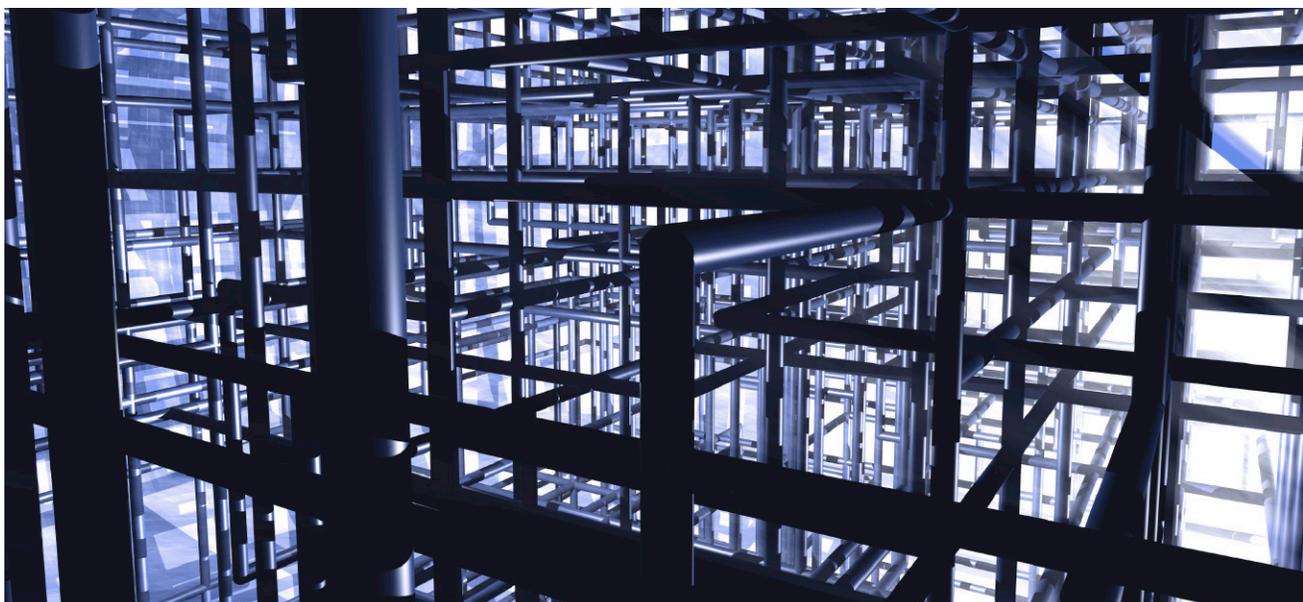




# Taming complexity with analytics

## Executives underestimate back-office process variability by a factor of 100



### Introduction

Unnecessary complexity and unintended variability in business processes are pervasive challenges in large organizations. Even with large-scale ERP projects and huge investments intended to automate and standardize business processes, the problem persists and is increasing in scope and consequence. While the existence of the problem is widely accepted, determining precisely how, where, when, and why the complexity and variability are occurring has been difficult if not impossible.

A Deloitte survey found that 70% of finance executives said their organizations have had only limited success in surmounting complexity.<sup>1</sup> Taming it is a large, untapped frontier that offers organizations a significant opportunity to reduce back-office expense.

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Our clients discovered that process variation is at least 100 times greater than what they imagined. In fact, 5,000 or more variations are common in most end-to-end processes.

The data and tools to support fact-based analyses were lacking. But not anymore. Today, we can get to the data and provide a picture of what is really happening in end-to-end business processes throughout an enterprise. Working with proprietary analytics software (Process X-ray™) we have analyzed the actual process data at dozens of

<sup>1</sup>Deloitte Dbriefs, February 2011



companies. The results were eye opening for our clients: They discovered that process variation is at least 100 times greater than what they imagined. In fact, 5,000 or more variations are common in most end-to-end processes. Such high levels of variability are a natural enemy of scalability, efficiency, and process control.

Process X-ray provides visibility of what is really happening based on the actual event data captured in transactional systems. This is far different from the subjective recollections or assertions of people. Process X-ray does not judge. It uncovers and illuminates the facts. It provides the information necessary to determine appropriate actions.

### Why complexity flies under the radar

Complexity exists in virtually all large processes (see *Complexity and process efficiency*). It is difficult to spot and even harder to eradicate. The challenge is especially acute in back-office processes which consist primarily of information flows. Unlike manufacturing processes, where users can see tangible products and visually spot sources of complexity (e.g., high work-in-process inventory and production line interruptions), information flows are practically invisible and rarely tracked.

