MANAGING CORPORATE RISK

GLOBAL PAYMENT CARD PROCESSING COMPANY

Client Case Study

URMGROUP

Case Overview

Up until the late 1990s, third-party payment processing was a very lucrative business model. Then new market entrants created pricing pressures, which led to margin erosion for the established market leaders.

At the same time, modernization of processing platforms became necessary to support an expanding global economy and evolving market requirements, which included clearing transactions in a timely, accurate manner and reflecting in near real time activities undertaken by the cardholder at anytime and anywhere in the world. Adding more functionality, such as reward programs and value-added services, became a key competitive differentiator.

As this market shift occurred, the leading payment processor was unprepared to meet changing market demands. Ongoing enhancements and modifications over multiple decades had led to decreased system efficiency, higher operational costs and made it difficult for the company to successfully undertake any large-scale re-engineering or system modernization projects.

The company needed better insights into the root cause of their current problems and perspective on future risks, as well as more efficient and reliable methods to identify and vet possible solutions. The predictive and prescriptive intelligence gathered using X-Act OBC Platform supported a board-level re-engineering decision, tracked the program execution and the verified results—all while helping to manage and control the risks.

Case Highlights

Implementation Characteristics:	• 30-year-old **payment card processing platform** • Processing over **400 million credit and debit card accounts** • **Serving over 1,400 banks** offering credit and debit card services to businesses and consumers
Business Goals:	• **Greatly reduce operational costs:** The cost per transaction must be low enough to support competitive pricing • **Regenerate competitive advantage:** Identify opportunities to offer new and improved services • **Support accurate cost based pricing:** Determine true development and total cost of each transaction type and associated features
Challenges:	• **Increasing complexity** caused by an over-stretched, aging implementation and external influencers • **Declining profit margins** caused by decreasing revenues while cost of doing business was escalating • **Managing reputation** during time of uncertainty due to market evolution and a growing number of competitive offerings • **Overcoming slow time-to-market issues** caused by a lack of adaptability of an aging payment processing platform
Business Constraints:	• **Cause no business disruption:** Nothing should prevent the organization from fulfilling its service commitments to existing issuers/clients • **Maximize flexibility by using open structures:** The engineering decisions should not in any way limit future development • **Move towards a component-based architecture:** When possible create a clear separation between information assets and replaceable components • **Allow for a phased approach:** The replacing of components and modernization efforts should be staged to support continuous improvement
Strategic Options:	• **Optimize:** Identify opportunities to optimize existing systems or sunset old components to do more, for less • **Transform:** Develop a re-engineering program to modernize the 30-year-old platform and execute a data profiling/cleansing project to improve platform performance • **Disrupt:** Replace the 30-year-old platform with new architecture and implementation to improve platform agility and performance with more efficient event processing capabilities

Stage 1: Build Emulator

The model of the business processes and underlying credit card processing platform were built using X-Act OBC Platform following the steps outlined in Step 1 and Step 2 below.

1) Capture the Necessary Information

Often IT incorrectly assumes, in cases such as this one, that it is possible to consider the processing platform as a closed loop system that can be sufficiently modeled using big data automatically captured from system monitoring tools, which include only the related service processes and infrastructure of the system. However, dynamic complexity is created through a complex web of internal as well as external influences. To build a representative model and strategically guide a business level decision, a top down approach was essential to uncover dynamic complexity related risks.

Industry characteristics, business goals and strategic characteristics of the implementation needed to be understood. This data was collected through: (1) interviews and workshops, (2) automatic collection of data and measurements, and (3) X-Act libraries. Once the emulation was built, the model then was refined with data that was predictively created through analysis of emulation scenarios.

