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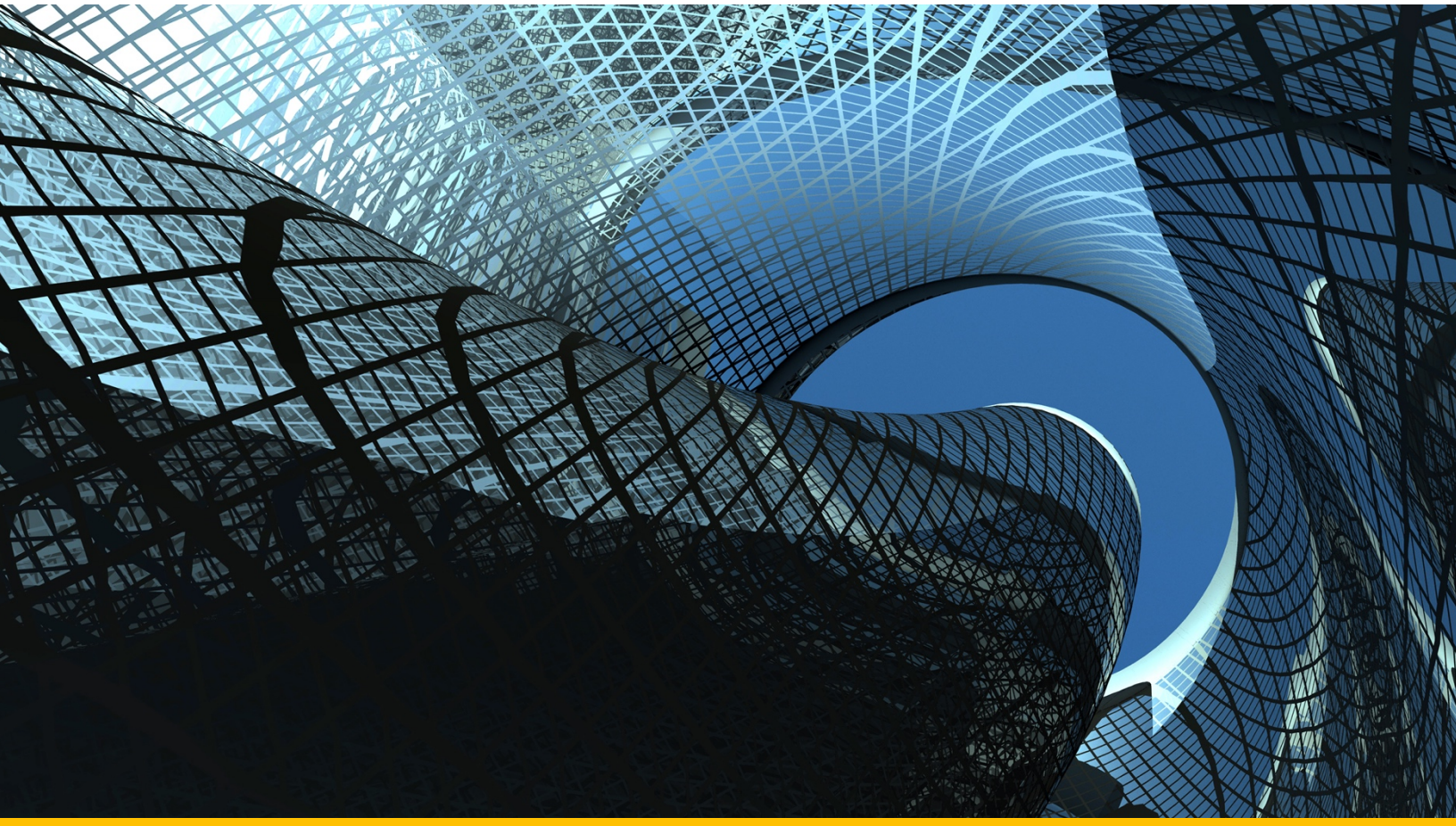


Intelligent Business Transformation

Taking a Computer-Aided Engineering Approach to Business Transformation with X-Act Platform

by Nabil Abu el Ata, CEO, URM Group

INTRODUCTION

Computer-aided engineering (CAE) is widely used in a range of industries to build the right product at best performance versus cost ratio. A main goal being to improve product designs or anticipate the resolution of potential problems as early as possible. Common benefits of CAE include lower development costs and time along with improved product quality and durability.

Business transformations are pursued to fundamentally change systems, processes, people and technology across an entire business or subdivision to achieve measurable improvements in efficiency, effectiveness and stakeholder satisfaction. However, many transformation programs fail to deliver the desired results. Time and money are wasted, while no significant improvements are gained. In the meantime, risks related to product or service obsolescence, rising costs, declining revenues or other factors that spurred the transformation in the first place, have grown.

To achieve the same benefits of CAE, businesses use the ideal emulation-based capabilities of X-Act® platform to manage transformation program risk, maximize value, decrease costs and accelerate innovation. The advantages of using X-Act platform in a CAE capacity include:

- Business transformation decisions can be made based on their impact on key metrics including performance, time to market and cost
- X-Act helps business transformation teams manage risk and communicate the long-term business implications of any decisions to all stakeholders
- Transformation programs can be evaluated and refined at any time using computer emulation rather than real world testing, saving money and time—while supporting a broader scope of upfront validations
- X-Act provides key risk and performance insights earlier in the transformation process, when changes are less expensive to make
- X-Act can reveal innovative solutions that may not have been considered plausible without the aid of computer emulation

