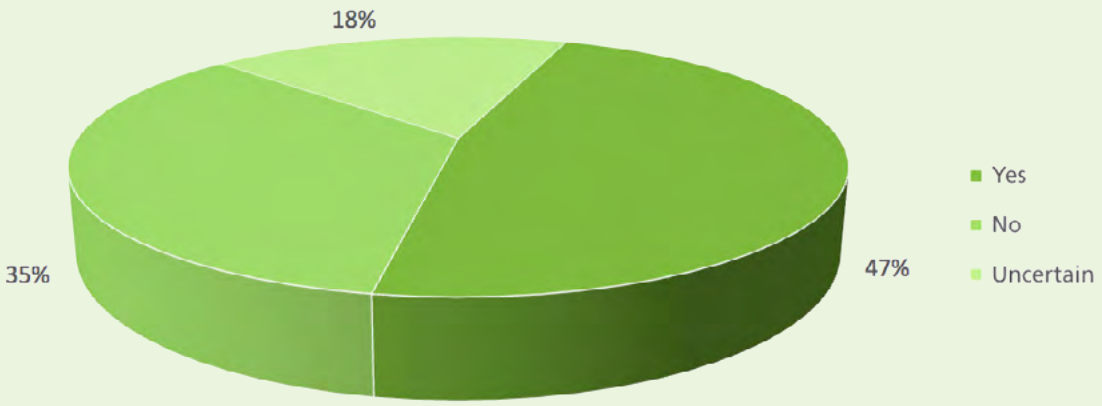
The remaining third recognised that all of these approaches where in use within their organization. These organizations tended to identify with the fact that their geoscientist spent too much time on data management compared to interpreting data.

Correlating these results to other answers within the survey;

- The move to centralizing data management reflects an ongoing trend within the industry. Those companies that have committed to a centralization strategy commented they have typically put in place data managers or data custodian roles to oversee the centralised data stores.
- Companies that centralize, but do not have a data custodian role, struggle with the availability of key resources so that others have access to the data to others.
- Of interest, those that expect their Geoscientists to manage their own data, showed little concern around the time that these geoscientists put to this task (question 3). This is at least a consistent philosophy.

For context, similar challenges are faced by the Petroleum exploration industry. In a recent study under taken by Wipro[1], they identified that approximately 50% of the surveyed Oil and Gas companies have designated Data stewards or Owners.

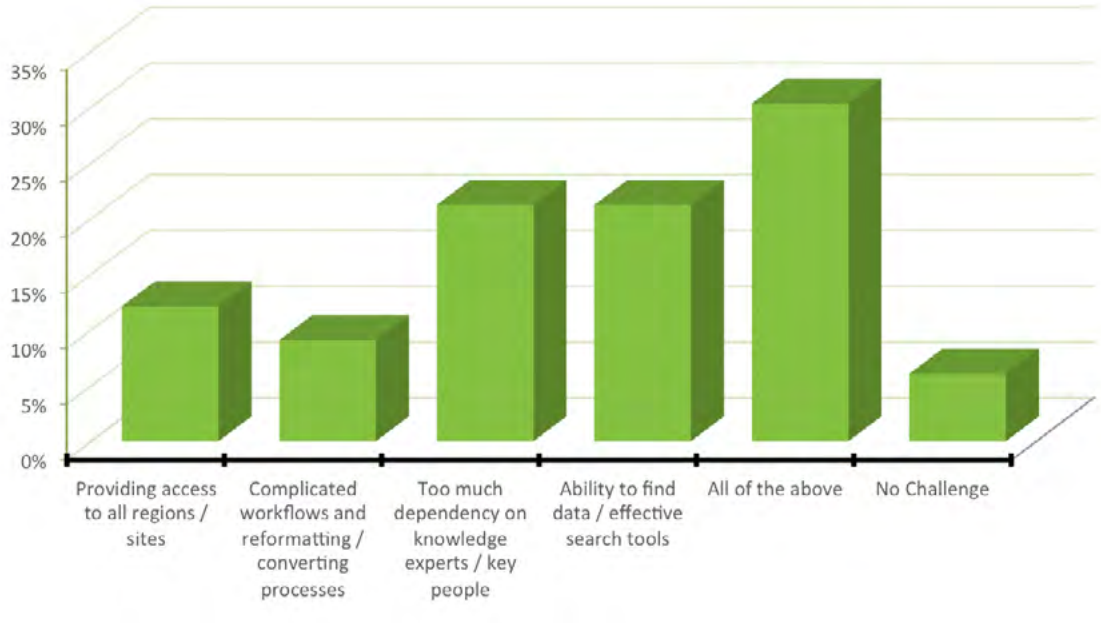
Does your organization have named Data Stewards for "important" Upstream Data?