Another factor that conceals process complexity and variability is when data is only available at a department or activity level. Getting the data to create an end-to-end view of a large process is a monumental task. However, only an end-to-end view will reveal the complete picture and what stands in the way of an efficient and successful outcome.

An end-to-end view encompasses all process inputs and outputs. It also supports the examination of the entire workflow and how the combination of all these factors increases complexity and unpredictable process behavior. In an order-to-cash process, for example, sources of complexity may not be visible from any individual department perspective, such as different revenue recognition approaches across the organization, custom (and sometimes manual) invoicing, different interpretation of risk policies, users creating different workarounds, and/or different record-keeping requirements.

## Complexity and process efficiency

Quality, speed, and complexity are the three fundamental drivers of process efficiency. In this article we are delving into complexity. We define it as the variability and interrelatedness of discrete process elements including products, customers, vendors, locations, business units, process steps, policies, and IT applications. We have identified three primary types of process complexity within back-office processes:

- **Input complexity** stems from upstream functions including sales and marketing, procurement, and customer relationship management. The greater the number and variety of inputs, the greater the complexity in back-office processes. When inputs are not standardized, G&A processes have high set-up and lead times and excessive work-in-process inventory—often in the form of invoices or orders waiting to be processed, emails not answered, or calls not returned.
- **Output complexity** is driven by internal customer demand. These outputs include: the number, frequency, and granularity of finance reports; the number of benefit plan options, job titles, and incentive compensation plans in HR; and the number of applications, degrees of customization, and variety of IT applications.
- **Workflow complexity** occurs when processes are convoluted, redundant, and generally stop and go. As complexity grows (typically because of out-of-control inputs and outputs), so do the exceptions to straightforward or standardized back-office processes.

## Missing the forest for the trees

Untamed complexity manifests itself through a number of symptoms. At a high level, these symptoms can be readily measured and compared against external benchmarks, such as cost to serve, use of working capital, service delivery and quality, and productivity.

Often, companies are aware of these symptoms but don't have the ability to ferret out the actual root causes. Root causes are often difficult, if not impossible, to identify and quantify without an analytics tool such as Process X-ray which is specifically designed for this purpose (See *About Process X-ray*). Root causes don't exist in a vacuum. Complexity is often the result of many interrelated factors that build on each other making the chain of causes and effects difficult to see.

For example, measuring the first-time-right of a particular task and the associated rework and waste requires both an understanding of where in the process the issues lie and comprehensive data that accurately points to potential root causes. Without Process X-ray, process lead times, handoffs, changeovers, workarounds, and non-value-added activities are subjectively determined based on opinions of participants in the process that can cloud the understanding of root causes.

Such subjectivity can also stymie the success of proven improvement approaches such as Lean Six Sigma when applied to back-office processes. Because access to back-office process data is difficult to obtain, the effectiveness of Lean Six Sigma tools is often undermined by crude estimates of lead times, process interruptions, defects, and the costs of each activity in the workflow. Even when data is used, practical considerations limit it to a small sample which may not be representative. In the worst case, subjective impressions and limited data can lead companies to focus on the wrong issues or tackle only a piece of the puzzle.

Consider a global industrial company that was grappling with mounting expenses in its back office operations. The cost to manually process an invoice was a key issue and had actually increased after implementing an ERP system. To get at the heart of the matter, the company launched a process improvement project primarily using stakeholder interviews and pain point workshops.

Initial workshop discussions surfaced several issues in the procure-to-pay process. Some participants identified the company's decentralized structure and lack of standardization as the main problems. Others felt that users considered the ERP workflow too complex and that the old manual process was simpler to execute. Unclear master data naming standards

## About Process X-ray

Process X-ray is an advanced analytics software that leverages terabytes of data locked in ERP systems. It helps companies eradicate complexity through four straightforward and effective capabilities embedded in its DNA:

- Revealing an end-to-end view of processes
- Drilling down into company issues at the activity level and quantifying individual user behaviors
- Providing benchmarks for internal best practices
- Offering a single version of the truth to improve decision making

Beyond fighting complexity, the insights generated by Process X-ray can improve these critical drivers of business success:

- **Revenue:** increasing revenue by improving delivery reliability
- **Operating margins:** reducing workload and increasing efficiency through greater levels of automation
- **Asset efficiency:** reducing working capital by improving cash conversion cycles
- **Compliance:** improving the effectiveness of process controls

Process X-ray has helped many organizations tame the complexity in their back-office processes. The result is a new ability to reduce process variability, variation in cycle time, the number of users involved, and manual process steps. With these improvements, companies can significantly reduce complexity and improve working capital, process controls, and service levels in order to bolster the satisfaction of their customers.

were another challenge, with users often creating duplicate master data such as multiple names for the same part.