CONTENTS

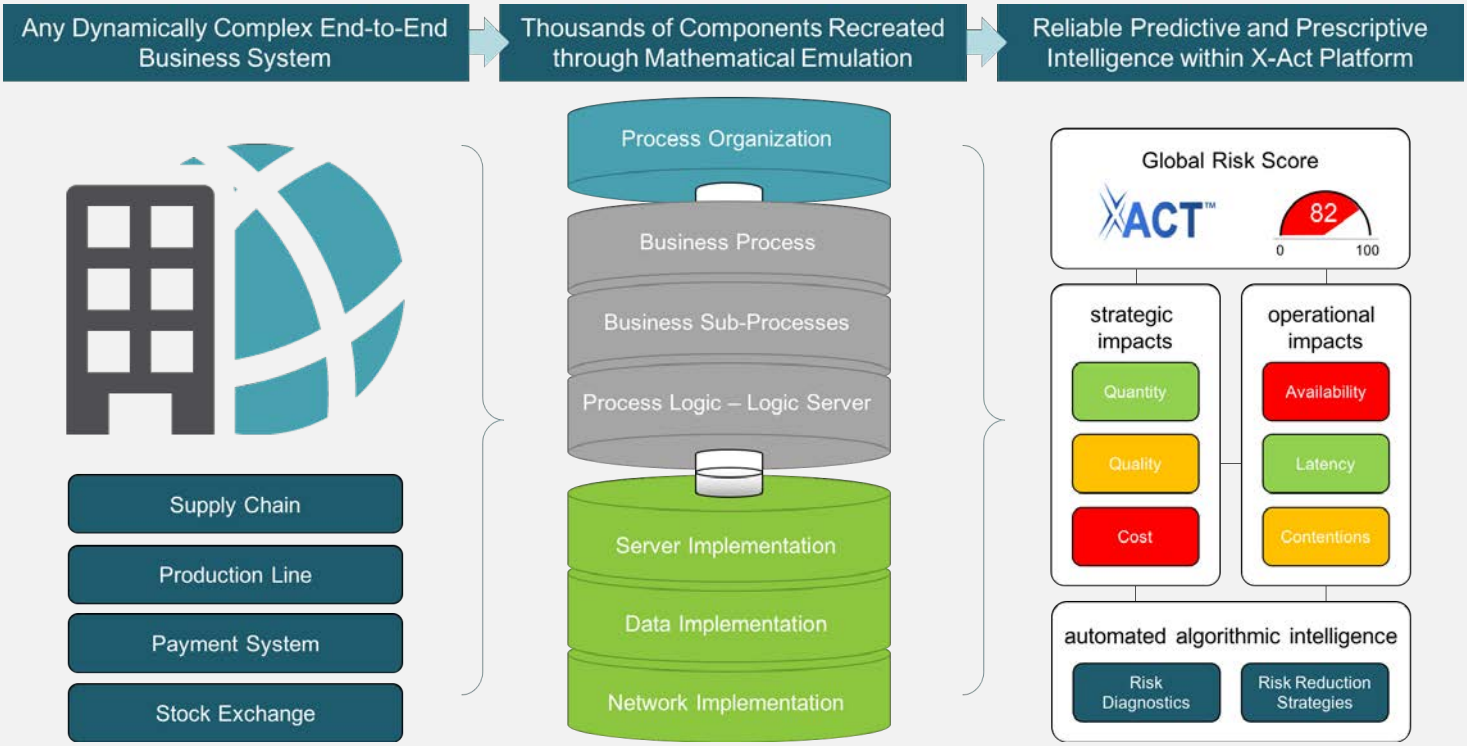
[1] ADVANTAGES OF EMULATION

Reliable Predictive & Prescriptive Intelligence

When businesses want to build best in class systems or ensure the optimal performance of exiting business ecosystems, computer emulation is an effective way to validate plans, predictively expose risks, and identify which corrective actions will achieve the desired results for any given situation.

X-Act platform algorithmically emulates business structures and produces advanced predictive analysis to determine the limits of dynamically complex systems, identify potential risks and recommend which corrective actions are needed to meet business objectives.

While CAE typically uses simulation to replicate system behaviors, these methods are not sufficient to cover a change in dynamics, meaning some risks will not be exposed until the event occurs because only the knowns are represented and so reproduced. X-Act uses emulation in place of simulation to mathematically reproduce risks that may occur under certain conditions even if there is no historical record of these events happening.