2. What is your biggest challenge with managing your exploration data?

a. Providing access to all regions / sites.
b. Complicated workflows and reformatting / converting processes.
c. Too much dependency on knowledge experts / key people.
d. Ability to find data / effective search tools.
e. All of the above.
f. Other (please specify).

Providing access to all regions / sites	12%
Complicated workflows and reformatting / converting processes	9%
Too much dependency on knowledge experts / key people	21%
Ability to find data / effective search tools	21%
All of the above	30%
No Challenge	6%



The consensus of those companies surveyed was that there are multiple challenges in managing Geophysical and Geoscientific data. 30% of the companies identified multiple challenges existed with managing their exploration data. Those that identified specific challenges chose dependency on knowledge experts and ineffective search tools as their primary concerns.

Only 6% of the companies surveyed identified that they had no data management challenges. These companies identified through their comments specifically mentioned working with third parties and consultants to implement a solution to solve their data management challenges.

How successful are "data searchers"?

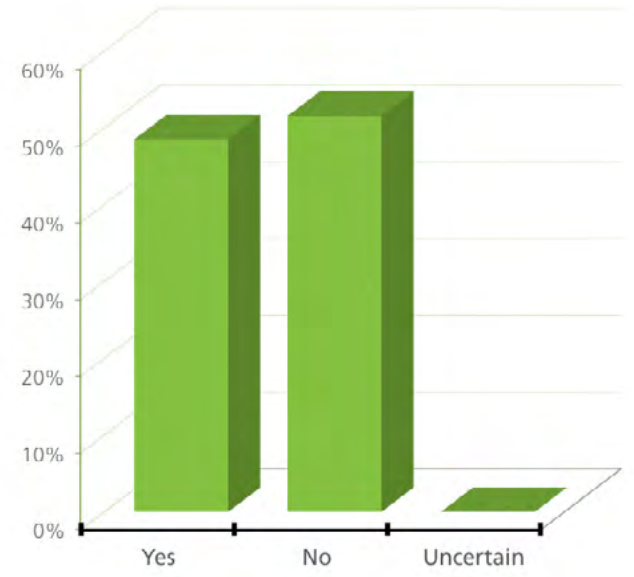
- Studies have shown "data searchers" can spend from 15% to 35% of their time searching for information.
- Data searchers are successful in finding what they seek 50% of the time or less.
- Only 21% of data searchers find the information they needed 85% to100% of the time.
- 40% of corporate "data searchers" report that they cannot find the information they need to do their jobs.

*Source: **Susan Feldman**, Research Vice President, Search and Discovery Technologies, IDC. Susan Feldman directs IDC's Content Technologies Group, and specializes in research on search and discovery software and digital marketplace technologies and dynamics.

3. Do you agree the 'average' geoscientist spends more of his/her time working on data management tasks that on interpreting the data?

a. Yes, too much time, they need to spend more on interpreting.
b. No, this not a concern for us.
c. Don't know and don't care.
d. Other (please specify).

Yes	48%
No	52%
Uncertain	0%



On this question our survey respondents were equally split between those that felt their Geoscientists were spending too much time on data management tasks versus those that did not see this as a concern.

There is an often quoted position[1] that, at least within the Oil and Gas Industry that "Upstream professionals" spend almost 70% of their time on the job search for the best available information. Other surveys such as the already quoted, Upstream Data and Information Management Survey for the Oil and Gas industry conducted by Wipro shows that this statistic seems to be over inflated. Though this is a hard metric to analyse, the respondents in this survey indicated that 52% of their Geoscientists spent on average >30% of their time on "Lower Value" activities like looking for, accessing, cleaning or preparing data.