Overview of Information and Data Required for System Modeling

Business Characteristics & Constraints
Collected through interviews and formal questionnaires

- Corporate strategy:
  - Business
  - Competition
  - Activity pricing
- Operational implementation:
  - Activity costing
  - Service management
  - Obligations
- Resources and management:
  - Business cycles
  - Resource utilization
- Peaks/valleys

Technical Analysis Measurements
Collected using automatic extractors

- Resources/events
- Resources utilization
- Outstanding issues

Patterns & Peer Evaluation
Populated from X-Act pattern libraries

- Best in class
- Implementation strategies
- Specificities

Fundamental Analysis
Predictively created through emulation scenarios

- Impact of external events
- Impact of internal services
- Impact of external service
- Impact of internal event

Gaining buy-in from business leaders was key to our success and made possible by clearly defining the goals of the project and how the expected outcomes would support a strategic business decision. Information collected related to industry characteristics and business goals included economics, competition and monitoring parameters covering one-year period, next 3-5 years and any longer-term objectives.

Information collected related to strategic characteristics included:

- Organization of business, organization of service
- Business implementation structures, physical and logical resources, human resources
- Business characteristics: volumes, quality constraints, geography, criticality, distribution windows
- Financial outlook, projections, constituents, priorities, resources, R&D
- Client relationships
- Competitive outlook: now and future
- Possible disruption: innovation, business models
- Business discriminant factors: impacting settlement, external dependencies
- Supply chain
- Strategic goals

As with any organization which has established a good level of management maturity, the company already had most of the information necessary to build the model in strategic plans, competitive analysis, and business process analysis and architecture documents.

After collecting the corporate-level information through interviews and existing documentation, system, infrastructure and metrics were automatically collected and populated into the emulator using existing data or X-Act OBC Platform connectors in cases where data automation practices were not already in place. Additionally, the assets contained in the X-Act libraries were used whenever possible and as needed to fill in any data gaps and speed the data collection process.

2) Build the Emulator

Multiple emulations were created to represent all operational scenarios and support multiple parameter scenarios. These emulations were built to support Stage 2 activities, which include predictively evaluating how changes in volumes, constraints and perception would impact the system in 3 to 5 years, as well as running speculative scenarios to identify points of failure in the system.

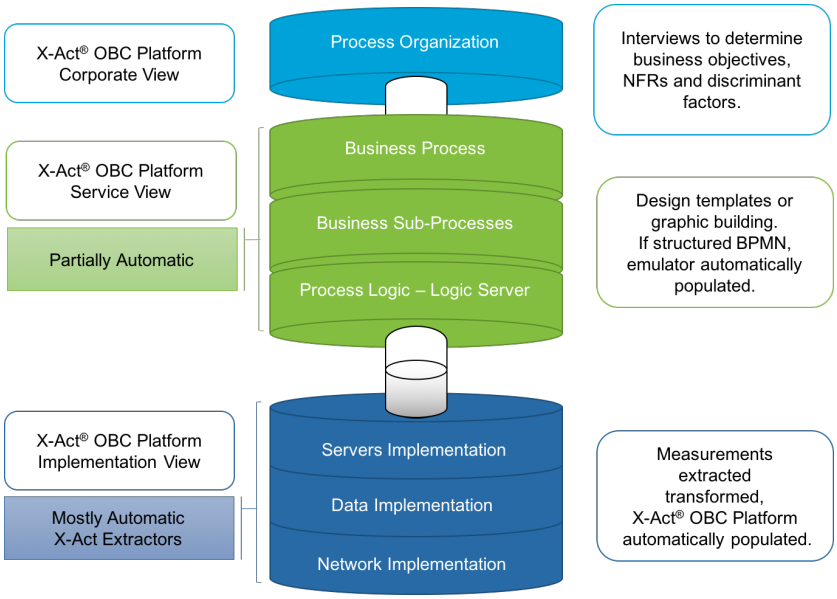


Figure 1 shows an example of how the model was populated using the X-Act libraries and the point and click features of X-Act OBC Platform.

