The Need of the Hour: Moving from Risk Management to Stress Testing of Projects

Theme: Overcoming challenges & complexities in Project Management

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Key Words: Stress Testing, Crisis Management, Risk Management

Abstract

As the complexity of project grows, Project Managers will face a daunting task of managing frequent crisis situations in the project life-cycle. This calls for an innovative approach for managing crisis beyond the traditional risk management framework. Stress testing is a robust methodology that bankers periodically use to analyze the impact of key risk scenarios, on the bank's financial health, by simulating crisis situation. Project Managers in banks have evolved innovative techniques to do periodic stress testing leveraging new age technology e.g. Big Data. The learnings can be adopted in large scale programs in other fields to effectively monitor project health, reduce project risks and handle project crisis situations proactively and more effectively.

The paper discusses a framework for Project Managers to do periodic stress testing of large programs. The key points discussed are:

- How to define stress scenarios for the program
- How to conduct periodic stress testing
- How to analyze the stress testing results and take preventive measures

The paper draws from our experience in executing complex regulatory projects for large banks to manage crisis reporting and stress testing. While risk management is a standard project management practice, it's more of a postmortem we do after a crisis has happened. Stress testing is the next evolutionary stage of risk management and the need of the hour. The framework discussed in the paper is easy to adopt, practice and will help decrease project risks in times of crisis, a key enabler to the success of Vision India.

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Introduction

Traditional risk management practices like risk reporting, Business Continuity Planning (BCP) and Disaster Recovery (DR) have been around in Project Management for years, including in banks. However, it didn't prevent the near collapse of World Economy during the Lehman Brother crisis in 2008. Banking industry, especially the financial regulators like Basel Committee on Banking Supervision (BCBS), Prudential Regulatory Authority (PRA) in UK and Federal Reserve in USA realized the further need to strengthen banks' Business and IT risk management processes to prevent a repetition of what took place in 2008. This saw a number of regulations around risk management being formulated and implemented. BCBS 239 (Principle number 239 laid down by BCBS) is one such global regulation that lays down the principles that a bank should follow for risk data aggregation and reporting. One key focus area for the financial regulators within the bank's risk management practices is that of stress testing and crisis reporting.

Indian banks have been a little behind in adopting some of the latest global regulatory policies, as against their developed international counterparts. The recent turmoil in the banking sector like the one with Non-Performing Assets (NPA) which played havoc in most of the bank's balance sheet in Q1 FY2016 and created quite a turmoil in the market, has led to a fresh impetus in strengthening their risk management practices, especially stress testing and crisis reporting. The paper not only discusses how stress testing and crisis reporting best practices can be adopted in Indian banking scenario, by leveraging new age technology, but also goes beyond and defines a framework on how it can be adopted in other industries in India. PMs have a very crucial role in driving this initiative in their programs and organization. To drive Vision India, we PMs need to strengthen our processes to mitigate risks during emerging crisis scenarios.

The Need for Stress Testing and Crisis Reporting

Many PMs associate crisis management with Business Continuity Planning and Disaster Recovery. While BCP aims to ensure essential business functions continue to operate after a disaster, DR provides a roadmap for the underlying technology infrastructure to recover post the disaster. BCP can act well only when we know beforehand what disaster will strike and how it will impact the project. However, with emerging complexity of crisis situations nowadays, the traditional BCP approach will not help the PMs mitigate all program crisis situations in the future.

A recent example where most PMs handling risk management in multinational banks faced was 'Brexit' (Exit of Britain from EU). Days before UK was to vote on the referendum, no one in banks had an understanding of how the referendum would take shape and its impact on the banks. 'Brexit' had the potential of becoming a Lehman Brother type crisis situation. PMs, handling key banking initiatives were clueless on the looming crisis, for example, if 'Brexit' takes place the impact on the bank's operation risk, the fluctuation in UK Pound currency price in coming days and its impact on the bank's market risk. It was not possible to factor in all scenarios and prepare a holistic BCP plan. Given the limitations and uncertainties of the approach that most banks, with the help of their project management teams, took was to strengthen their crisis reporting and stress testing process. This enabled bank managers to receive accurate and timely information on various financial parameters on the eve of 'Brexit' and take all corrective and informed decisions to sail the bank out of a probable crisis. 'Brexit' did happen and thanks to the effort of the PMs in mitigating the risk, the banks managed to survive the crisis.