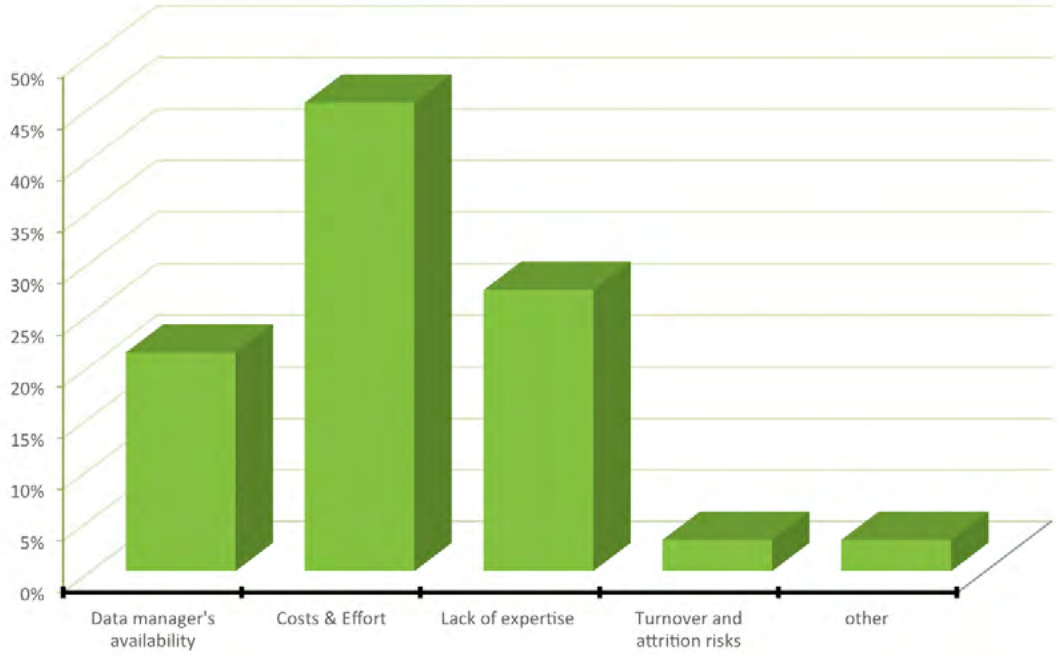
Whatever the actual statistic of time spent on lower order data management tasks performed by Geoscientists, increasing the time available to Geoscientists to perform the higher value activities such as analysis and interpretation still represents low hanging fruit available to most organizations in times of shortages of trained professionals.

[1] "Upstream professionals spend almost 70% of their time on the job search for the best available information from the data they have access to". Source: David Shipman, IBM (presentation at 2008 Digital E&P Conference).

4. Of the following concerns, which is the most important to you when thinking about maintaining any data management solution?

a. Data Manager's availability.
b. System, database and service maintenance costs / effort.
c. Lack of expertise (i.e. lack of skills or confidence) in operating an information system .
d. Turnover and attrition risks.
e. Other (please specify).

Data manager's availability	21%
System, database and service maintenance costs / effort	45%
Lack of expertise or skills in operating an information system	27%
Turnover and attrition risks	3%
Other	3%



When considering how companies maintain their data management solutions, most respondents focused first upon the costs associated with maintaining these solutions. After cost, the availability of Key resources was seen to be the challenge.