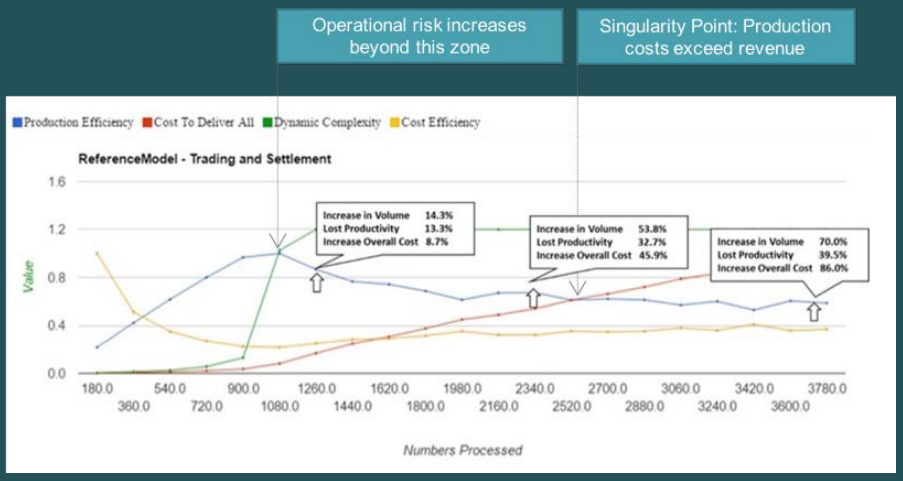
QUICKLY & ECONOMICALLY EXPLORE NEW SCENARIOS

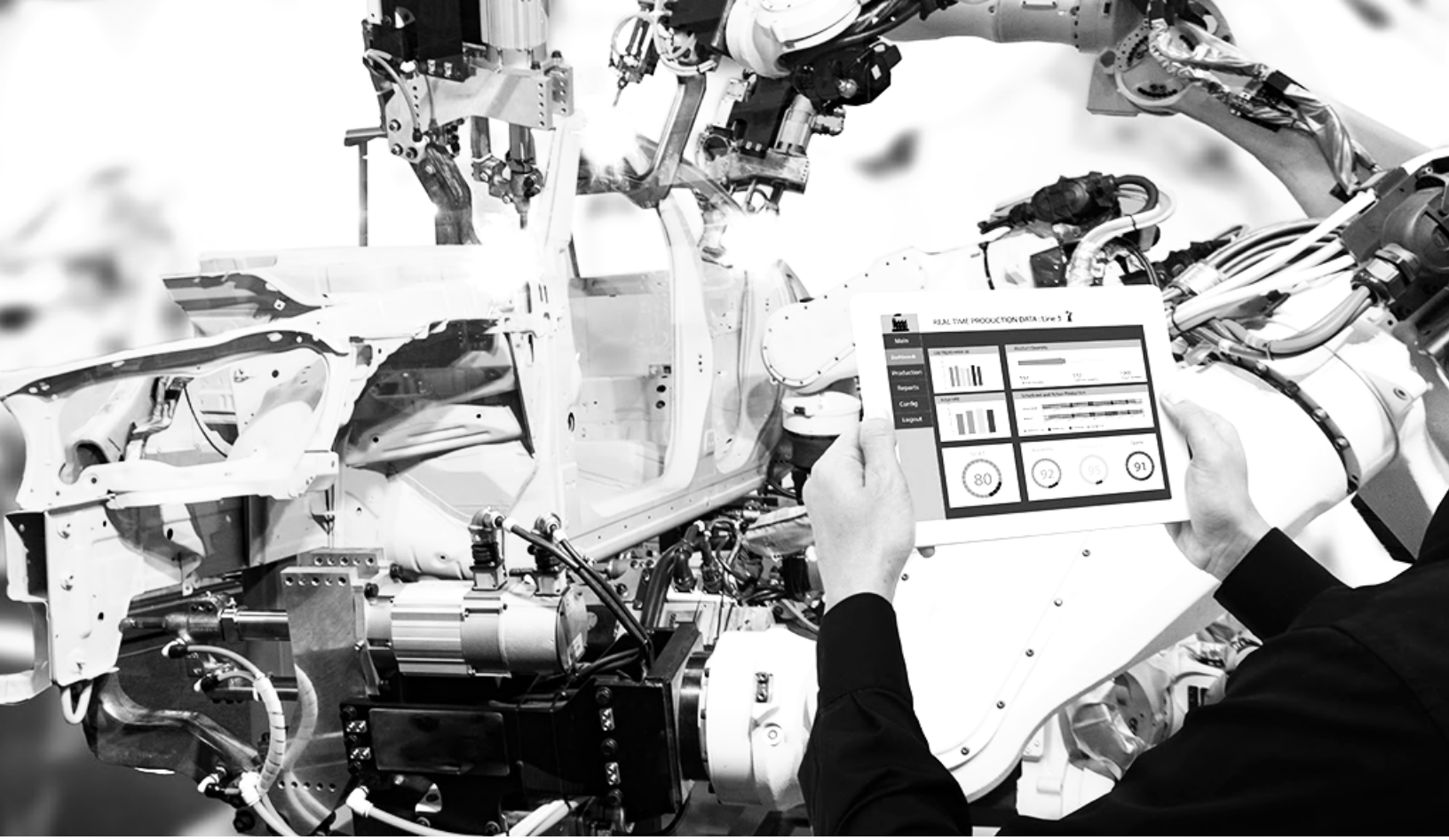
Once the emulation is successfully created within X-Act, it allows transformation teams to quickly test and economically explore an unlimited number of change scenarios that would otherwise be complex, expensive or even impossible to test on a real system. Users simply change variables—such as volume, architecture and infrastructure—or perform sensitivity predictions on changing process dynamics to observe the predicted outcome.

Validated through robust testing in hundreds of applications and various industries, X-Act provides visibility across complex business and IT ecosystems so that decision makers can quickly agree upon the most strategic plans and proactively take corporate actions with confidence in the outcome. Additionally, X-Act supports transformation programs by enabling users to test optimization and rationalization scenarios to confirm the best-fit solution before committing funds or resources to any project.

IDENTIFY RISKS

Using the end-to-end emulation created by X-Act platform, it is possible to determine whether a proposed change will increase operational risk, e.g. a decline in system performance or an increase in costs. Further, X-Act is able to pinpoint the cause of risks that other methods, including simulation, often miss.

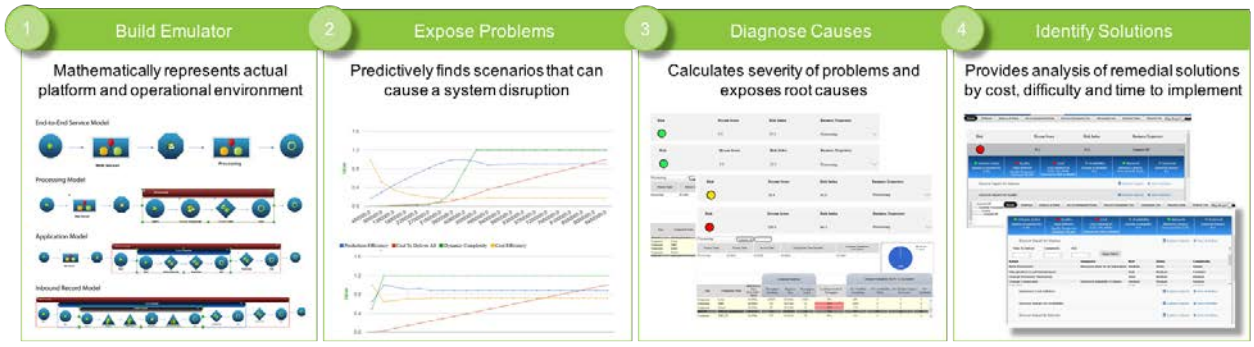




(2) GETTING STARTED

X-ACT 4-Step Process

X-Act users follow a 4-step process to construct the emulator, validate the accuracy, diagnose risk, identify the appropriate prescriptive actions and keep the emulator up to date with any system changes. Through a web-based interface, X-Act users are able to perform all necessary tasks from anywhere and at any time.

