



PIPELINE DATA IN MOTION

Automated data integration and its impact on pipeline risk and integrity management

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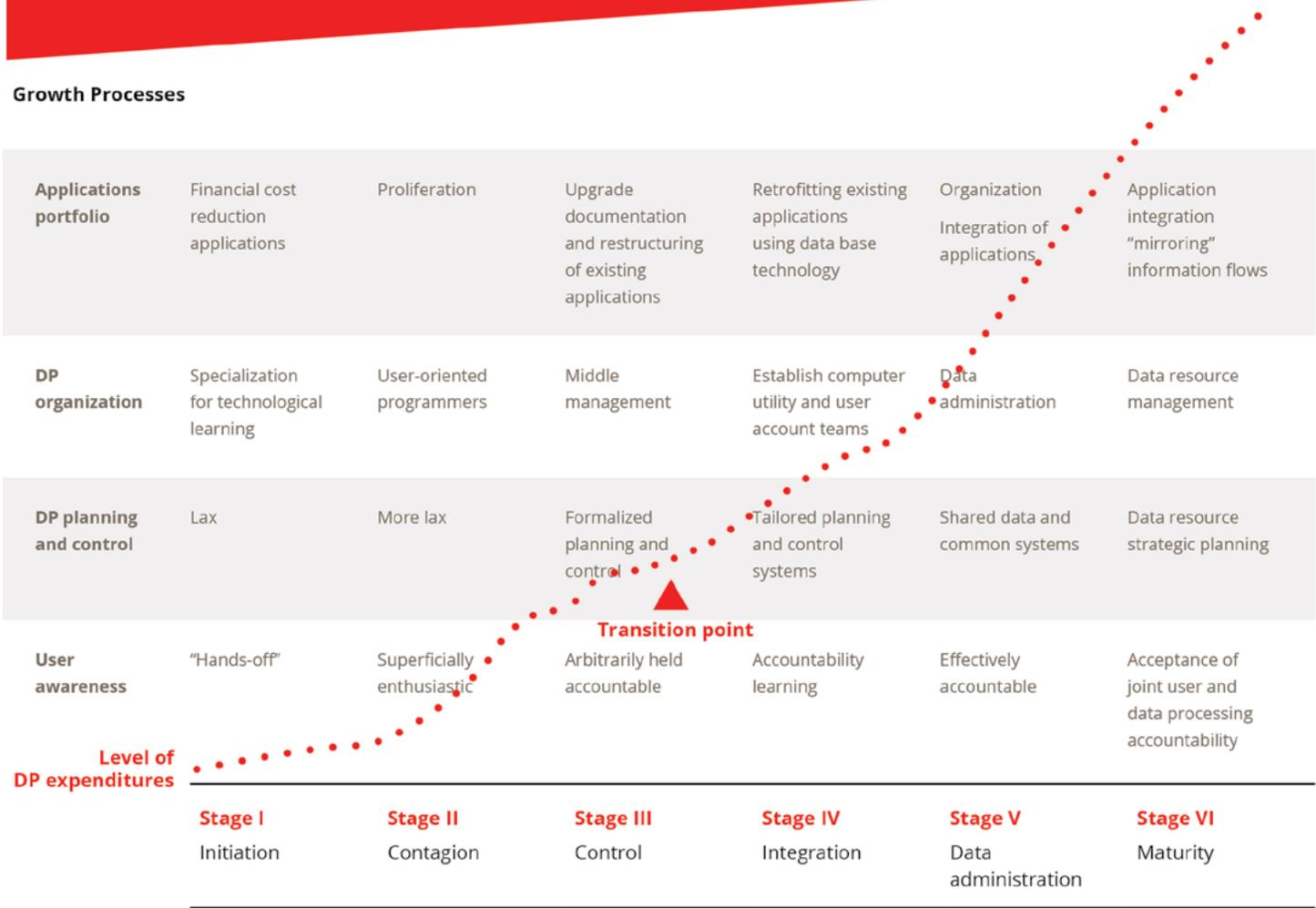
In pipeline risk management, collecting and analyzing data is the name of the game. Simple right? Yes and no. We have witnessed the extraordinary advances in the pipeline industry using new technology making information collection easier and seamless, but each new application, each new solution, adds to the proliferation of data and data silos. The complexity of the data within each new system is miles away from the simple files and databases of past years. The internet and mobile devices generate enormous volumes of less structured data that includes pictures and video; and cloud computing now extends an organization's data beyond localized systems. Fortunately, automated data integration processes can gather all this new data from virtually any disparate source and aggregate into one place.