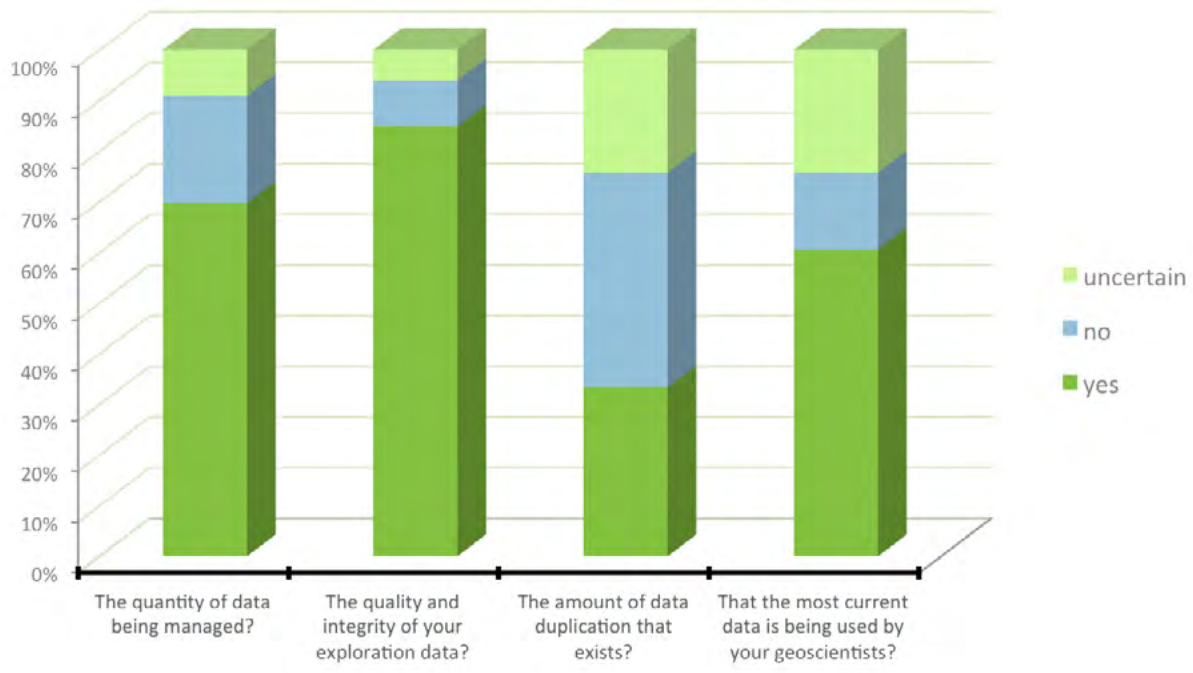
Several respondents commented on the fact that we did not include an option on this question related to the Quality Control and Auditing. This theme was reviewed within a subsequent question; however it would be an interesting topic to consider when thinking about the "Maintainability of a Data Management solution". In future surveys we will consider how to incorporate this into our Survey.

The fact that many respondents see a lack of data management resources within their organizations as a challenge raise the question around whether outsourcing aspects of data management represents an alternative path for many organizations. Interestingly, none of our surveyed companies saw this course of action as a path they would venture down (see question 6).

5. Given the many different exploration datasets within your company, do you feel confident that your organization has a handle on:

a. The quantity of data being managed?
b. The quality and integrity of your exploration data?
c. The amount of data duplication that exists?
d. That the most current data is being used by your geoscientists?

	yes	no	uncertain
The quantity of data being managed?	70%	21%	9%
The quality and integrity of your exploration data?	85%	9%	6%
The amount of data duplication that exists?	33%	42%	24%
That the most current data is being used by your geoscientists?	61%	15%	24%



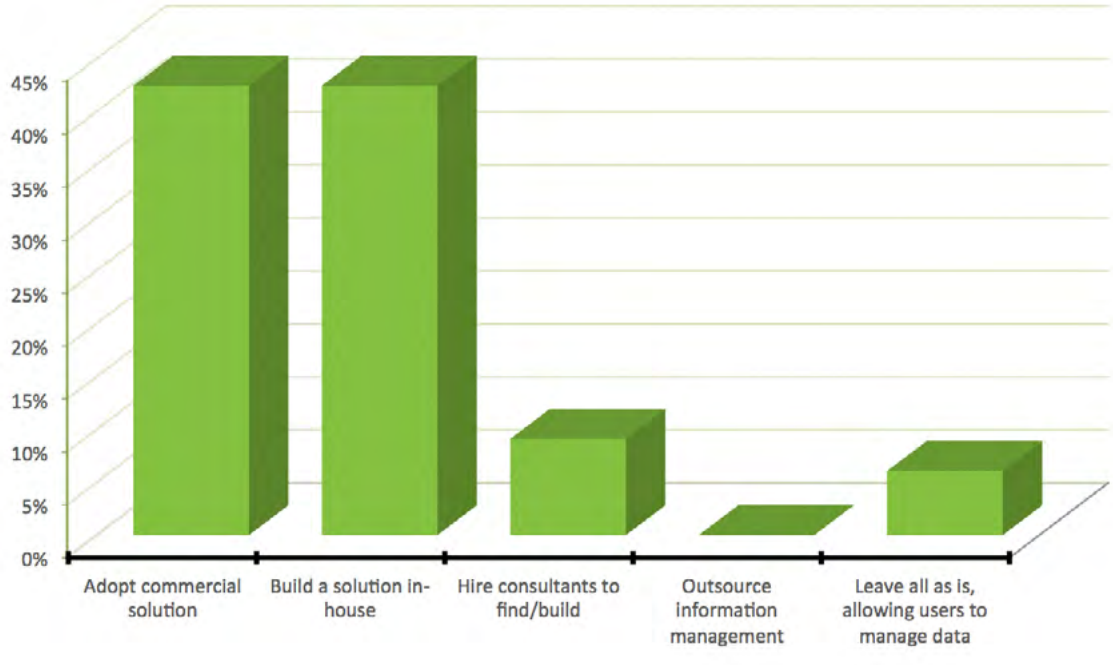
The survey results indicate most companies felt they had a control over the total volume of exploration data under "management" and that they had good control of the quality of their exploration data. The area of bigger concern lies in the amount of duplicated data and whether the most current data is been used by Geoscientists within their interpretation.