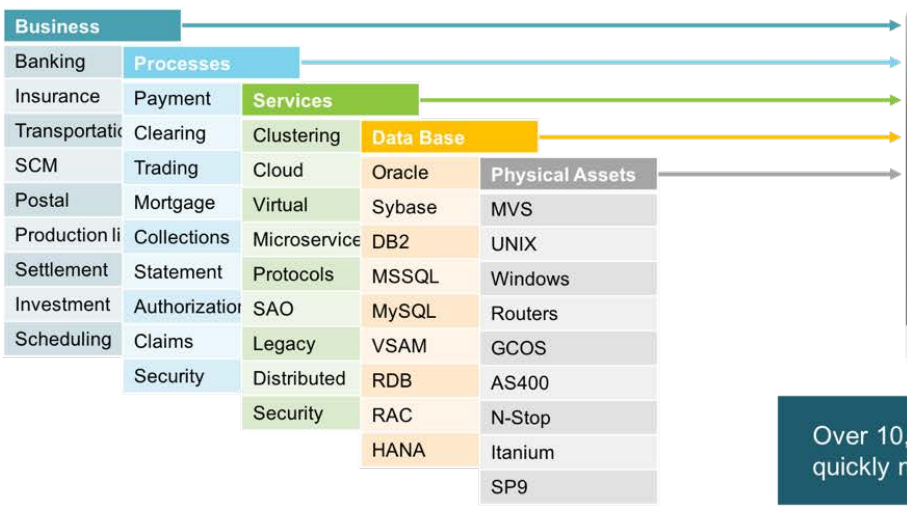


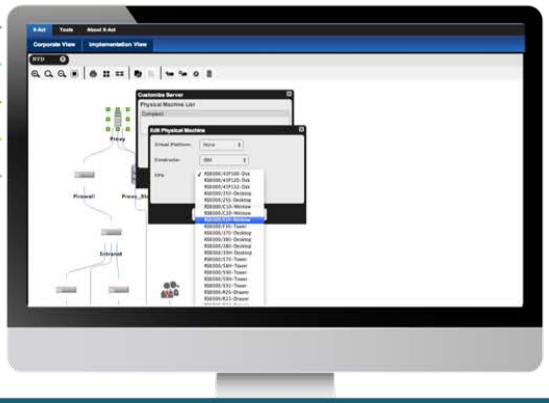
Using data gathered through interviews and automated extractors, users build the emulator to replicate the specifics of their enterprise. To help users quickly gain value and emulate even the most complex enterprise, X-Act users have access to a growing library of pre-built models that capture system dynamics and predicted behaviors of a diverse range of structures, organizations and industries.

System dynamics are encapsulated in the X-Act platform emulator. The deployed process allows users to control and manage the targeted environment, predict an eventual crisis or singularity points, and augment the libraries with their own newly discovered patterns to gradually build and support more intelligent automation.

X-ACT LIBRARIES

Every business system, whether it be a global supply chain, payment settlement system or manufacturing production line, has some characteristics that make the system unique, but in large part the system is built using common building blocks. X-Act libraries contain many of these common building blocks with over 10,000 certified dynamic patterns that can be used in the same way pre-built models are used in CAE to speed the delivery of designs and control processes. To build a representative model, users of X-Act simply select dynamic patterns from the libraries that span everything from common business operating structures and technologies to specific platforms and databases.





Over 10,000 dynamic building blocks help X-Act users quickly model all business and technology components

These dynamic patterns are created from mathematical emulation of business and IT ecosystems through algorithmic models that encapsulate behaviors, dependencies and surrounding rules for ecosystem behaviors so they can perform predictive analysis. Each model stores remedial options to support prescriptive actions for risk avoidance. They become, in effect, “dynamic Legos” modeling entire business ecosystems with IT and business infrastructure interdependencies.

(3) IMPROVING PLANS & AVOIDING UNWANTED RISKS

Example X-ACT Cases

X-Act helps organizations identify opportunities for improvement or risk avoidance within business and IT systems. This includes identifying and prescribing treatment for conditions that may cause future system failures or escalating costs as well as guiding all change management exercises. In each case, X-Act helps users justify decisions (including disruptive moves), control risks and achieve the best possible results.

Over the last 15 years, X-Act has saved businesses millions of dollars by identifying risks and the necessary corrective actions before investments and resources were committed. In other less opportunistic cases, businesses have used X-Act after a transformation program has gone wrong to determine the root causes and most effective solutions. Sample cases include:

Settlement & Clearing System: In a newly delivered settlement and clearing system, X-Act discovered that the system lacked any control over the number of cycles allowed before a match was made. Meaning that the outstanding number of cycles could become so large that the throughput of the system would severely suffer. Since X-Act was not used until after the system was built, an additional effort of 16,000-man days was necessary to fix the problem.

Wholesale Business: A wholesale business was exposed to an operational risk when they discovered it was not possible to verify the location of inventory through the POS (point-of-sale) terminals as planned. A new implementation had to be developed from scratch. Proactively using X-Act for testing would have allowed the business to verify that the proposed implementation would meet all business requirements from the outset.

Social Welfare Program: A nationwide social benefits implementation planned on using 13 datacenters with 2X replication, but this plan introduced a risk of redundant fraud. Using X-Act, a better plan was identified using two datacenters with a cross business continuity protocol to minimize the operational risk. The delivery of the solution was monitored and controlled using X-Act to ensure the ongoing success of the project.

Postal Services: A postal services implementation planned on using 75 sorting centers, but X-Act emulation proved that 22 sorting centers would be sufficient and would not alter the service quality or volume capacity in any way.