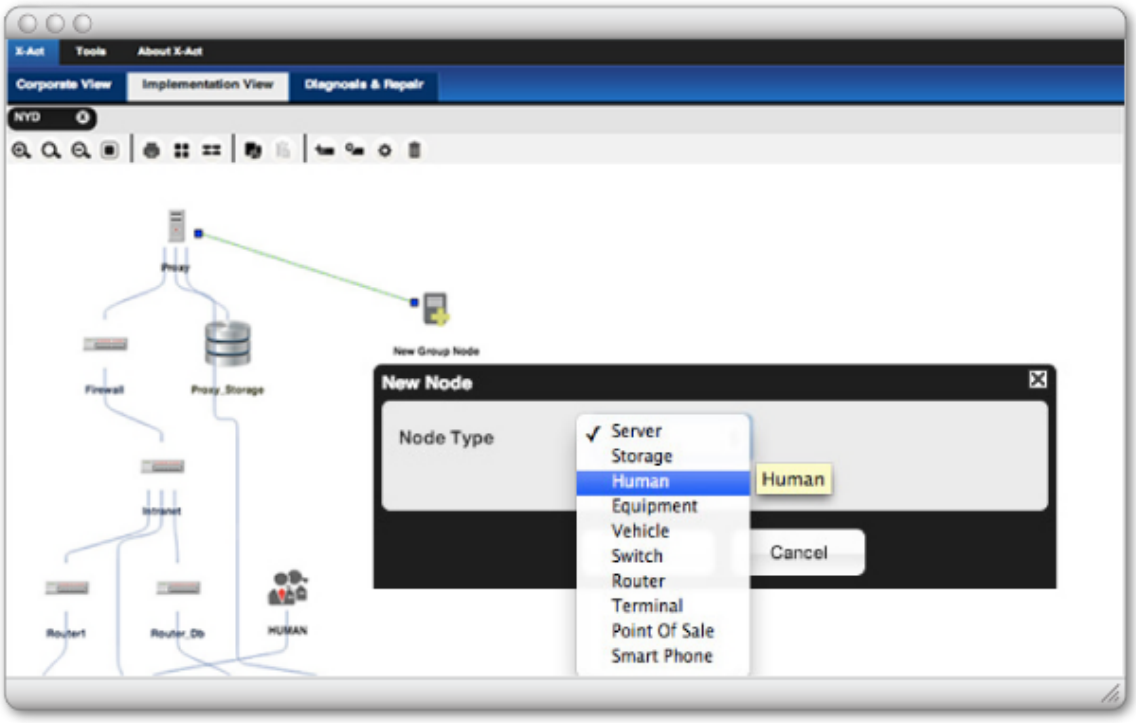


Figure 1. Building model from library components in X-Act OBC Platform

Stage 2: Perform Diagnosis

Once the emulation was built, we used the predictive analytics capabilities of X-Act OBC Platform to study current and predicted system behaviors as well as discover the root cause of current problems and understand future business risks. This was accomplished through stress testing and sensitivity analysis, which allowed us to see how the system would behave at different volumes and how individual components would behave under stress.

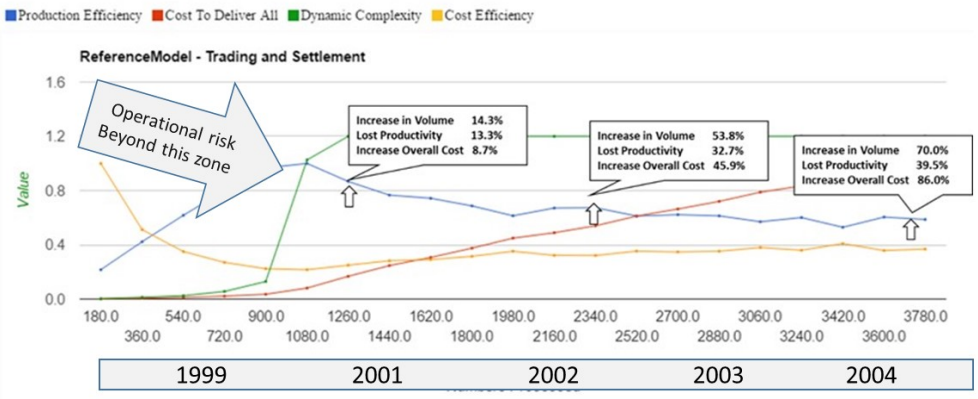


Figure 2. Degradation due to dynamic complexity

As visually represented in Figures 2 and 3, X-Act OBC Platform metrics showed that:

- Dynamic complexity had increased by 300% over a 5-year period—mainly because system owners had been continuously and reactively making changes to the system as needed to meet business requirements without completely understanding the impact of those add-ons, which led to a deterioration of architecture.
- Revenue per unit had declined by 39%.
- Costs to deliver had escalated by 86%.
- Time to market cycles had lengthened from one week to six months.
- The company began insourcing resources to offset pricing increases and bring costs back into alignment, however this threatened the advantages they had previously gained through a global outsourcing model.