The fact that data duplication was seen to be an area of concern is supported by trends within other similar industry segments. The application of Data Deduplication solutions within the Exploration Data management for the Oil and Gas industry has grown substantially over the last five years, in part due to the recognition that costs related to duplicated data are rising. Similar anecdotal information has been gathered within a large mineral exploration company that suggests between 30 – 40% of their exploration information "under management" may actually be duplicated. As an industry, we may be arriving late to the table, but opportunities exist to take up these existing solutions and approaches to gain benefits rapidly.

6. What would be your preferable approach to solving your exploration data management challenges?

a. Acquire a single commercially-available platform.
b. Build a solution in-house.
c. Hire consultants to find an integrated solution or architecture.
d. Outsource Data management to an external service group.
e. Leave all as is, allowing users to manage data.

Acquire a single commercially-available platform	42%
Build a solution in-house	42%
Hire consultants to find an integrated solution or architecture	9%
Outsource Data management to an external service group	0%
Leave all as is, allowing users to manage data	6%



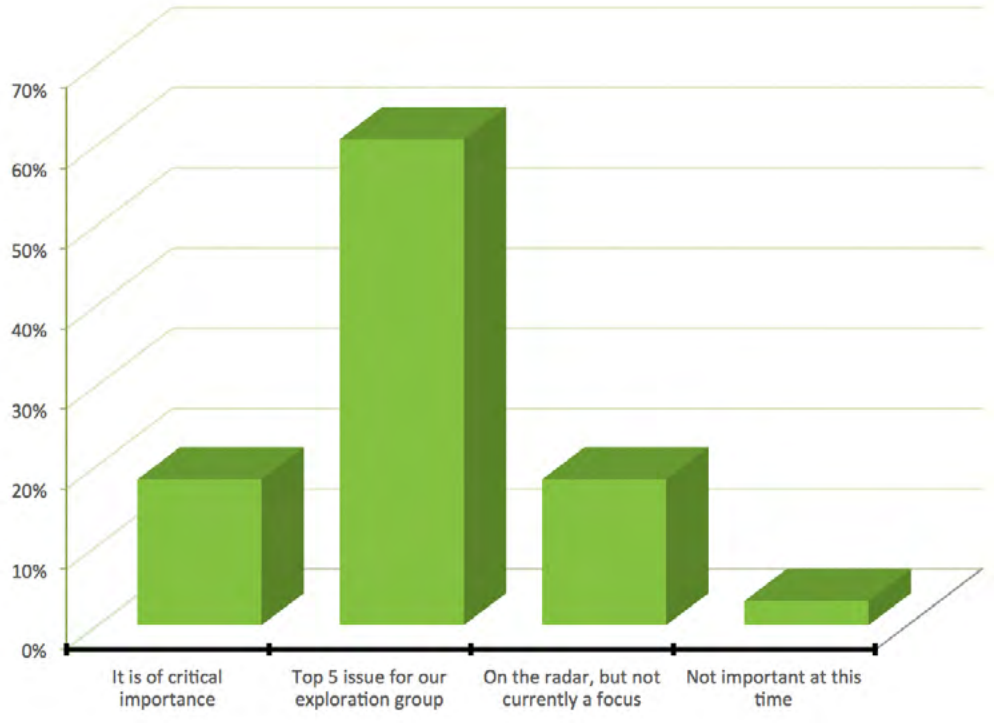
The survey respondents split fairly evenly into two camps. The first favoured the acquisition of a commercially available solution or platform. There is a correlation (60%) within these respondents for concerns around the cost of maintaining the solution going forward. Likewise the 42% of respondents that favoured building an in-house solution, correlated to those that had concerns around the availability of key resources.