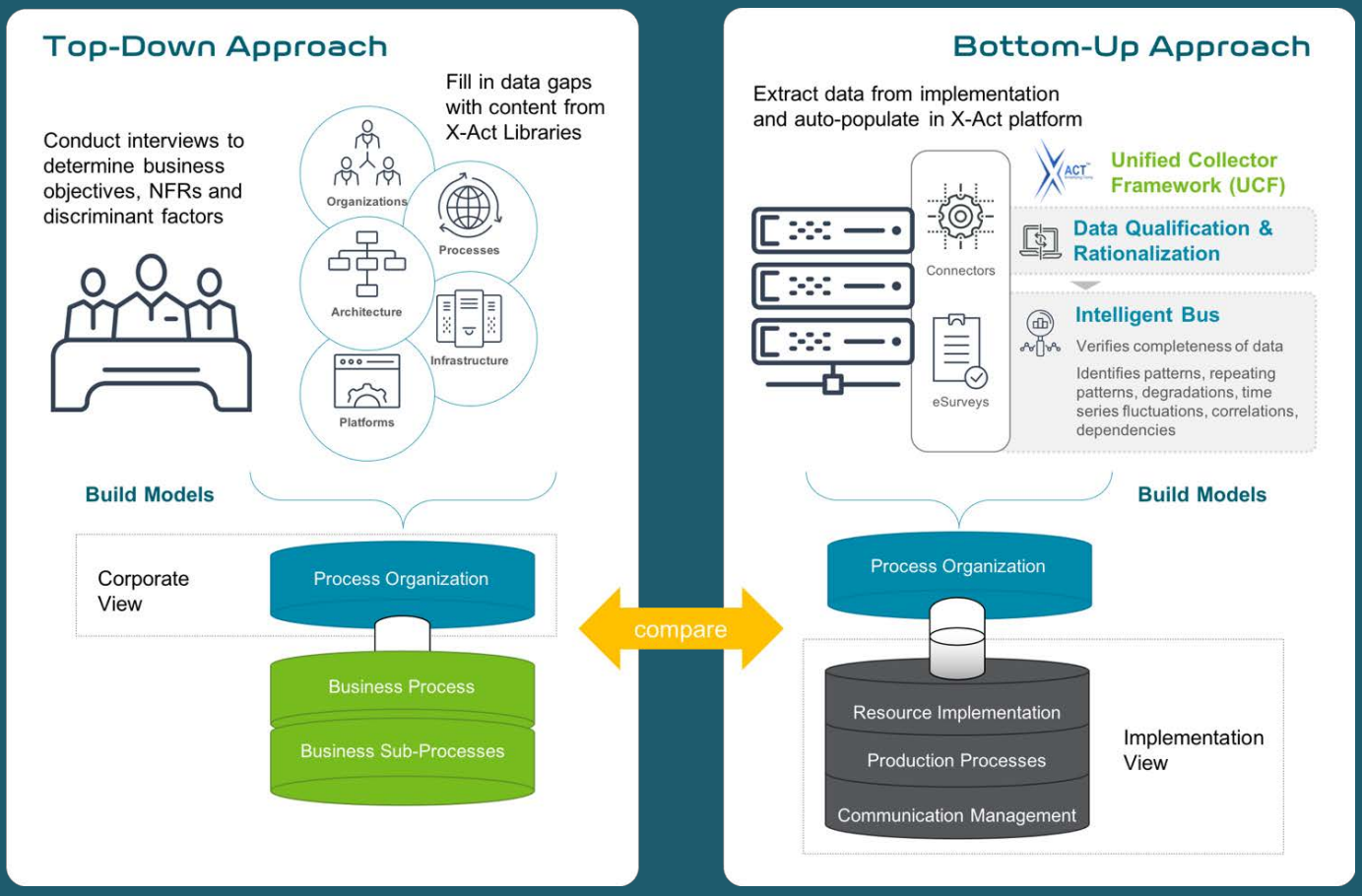
(4) Executing an Emulation-Aided Transformation

Better Business Outcomes

To create more resilient businesses and ultimately more value, it is necessary to build and maintain operational environments that deliver the best performance with the best economy. However, given the rate of innovation and market evolution, this can only be achieved by choosing architectures that enable organizations to agilely adapt to constantly changing requirements and achieving the level of risk management maturity necessary to proactively respond to evolving risks—even those without any historical precedent.

As the rate of change intensifies, businesses will struggle to survive if they cannot define and make the right moves at the right time to achieve better economy, control risk and support critical renewal. In this capacity, advanced predictive analytics and mathematical emulation techniques can help guide and test strategic transformation decisions as well as manage the project to ensure an optimal outcome.

Users of X-Act follow a six-step process to clearly identify when and which transformation actions should be taken to support the continuous efficiency and effectiveness of operations and manage the change program to ensure the desired results are actually achieved.