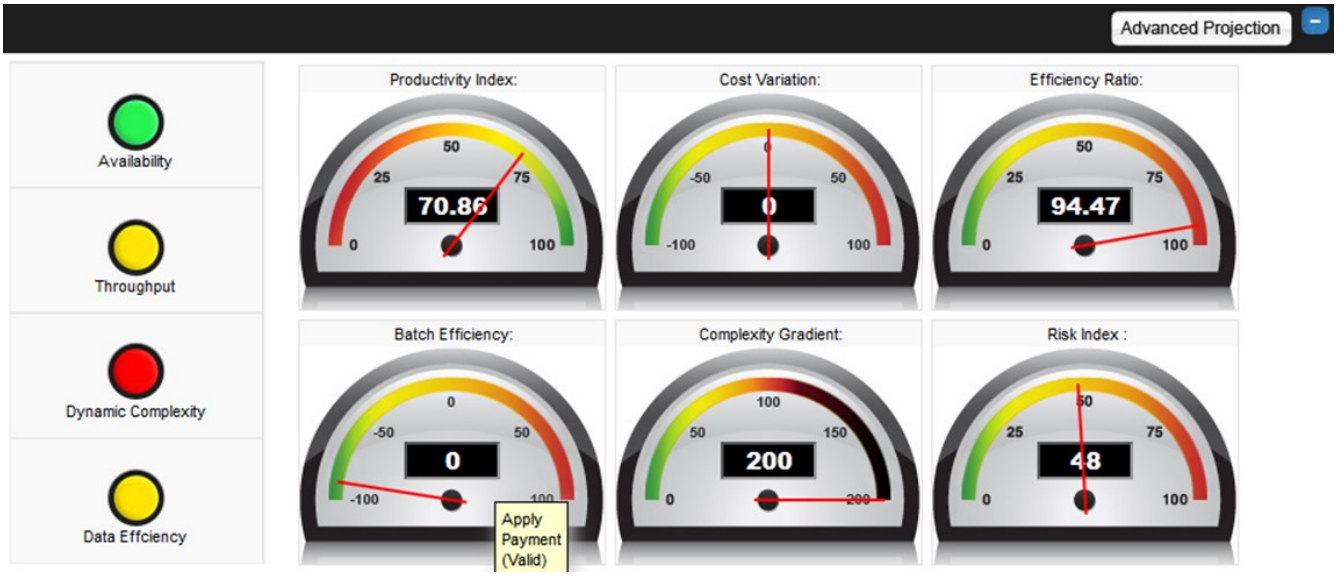


Figure 3. X-Act OBC Platform metrics

Causal Analysis Results

System aging naturally led to severe efficiency problems, as aging was forced by reactive maintenance that never questioned the long-term impact of the fix on the overall implementation:

- Over several years, the business system aging had become so high that there was a real threat to margins (cost escalation doubled over 4 years)
- The annual aging ratio was higher than 20% and accelerating
- Processor utilization per unit of work had moved from 5 to 23 millisecond (ms) in 6 years
- The nominal throughput, measured in millions of cardholder accounts, went from 26 to just 12 for the same period and normalized infrastructure characteristics
- Time to market moved from one week to 6 months due to the increasing complexity, and therefore difficulty to enhance and test system updates before moving them into production