A crisis situation like 'Brexit' will continue happening, not just in banking but also in the other industries. Indian industries are especially vulnerable to new and complex crisis situations. Some likely examples in the Indian scenario can be:

a) Automobile Industry: Supreme Court suddenly banning all diesel vehicles citing carbon emitting norms
b) Real Estate Industry: Government of India suddenly passing stringent ordinances unfavorable to real estate developers
c) Healthcare Industry: Sudden outbreak of a calamity (For example, the devastating Chennai floods of 2015 where reportedly many patients died in the hospital's ICU due to power outage)

To conclude, it is essential for the PMs to adopt stress testing and crisis reporting in particular across industries. The framework for managing stress testing and crisis reporting can be developed at an organization level or at a program level (for large and strategic programs within organization). In this paper, we will discuss the concept of developing the framework at an organization level and the crucial role of PMs in ensuring its success. The same framework can be implemented at a program level, if required, with the required customizations. However, the basic principles and components of the framework will remain the same. Unlike banks, in most industries crisis reporting is more apt than stress testing though both can run on the same framework. For the benefit of our non-banking PMs, we will discuss the framework keeping the crisis reporting as a base.

Components of the Crisis Reporting Framework

As discussed earlier, crisis reporting differs from traditional risk reports in a way that during crisis, mostly the PMs are unaware of the decisions to be taken. It all depends on how the crisis unfolds, which is an unknown variable. Thus, Crisis reporting enables the availability of specific data to the bank mangers (decision makers) during crisis, in a timely and an accurate manner to enable them in making the right decisions to sail through the crisis. In traditional risk reporting, the PMs have an idea about the outcomes and the decisions to be made.

Table 1 lists the three components involved in building a framework to support crisis reporting. This framework is based on our project management experience in crisis reporting and regulatory reporting projects for leading global banks.

Component	Description
People	This involves the PMs, Domain Experts, and Technical Experts who will govern and execute the framework
Process	• Governance structure and operating model • Process to be followed during crisis reporting • Principles and standards to be adopted across the framework
Technology	Underlying technology infrastructure for example, Big Data, various tools that will help in data aggregation and reporting across the framework

Table 1: Framework Components

Table 2 lists the principles that are highly recommended for the PMs to apply while laying the foundation for the framework.

Principle	Implications to framework
Strong Governance	While having robust processes and technology to support the framework, a lack of effective and strong governance structure around the framework can hinder in achieving the desired benefits
Robust Data Architecture	Information is the backbone of the framework as the managers require to take

	decisions based on the data made available through the framework during times of crisis. Therefore the framework should be supported by a robust data architecture (for example, data repositories, reference data management and so on)
Effective Data Quality Control	Each component of the framework needs to follow stringent data quality check. Some data quality principles that are to be ensured during the end-to-end processing of data in the framework are accuracy, integrity, completeness, comprehensiveness, clarity, usefulness, and timeliness of data.

Table 2: Governing Principles

The following are the three components of the framework

1. People

Crisis reporting should ideally be set up under the risk management department of the organization. A well-defined governance body should be defined which should own the entire framework. It should be headed by a competent authority (preferably a senior Program Manager) as it involves coordination between various departments. There should be an able representation of PMs across key projects and senior management. The representation will vary based on the departments from which the data needs to be sourced. For banks, it will involve PMs from each risk reporting unit, for example, Operation Risk, Market Risk and so on. The structure will also vary based on the industry and internal organizational structure. Some other key representatives in the governing body can be:

- Business Analyst or Process Consultant: To analyze, suggest and process modification in the due course of time
- Enterprise Architect: To ensure that the solution is adhering to laid Enterprise principles and standards
- Infrastructure Lead: To provide recommendations to support the solution in the most optimal way

2. Process

When it comes to process, there are the following two types of processes that need to be defined within the framework:

i. Overarching process: This should be an annual exercise to review the framework and update supporting artefacts, to do a mock drill of the existing processes and identify and close any gaps in the framework. Defining the overarching crisis reporting process for the first time can be a time consuming activity. Once defined, it just needs to be revised once a year to ensure that the process is up-to-date based on the changing business and IT scenarios of the organization.

ii. Actual Process: This process will be followed in case of a crisis. For instance, during a crisis, the responsible associate who will trigger the crisis reporting, the role and responsibilities of various stakeholders, and so on. This process is well defined as part of the mock drill process under the 'Overarching Process' and hence we will not separately elaborate it.