Trying to dig deeper, the team applied value stream mapping to a small sample of invoices to test the hypotheses developed in the workshops. The results led to a set of improvement opportunities including eliminating workarounds and establishing policies to increase compliance with the designed workflow and master data standards. But the needle barely moved—the costs to manually process an invoice remained much the same.

Had the industrial company used an analytics tool such as Process X-ray, it could have found the actual root causes of its process inefficiency (see figure 1). For example, invoices were likely following any of several thousand different paths through the process. Although the majority might have hewed closely to the process design, a significant number probably weren't. A deeper look might have found large variation between different locations. That variation, in turn, could have been caused by ineffective training which could drive users to circumvent the new process and revert to the old way of doing things. Without this deep level of insight, the company probably couldn't identify nor address the true root causes of the issues and achieve the needed performance improvements.

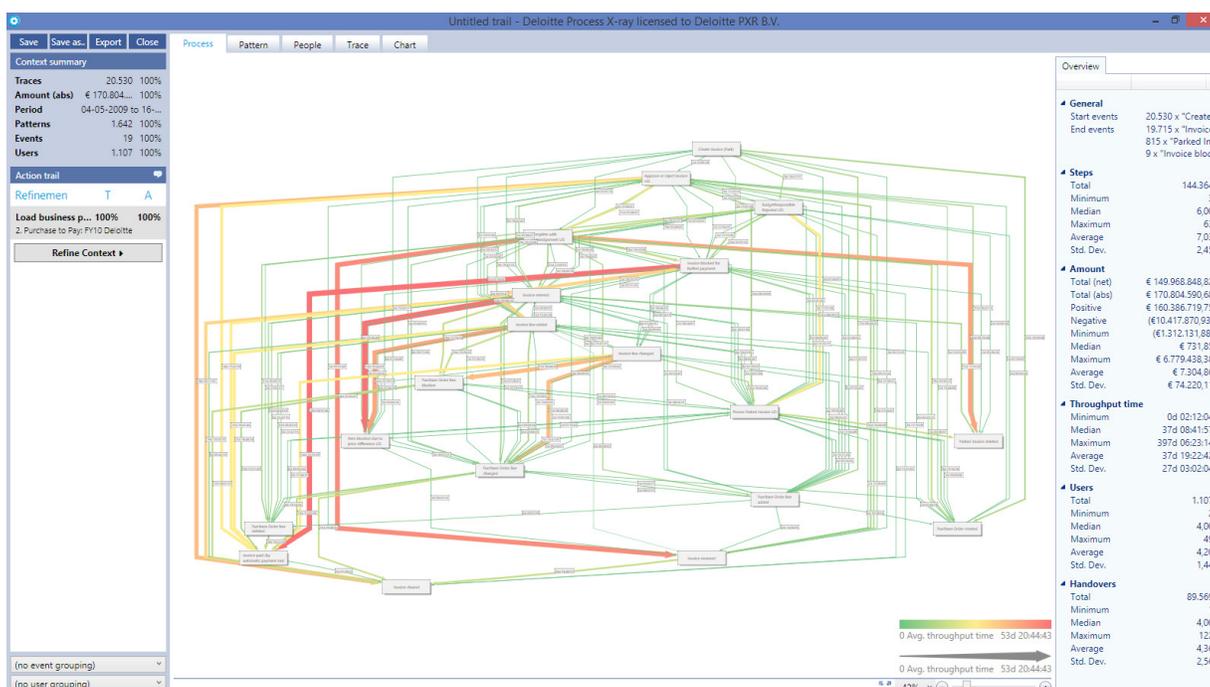
### Fighting unnecessary complexity and variability

ERP systems contain much of the data needed to identify the root causes of complexity. Using algorithms, Process X-ray examines data and allows companies to measure complexity precisely at the level of specific activities tracked in the ERP system. That precision allows companies to zero in on the amount of variation occurring at specific points in back-office processes.

Through intuitive visualization tools, Process X-ray reveals input, output, and workflow complexity, and spotlights these key sources of variation:

- **Process variability:** the number of different ways an organization executes an end-to-end process
- **Cycle-time variation:** the variation in time it takes to move from one process activity to the next
- **Number and type of users and departments involved:** the number and different types of users in the end-to-end process and the back-and-forth interaction among those users between departments
- **Variation in attributes:** the number of different descriptive characteristics and parameters such as order type, document type, or payment terms

Figure 1. Actual execution of an organization's Accounts Payables process visualized by Process X-ray



## Success stories from the field

We have used Process X-ray successfully with companies in many industries, including technology, aerospace, manufacturing, oil & gas, consumer products, and telecommunications. Across these industries, we have found a striking similarity in what drives back-office process complexity. By tackling these issues, companies are shaving 15% to 20% off their back-office process costs.