STEP 1

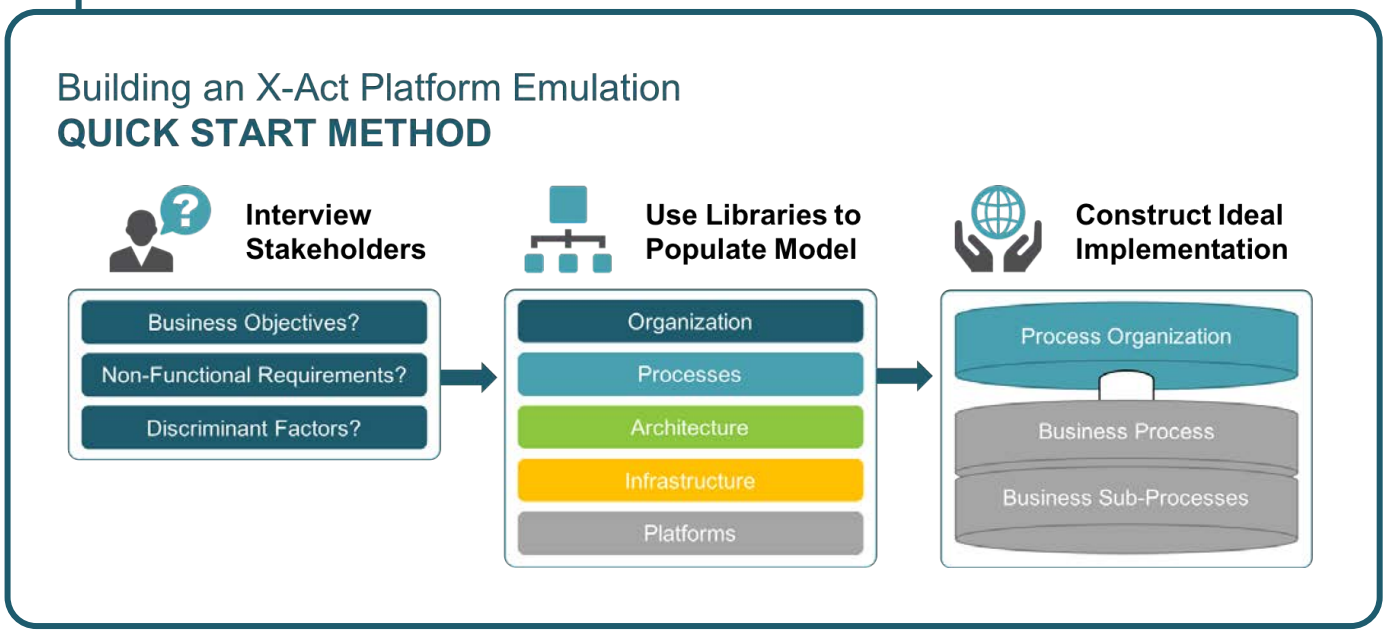
BUILD EMULATION OF IDEAL IMPLEMENTATION

First users of X-Act construct an quick start emulation of the target system based on inputs from subject matter experts. This is a top-down approach that places emphasis on collecting knowledge related to business objectives, non-functional requirements (NFRs) and discriminant factors. Based on the information gathered, a model is built using the X-Act libraries, which contain pre-certified, dynamic patterns that represent best in class implementations. Therefore, this version of the emulator provides a predictive platform that can be used to analyze the ideal scenario and the corresponding metrics of any transformation program.

Executing what-if scenarios and stress testing allows stakeholders to quickly gain predictive insights, like… How might risk evolve? What conditions might cause poor performance? What impact would competitor advances have on revenues? Armed with these insights, stakeholders can test various transformation scenarios to identify the best way to meet any defined set of business objectives—including cutting costs, increasing quality or volume of production, improving competitive position or increasing revenues.

Using library components, stakeholders can explore the benefits and risks of disruptive moves including the adoption of new business models, introduction of new products or services or use of new technologies, like blockchain or robots.

This is helpful during the early stages of design or when creating a new business, since real-world measurements are not yet available. But it also allows businesses to examine their current implementation against the benchmarks of an ideal situation and metrics to gain insights into what is possible.

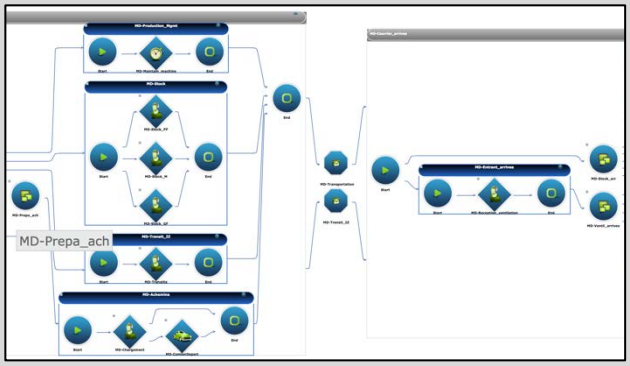


STEP 2

BUILD EMULATION OF ACTUAL IMPLEMENTATION

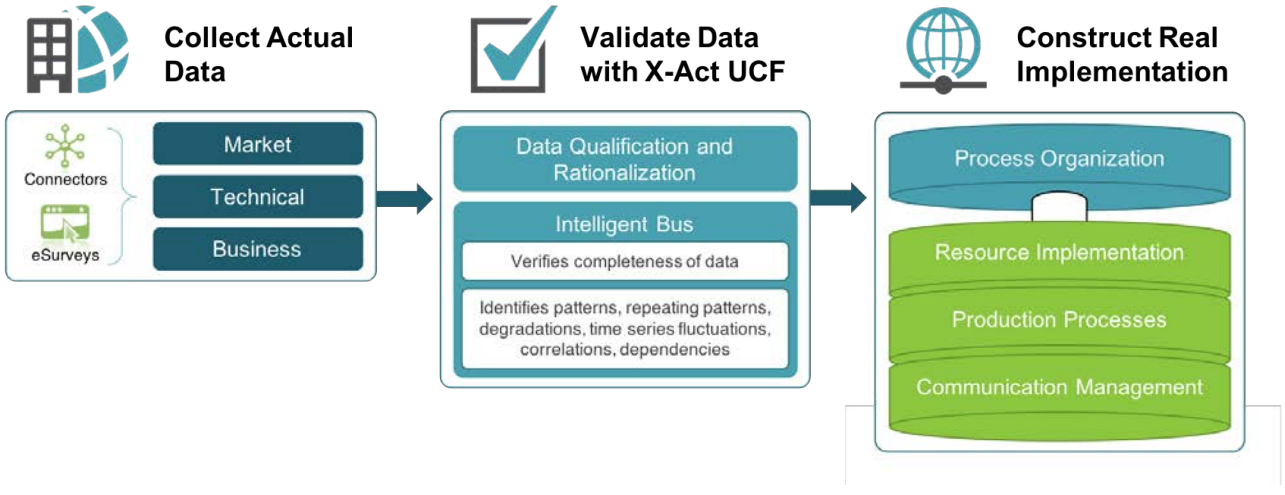
Next, X-Act users build an emulation of the actual business in its current state. This is a bottom-up approach that focuses first on the IT infrastructure that supports business operations. In this case, the libraries are a useful starting point for building a representative model, but each component must then be customized using real measurements collected through e-surveys or automated data extraction.