<u>Overarching Process Steps</u>

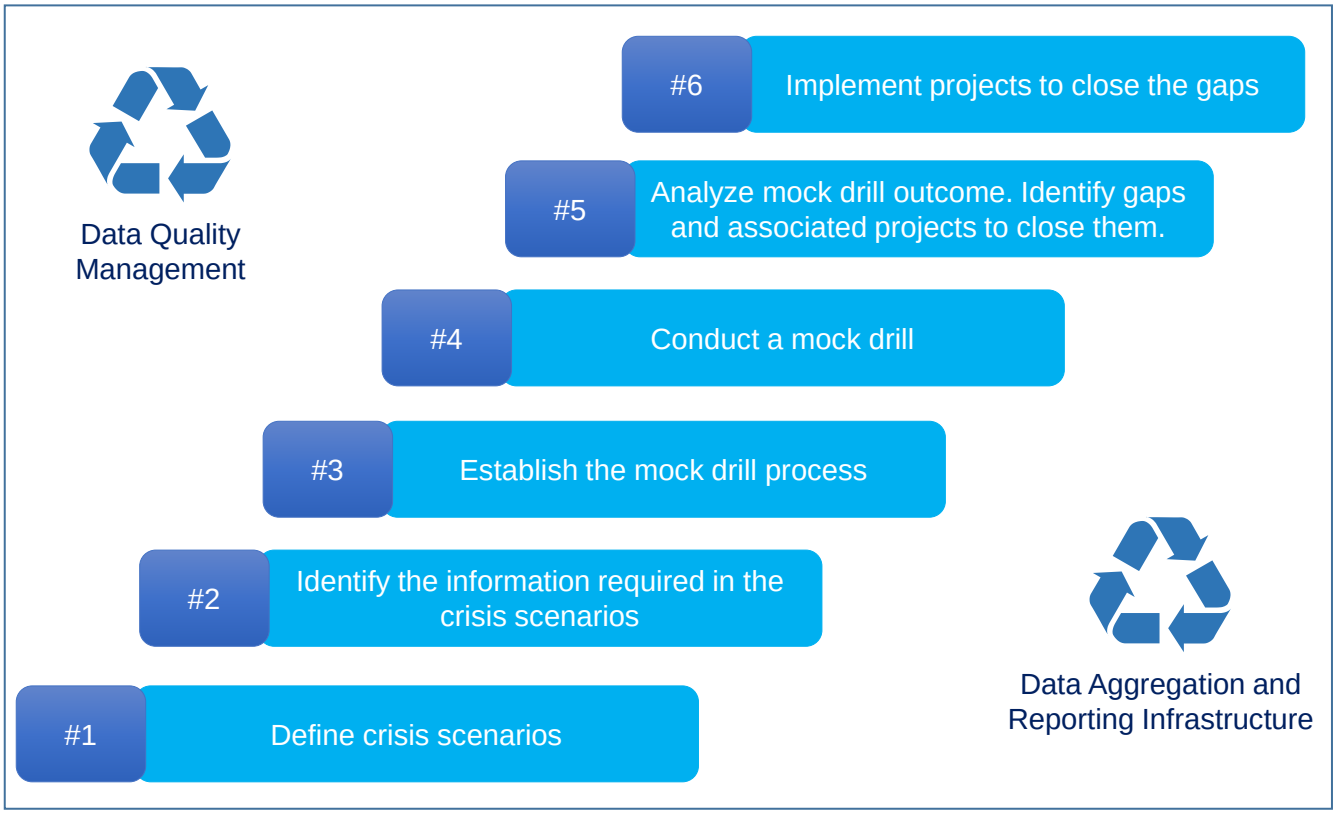

Figure 1: Overarching Process Steps

Step #1	**Define crisis scenarios**
Description	First step is to define extreme but plausible crisis scenarios that will result in a crisis situation for the program or organization. The scenarios should be based on historic or emerging events and may be at a conceptual level.
Outcome	A list of crisis scenarios with well-defined description.
Real Example in Banking Scenario	• Currency Crisis (Under Credit Risk) is when there is a significant swing in foreign exchange or interest rate • Liquidity Crisis is when a bank suddenly realizes it doesn't have any liquid assets necessary to meet short term obligations.
Correlation to	Liquidity crisis as applicable to banking can also be applied for other industries which need