### Taming 53,000 process variations

A large global manufacturing company found that, compared to industry benchmarks, its performance on several processes was fair to middling. In response, the organization launched several process improvement efforts to drive scalable efficiency across its complex operations. As part of the effort, the organization used Process X-ray to examine and improve its order-to-cash process.

After Process X-ray unlocked ERP data, company leaders were shocked to find more than 50,000 variations in the order-to-cash process. Closer inspection found three root causes that accounted for 55% of rework and process interruptions:

- A programming bug was automatically blocking many invoices, which required users to manually unblock them
- The system was miscalculating many customers' current balances, triggering unnecessary credit checks
- Individual credit departments were putting customers with similar credit histories into different risk categories—a large number were classified as high risk, which added even more unnecessary credit checks
- By understanding the precise source, volume, and causes of the issues, the company created a roadmap calling for new policies, such as updated risk thresholds, to accelerate and simplify processing. The organization was also able to target its change management and training efforts to specific issues and users.

### Realizing the goal of automation

Another large global organization was working hard to induce customers to use EDI when placing orders so the

company could automate the process and reduce the number of touch points. However, the company continued to struggle with highly unreliable cycle times in its order-to-cash process that EDI was meant to eliminate. The business needed to understand why and used Process X-ray to find out.

The data analysis found significant variation in cycle time between operations in different countries. Armed with that knowledge, the company could investigate root causes. Company leaders learned that EDI-processed orders were often wrong and that the order desk would ask sales to contact the customer and verify that the order was correct. Delving into the issue more deeply, the business found that how it was handling master data was one of the root causes: SKUs weren't being properly maintained and causing errors in the EDI processing. Since root causes are part of complex systems with many interrelated parts, management didn't see their complete effect. Users had simply accepted the problem and added considerable complexity to the process by creating workarounds.

### Shortening the tail

At another large enterprise, finance and procurement were each blaming the other for inefficiencies in the purchase-to-pay process. Using Process X-ray, the company learned that the tail of the purchase-to-pay process (the 20% of orders causing 95% of process variation) typically had 40% more hand-offs and 20% longer cycle times than the five most frequently used process variations.

Digging more deeply into the data, the company found that interruption and rework, such as changing invoice lines (e.g., changing price, quantity, order number, and cost center) were among the primary causes of process variation. Launching an improvement program with the data, the organization discovered one of the important root causes—the procurement catalog was not regularly updated, causing purchase order errors and resulting rework.

## Making it happen

To understand the potential cost advantage from sleek back office functions, business leaders should begin by answering these questions:

- Is our organization experiencing any common symptoms such as high cost to serve, poor service outcomes, or low productivity?
- Are there significant differences in the efficiency of back-office processes between different parts of the organization?
- Do we have a complete and detailed view of processes and clear evidence that they are operating according to standard?

Fighting complexity has become substantially easier with technology that provides an end-to-end view of inputs, outputs, and workflow complexity. However, Process X-ray as a tool does not change the business. It provides insights. Keys to successfully tackling complexity with analytics include:

- **Using a proven process improvement approach:** Combining facts generated by tools such as Process X-ray with techniques such as Lean Six Sigma can systematically uncover root causes and help create a roadmap to eradicate complexity.
- **Knowing the process:** A powerful tool can answer thousands of questions. Understanding the process helps you ask meaningful questions and arrive at powerful answers.
- **Developing and testing hypotheses:** Process X-ray is most effective when testing hypotheses. Develop a finite set of hypotheses through interviews, workshops, and initial metrics with Process X-ray that can be validated quickly.
- **Understanding the people:** Most root causes are not process design flaws, but softer issues such as training, capabilities, decision rights, and governance. Knowing what users do and why is central to tackling these softer issues.
- **Involving users:** Working directly with users unearths the stories behind the data through deep dives into specific areas. Involving them in the solution helps to secure buy-in and sustainable improvements.

The demand for scalability and efficiency can be relentless. Unchallenged process complexity stands in the way.

To eradicate complexity, businesses need an advanced analytic capability to zero in quickly on root causes and assure that corrective actions will have the needed impact. Process X-ray has provided that capability for many organizations. It enables the insights needed to understand the root causes of issues through a single version of the truth that aligns the organization around improvement efforts.

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