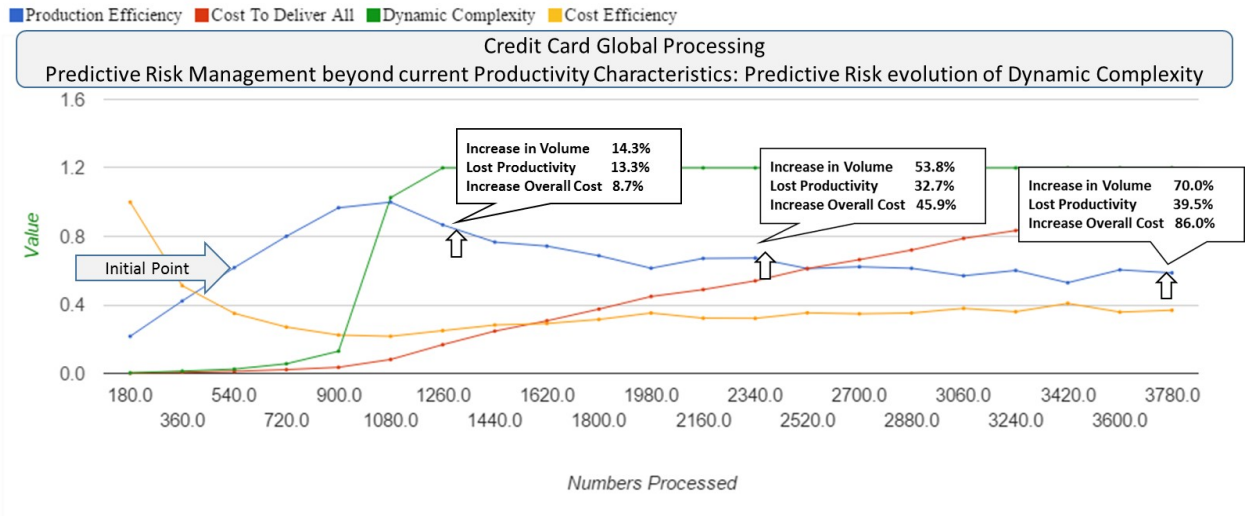


Figure 4. X-Act OBC Platform prediction revealed risk of accelerating system degradation

Stress Testing Analysis Results

Dynamic complexity poses a threat to corporate survival:

- The forward prediction showed an accelerating degradation that would create an unacceptable situation in terms of service quality and margin (revenue pressure and cost) within three years (see Figure 4)
- Other competitive alternatives that were available in the market place offered less functionality, reduced flexibility and higher cost structures—meaning that business consolidation would not make sense
- Market growth would only be modestly attractive—since service pricing pressures would continue and even accelerate—unless the company could create new opportunities through new financial instruments or new ways to apply the card processing model for new applications and activities in banking, healthcare, taxes, transportation or other areas

Stage 3: Identify Prescriptive Actions

We then used the X-Act OBC Platform to prescriptively emulate various remedial scenarios (see figure 5).

Figure 5 X-Act OBC Platform predictive diagnosis and prescriptive analysis

Overview of Strategic Options

Optimization	The following optimization options were defined and the limitations of each scenario were exposed using X-Act OBC Platform prescriptive emulation capabilities. Key findings were as follows: • A rebuild of major implementation components would yield a 40% gain in volume • Sun-setting old components would yield a 25% gain in resources utilization • Re-implementing the posting and cycling data model would yield a 20% gain in productivity • All options showed that operational risks would increase within five years due to continuous pressure on revenue and slow but still significant cost escalation
Transformation	All feasible transformation scenarios were explored. However, we identified the following obstacles based on the predictive emulation: • The speed to deliver all transformation options were incompatible with corporate constraints • The cost of transformation options was too high to be realistically considered—especially the cost for the data profiling/cleansing project • Uncertainty about how the future evolution of the market would impact the current business model made any significant investment in the old implementation risky
Disruption	We used predictive emulation to explore disruption scenarios, such as new business models and innovative approaches that would allow the business to become more agile and better prepared to meet the evolving needs of the card processing industry. The following disruptive scenarios were proposed: • Execute a corporate re-engineering project • Deploy a new implementation that would allow for new types of event processing • Reduce dependencies on intermediaries