The need for data integration has grown as the number of systems continues to grow. The management of data in motion represents the opportunity an organization can realize to improve their pipeline risk management program, providing data reliability, deeper insights and actionable intelligence.

WHAT IS DATA INTEGRATION?

In the 1970's, Richard Nolan outlined his theory called the "Six stages of data processing growth" in his Harvard Business Review article *"Managing the Crises in Data Processing"*¹. Nolan's theory is now nearly 40 years old and the vision he put forth still holds true today.

Exhibit 1 – 6 Stages of Data Processing Growth



¹ Nolan, David (March, 1979). "Managing the Crises in Data Processing", Harvard Business Review

The majority of pipeline companies are between Stage III (Control) and Stage IV (Integration), with the goal of getting to Stage V (Data Administration). The proliferation of packaged software and decentralized computing requires organizations to enter the stage of integration, where systems are constructed to transfer data between applications.

Data integration is a process by which data and information collected from different sources is combined into a unified view, making it actionable and valuable to those accessing it.

The movement of data, not the persistence of data, is the focus of data integration. The most complex and difficult part of integrating data is transforming the data into a common format. Through understanding the data to be combined and understanding the structure of the combined data, the process can be achieved and optimized.

DATA INTEGRATION FRAMEWORK

The basic framework of a data integration process involves:

- **Extracting**
Pulling data from its source system and converting it into a single, consolidated format.
- **Loading**
Moving transformed data into the common repository for analysis.
- **Transforming**
Cleaning, filtering, aligning and applying business rules to the extracted data.

WHY DATA INTEGRATION IS IMPORTANT

Risk management programs are dependent upon accurate data and while insights can be determined by looking at individual data sources, data integration allows risk engineers to see the complete 360-degree view. Without unified data, a risk assessment involves accessing data within native apps, copying over the data, reformatting, and cleansing, all before the assessment can happen.



Data required in your pipeline risk management program may be stored in expert systems such as GIS, work management or in third party and public systems.

MAKING INTEGRATION A PRIORITY

Data integration is often forgotten about or buried under other priorities within your risk management program. Having a smart, proactive integration strategy in place will put your pipeline data in motion. Using agile, strategic integration tools and solutions, you can immediately begin to see increased confidence in the risk assessment results.

UNSTRUCTURED DATA

In the past, data that needed to be integrated was stored in databases. Now there is a need and desire to integrate data from a variety of formats including documents, websites, images and video files.

CLOUD INTEGRATION

As more data is stored in the cloud, integration is required to enforce the data consistency as it migrates between the cloud and on-premises systems and databases.

DATA INTEGRATION QUESTIONS

Data integration is an automated procedure based on requirements and rules driven by risk and integrity management processes. It is important to gather and define all of the requirements for extraction, transformation and loading as part of the data integration design. The following key items should be considered during this process to ensure a robust, complete and effective integration system.

- 1 What information is available from which source?
- 2 Is the data reliable?
- 3 Will bi-directional data sharing be required between systems?
- 4 Is near real-time data sharing required, or will the data be refreshed nightly or on some less frequent schedule?
- 5 How much data is shared and what information can be consolidated before it is transmitted?
- 6 Does the proposed target server have sufficient processing capacity, storage and network speed?
- 7 What, if any, data transformations are required when moving data from the source to the target?
- 8 Will unstructured, cloud or third party data be included?
- 9 What level of auditing is required?

Effective data integration requires both business and technical understanding of the data being passed between systems and the problem(s) it needs to solve.

ABOUT US

Dynamic Risk's technology and consulting services optimize risk-informed decision-making to manage risk through an asset's entire life cycle. Our IRAS platform software models pipeline systems to proactively determine where they are most likely to fail and the corresponding consequences of unintended releases. From gathering systems, midstream pipelines, transmission pipelines, and distribution networks, we have software applications and in-house engineering expertise to provide complete pipeline risk assessment, data management, and compliance reporting.

Dynamic Risk is part of Previaan, a fast-growing, innovative, and private industrial technology group focused on advanced diagnostic technologies to monitor the world's infrastructure health. The Group serves asset owners, large engineering firms, and service companies globally in markets such as Aerospace, Civil Infrastructure, Energy, Mining, Power Generation, and Rail. Via sensors, hardware, robotics, and software, Previaan makes a safe and sustainable future possible, by pushing the limits of diagnostic technologies that preserve the integrity of our world's critical infrastructure and assets. More information can be found on the company's website: www.previaan.com



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