Other Industries	large liquid assets to manage their short term obligations. Other crisis scenarios needs to be defined based on the industry the organization belongs to.
Role of the Program Manager	PM needs to brainstorm and define the list of crisis scenarios that might impact the program or organization. They being the custodian of key programs in the organization have a good idea about the vulnerabilities. PMs need to even look at macroeconomic scenarios and trends in the industry to build the list.

Step #2	**Identify the information required in the crisis scenarios**
Description	List the Critical Risk Measures (CRMs) that need to be populated and reported to the management during the time of crisis for different crisis scenarios (as defined in Step#1). Figure 2 illustrates the relationship between CRMs and crisis scenarios.
Outcome	• List of CRMs documented (each crisis scenarios defined will have an associated list of CRMs. Some CRMs may be common across multiple crisis scenarios) • CRM Lineage (end-to-end process flow on how a given CRM will be populated)
Real Example in Banking Scenario	In the example for currency crisis scenario, some key CRMs are Mark to Market, Net Nominal value, and so on. Similarly, for liquidity crisis scenario CRMs can be Commitment data, debt spread, and so on.
Correlation to Other Industries	The CRMs will vary depending on the crisis scenarios identified (as part of STEP #1).
Role of the Program Manager	PMs should ensure that the right CRMs are identified and defined for each crisis scenario. PMs should coordinate with various other stakeholders in defining and capturing appropriate CRMs. They might outsource the work to a Business Analyst however, they should lead the initiative.