Models Are Customized Using Actual Measurements



The point and click features of the X-Act platform make it very easy to update the model as knowledge is gained. Each level of the model hierarchy depends upon a list of objects that users can change on demand and continuously update, or augment as needed to match the reality of the business environment.

Building an X-Act Platform Emulation
DETAILED METHOD



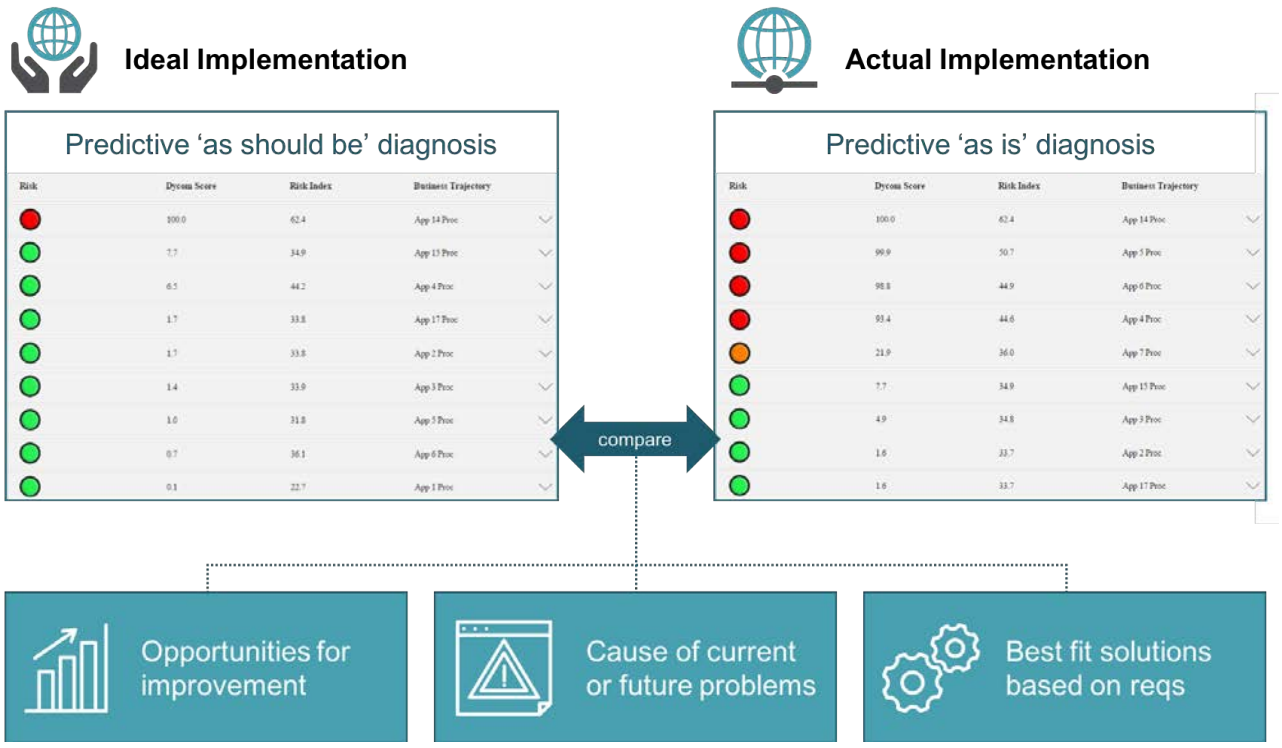
STEP 3

COMPARE IDEAL VS. ACTUAL METRICS

After building and verifying the accuracy of the emulators, X-Act users then perform a comparison of the ideal versus actual implementation. This helps X-Act users diagnose issues and identify which actions are required to transform business systems into a preferred state.

Any deviations between the ideal and actual implementation can be analyzed to identify the related origin and causes, as well as define which actions are needed to change the systems, processes, people and technology across the entire business ecosystem to achieve the desired improvements in efficiency and/or effectiveness.

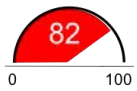
COMPARE IDEAL VS. DETAILED TO GAIN INSIGHTS



"X-Act alerts stakeholders of potential problems and guides transformation decisions."

X-Act Risk Scoring Metrics Expose Potential Problems

X-Act platform interface shows how business processes will be impacted by any proposed changes through dashboard indicators and scoring metrics.



Global Risk Score (GRS)

Measures severity of risk and level of effort required to reduce the risk

- A GRS less than 10 is typically curable through resource upgrades
- A GRS greater than 90 may require re-org, re-architecture or redesign

Dynamic Complexity Indicator (Dycom)

Captures risk due to interconnectivity between all processes and structures

A Dycom score over 30 will lead to a reduction in throughput, meaning the cost to deliver the same volume will begin to escalate.

Resource Rarefication Indicator (RRI)

Captures risk due to shortage in any resources or physical assets

If RRI is over 40 but Dycom is less than 20, the risk is due to a lack of resources. If RRI and Dycom are both over 60, a risk may be imminent.