Of interest, no respondent indicated they would consider outsourcing of Information management. This suggests that at this time, none of the respondents perceive there to be a valid provider of these services or that the challenges could not be resolved through outsourcing.

7. For your organization, where would "data management" rank as an issue?

a. It is of critical importance.
b. Top 5 issue for our exploration group.
c. On the radar, but not currently a focus.
d. Not important at this time.

It is of critical importance	18%
Top 5 issue for our exploration group	61%
On the radar, but not currently a focus	18%
Not important at this time	3%

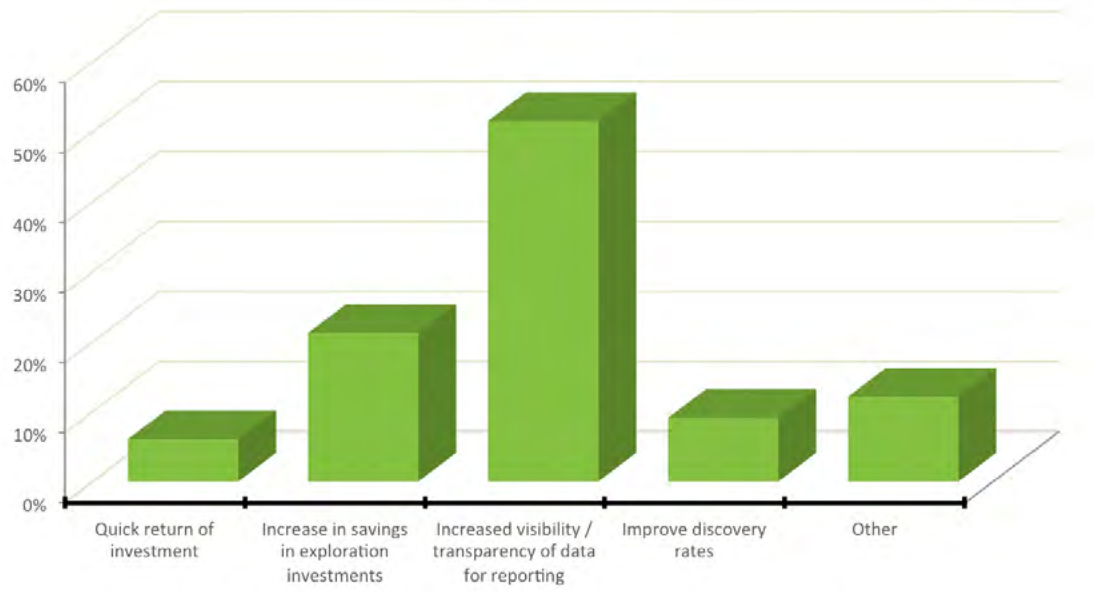


Of the survey respondents, 79% described Exploration Data management as either Critical or Ranking within the Top five issues faced by the Exploration Group. There exists a strong correlation between those respondents that ranked the issue of Data Management as critical with those that identified Sharing data between regions as the biggest challenge faced by their organization.

8. What is the most important outcome that you would expect from resolving data management and accessibility issues?

a. Quick return of investment.
b. Increase in savings in exploration/assessment investments.
c. Increased visibility/transparency of data for reporting and investment attraction.
d. Improve discovery rates.
e. Other (please specify).

Quick return of investment	6%
Increase in savings in exploration / assessment investments	21%
Increased visibility / transparency of data for reporting and investment attraction	52%
Improve discovery rates	9%
Other	12%



Of the companies surveyed, the most important return expected from an investment in a Data management solution revolves around increasing the use and access to data. Irrespective of whether the respondent was from an exploration companies, government organizations or service companies that are involved in gathering data for mineral exploration companies, all saw the most value coming from increased access and availability of their data Assets.

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