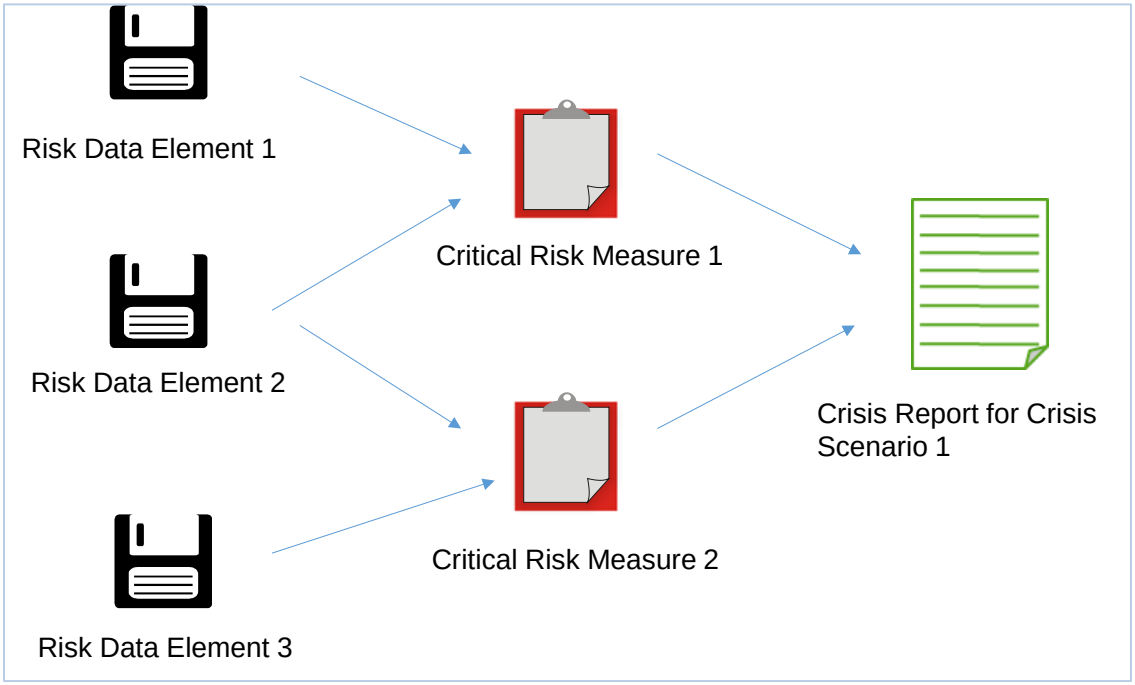

Figure 2: Relation between CRMs and Crisis Scenarios

Step #3	**Establish the mock drill process**
Description	This is the most crucial piece of the framework. It lays down the process that needs to be followed during an actual crisis.
Outcome	Documented detailed mock drill process covering the following key aspects: • When should the mock drill procedure be invoked • Task list to be carried out by various stakeholders during the mock drill • Standard operating procedure to be followed for gathering and consolidating data for critical risk measures associated with the defined crisis scenarios
Real Example in Banking Scenario	Detailed mock drill process defined for each risk department for example, market risk, liquidity risk and so on.
Correlation to	A standard mock drill process document should be prepared to cover various crisis

Other Industries	scenarios. If there are multiple departments within the organization, we can have a separate mock drill process artefact for each department based on their needs for crisis reporting.
Role of the Program Manager	PM should lead the team in defining the mock drill procedure. Once it is defined, the PM can even be the custodian of it and it will be his primary responsibility to maintain it.

Step #4	**Conduct mock drill**
Description	To check the effectiveness of the mock drill process during time of crisis, the process should be carried out as a drill every year (preferably with production data)
Outcome	Outcome analysis document from the mock drill process. It should highlight the key findings and any gaps identified in the process that may impact crisis reporting during actual crisis.
Real Example in Banking Scenario	A word document or PDF highlighting how the process was conducted, key highlights, and gaps identified. It is signed off by competent authority who own the mock drill process.
Correlation to Other Industries	A similar document artefact.
Role of the Program Manager	PMs should ensure that the mock drill outcomes are properly documented and circulated with key stakeholders for socialization and signoffs.

Step #5	**Analyze mock drill outcome. Identify gaps and associated projects to close them.**
Description	Based on the mock drill, identify the gaps and projects that need to be implemented to close the gaps.
Outcome	Gap analysis document and corresponding project to be implemented close the gaps (if any). Gaps can be in the area of infrastructure, technology or the process itself.
Real Example in Banking Scenario	Gap analysis document highlighting: • List of gaps identified • Corresponding project that needs to be funded to close the gaps • Details about the projects including budget, resourcing and infrastructure requirements

Correlation to Other Industries	Similar gap analysis and closure artefact
Role of the Program Manager	PM needs to identify the list of projects required to close the gaps. They should also help define the initial project scoping document and funding document to kick start the project.

Step #6	**Implement projects to close gaps**
Description	Prioritize project, get necessary funding, and implement the projects identified to close the gaps.
Outcome	Project management related artifacts.
Real Example in Banking Scenario	Standard project management related artifacts.
Correlation to Other Industries	Standard project management related artifacts.
Role of the Program Manager	Liaise with the Project Managers handling the implementation project to ensure that the project outcome meets the requirements in closing the crisis reporting gaps identified in Step #5.