Stage 4: Make Informed Risk Decision

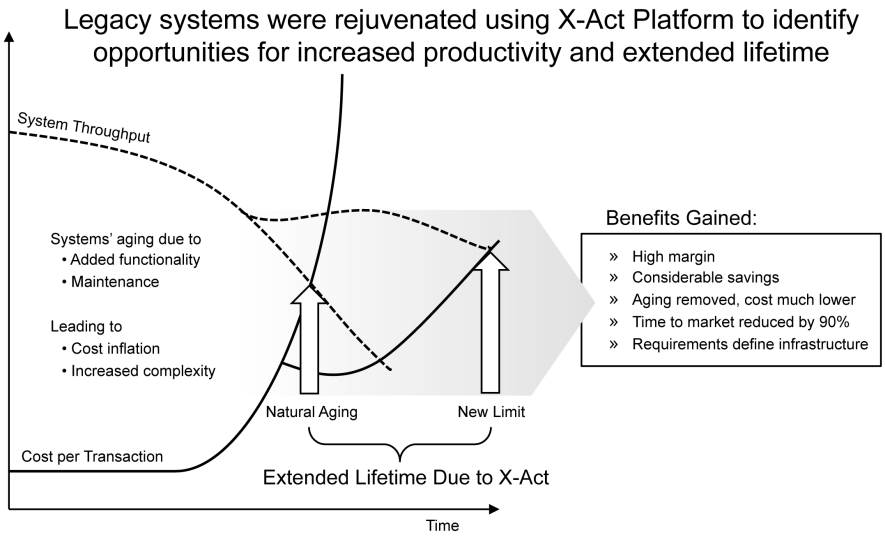
The outputs of the X-Act OBC Platform analysis were used to create an executive presentation of the immediate and future risks as well as proposed prescriptive solutions for consideration by the board. All risks and remedial options were evaluated based on their ability to meet stated business goals, which included greatly reducing operational costs and regenerating competitive advantage. The board considered the presented options in terms of the following criteria:

- Limitations of scalability, volume, quality of service and cost
- Cost to make the change in terms of complexity, required resources/skills and dynamic ROI (the length of time until it becomes possible for the business to break even with its investment in a new dynamic environment)
- Time to deliver
- Adaptability
- Industry imposed risks such as obsolescence, market evolution and competitive outlook

Board Decision: Proceed with Optimization Project

Ultimately, the board decided that the optimization project was the only viable strategic option as it met business constraints and could deliver 48% more volume for 30% less cost (see figure 6).

Figure 6. Optimization project extended lifetime of system and met business constraints



Key Decision Considerations

The following factors were key to the board's decision:

- Scalability is predictable at increasing volumes until the system hits a new singularity point
- Beyond the singularity point, dynamic complexity takes over—leading to an escalation in costs, which is predicted to increase by 85% while yielding only a 70% increase in volume
- Dynamic complexity related risks are engendered from interdependencies that annihilate any improvement that could typically be gained by adding additional resources
- Time to deliver will continue to be a challenge and a source of rapid degradation
- Adaptability is modest as the system continuously leverages old assets to create new, adapted assets in response to new demands

Conclusion

Despite the board decision to proceed with the optimization project instead of taking a more aggressive approach, the risk of obsolescence was recognized as a real threat to corporate survival. Through the analysis provided by X-Act OBC Platform, it became clear that the current business model would only be sustainable for the short term and would become extinct as soon as alternative ecommerce and new business models began to proliferate.

To protect their market position and continuous efficiency of operations, it would be necessary to monitor market developments and further investigate longer term options that would help the company defend its competitive advantage in the long term.

About URM GROUP

URM GROUP helps businesses take advantage of advanced predictive and prescriptive analytics to optimally manage risk in today's dynamic business climate. We arm business leaders of global and dynamically complex organizations with the foresights they need to confidently and agilely respond to changing requirements and clearly understand which (and when) preventive and opportunistic actions should be taken to ensure the continuous efficiency and cost effectiveness of their operations.