3. Technology

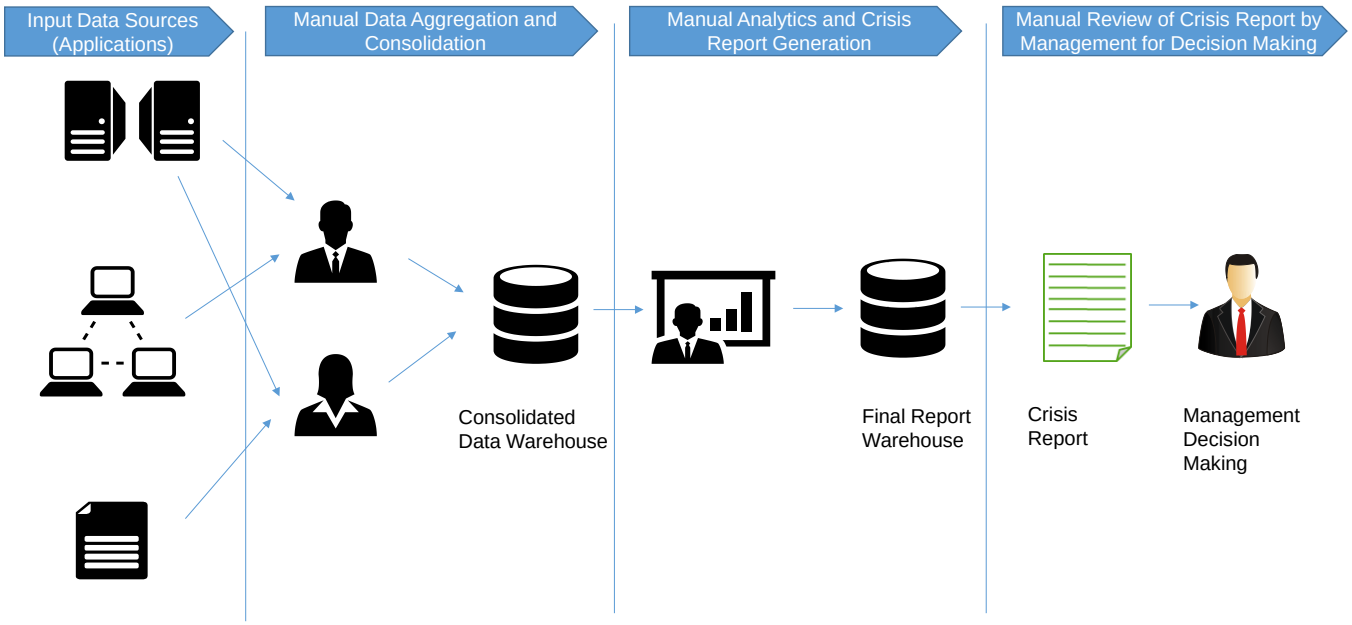

Figure 3: Traditional process for risk data aggregation and reporting

The key component of crisis reporting is the mock drill process. In an actual crisis situation, this is the process that needs to be coordinated by the Program Manager responsible and accountable for the crisis reporting framework. The crisis reporting process (depending on the industry) can be an exhaustive process as it involves collecting information from multiple systems at a short time, that too as per the laid data quality principles and standards. Inaccurate reporting of data or delay in timeliness of data can lead managers to take uninformed decisions which might impact the whole company or program during an actual crisis. The traditional approach involve manually getting data from multiple source systems into a single system, doing manual aggregation and calculating to produce the final crisis report. Any reconciliation and quality checks are done manually or through inefficient technology usage for example, excel spreadsheets. Figure 3 depicts a traditional process that most organizations follow. This manual intensive process has numerous challenges including:

1) Data accuracy and consistency

2) Data quality
3) Manual errors introduction
4) Difficult to reconcile report data
5) Slow process

In short, not only the process is time consuming, but also the data reported has huge chances of errors and cannot be used scientifically during crisis reporting.

Emerging technology, especially Big Data, has empowered IT managers to automate the process end-to-end ensuring stringent data quality and process governance check gates. Figure 4 depicts a big data based architecture to enable crisis reporting.

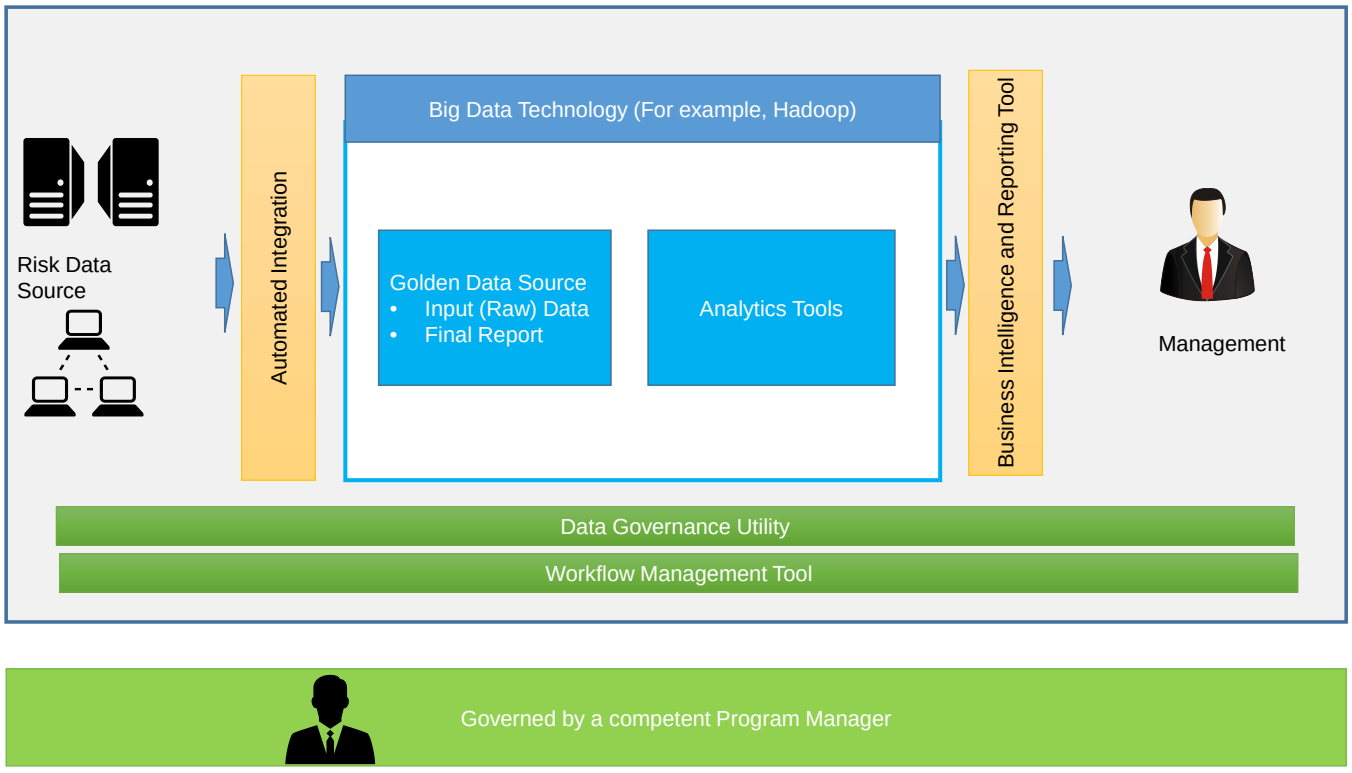

Figure 4: Leveraging Big Data for crisis reporting

Following are the key elements of the architecture:

- **Golden Data Source**: Sourcing data during a crisis situation from multiple sources can be a tedious and erroneous process. The best approach is to have a golden source of data which is a single source of truth for all data required for crisis reporting. Ideally, all source systems where data exists and is required for crisis reporting should periodically feed data into the golden source. The golden source can be built within Hadoop (A market leading and widely leveraged Big Data Technology) which provides a scalable and cost effective data warehousing option.
- **Automated Integration**: As discussed earlier, to keep the golden source of data up and running, all relevant source systems need to periodically feed data into Hadoop. For this, a robust integration mechanism needs to be built. It should support both real time and batch update to Hadoop from different sources.
- **Analytics Run on Hadoop**: One key manual intervention in the mock drill process is manual data aggregation and calculation. Hadoop provides multiple technology like Spark, Pig and so on, that can be efficiently used to process data stored in the golden data source to populate the output crisis reports. The output reports and its associated supporting data is stored in Hadoop for further reference and use.
- **Business Intelligence (BI) and Reporting Tool**: Producing output (crisis report in our case) is only a part of the job. Managers need to analyze the data reported in the crisis report to take management decision during crisis. For this, the manager needs robust analytics and business intelligence tool to analyze the report data. There are a lot of good BI tools available in the market that can easily integrate with Hadoop which managers can use to analyze the reports.
- **Data Governance Utility**: The quality of crisis reporting lies in the quality of data made available for processing. It is therefore necessary to have a robust data governance and profiling utility to ensure data quality check at each level of data processing like – aggregation, calculation, reporting and so on.
- **Workflow Management Tool**: The entire process needs manual intervention based on roles and responsibilities defined as per crisis reporting governance structure. To ensure that every stakeholder in the value chain does their job efficiently, a robust workflow management tool is required.

Conclusion

For Vision India to succeed, we need to incorporate crisis reporting in a more holistic manner as part of the risk management practices. Given the emerging complexities and uncertainties involved during the crisis situations, program managers have a daunting task to stand guard and sail the program or organization through during times of crisis. New age technology like Big Data supported by a robust crisis reporting framework, as discussed in the paper, will empower the program managers for managing tomorrow's crisis situations efficiently.

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