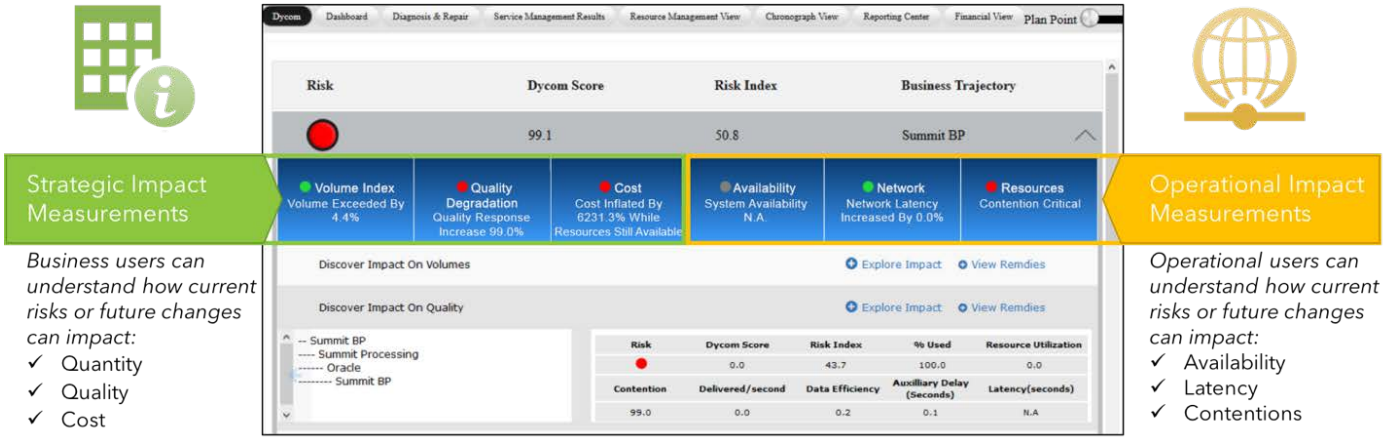
What-if scenarios can be used to predict any future risk that would be disruptive to the goals of the organization

Dashboards are color-coded to indicate degree of problem:

- Green indicates that no problems have been found
- Yellow is an alert that something may happen
- Red indicates a problem with an associated metric

X-Act Dashboards Deliver Deeper Strategic and Operational Intelligence

Users can drilldown to discover the cause of the risk and anticipated business and operational impacts.

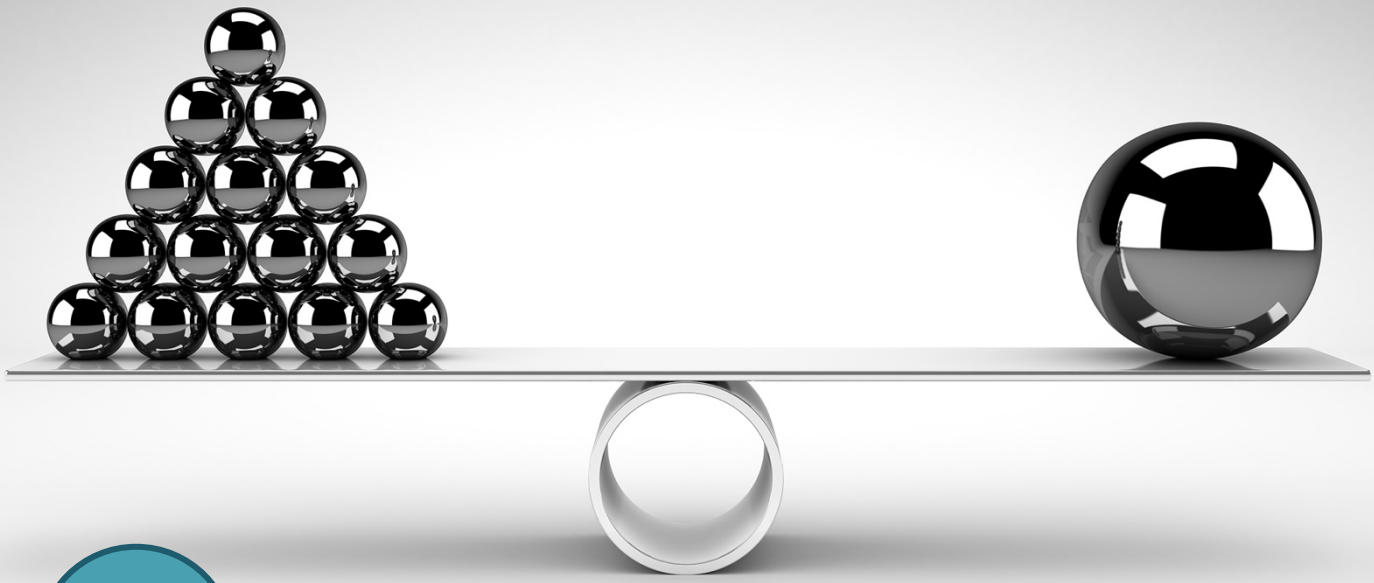


Business users can understand how current risks or future changes can impact:

- ✓ Quantity
- ✓ Quality
- ✓ Cost

Operational users can understand how current risks or future changes can impact:

- ✓ Availability
- ✓ Latency
- ✓ Contentions



STEP 4

CREATE A TRANSFORMATION PROGRAM PLAN

To support the best possible solution, X-Act platform provides users with the algorithmic intelligence they need to define the right transformation actions and understand the expected ROI, time to deliver and complexity of each remedial action.

Knowing that the proposed improvements will lead to the desired results allows business leaders to make decision with confidence. With this approach, we have helped clients in many highly critical industries achieve higher volumes and quality of service at a lower overall cost to the business.

USE X-ACT TO IDENTIFY THE BEST FIT SOLUTION BASED ON BUSINESS & OPERATIONAL REQUIREMENTS

Risk	Dycom Score	Risk Index	Business Trajectory
🔴	100.0	66.6	Balance Accounts
🔴	99.5	45.5	Trading And Settlement

Volume Index	Quality Degradation	Cost	Availability	Network	External
Volume Exceeded By 7.7%	Quality Response Increase 42.8%	Cost Inflated By 10909.2% While Resources Still Available	System Availability N.A	Network Latency Increased By 84.0%	External Factors N.A

Discover Impact On Volumes

Explore Impact | View Remdies

Action	Diagnosis	ROI	Delay	Complexity
More Processors	Resource Near Or At Saturation	Medium	Short	Simple
Virtualization (Load Distribution)		Fast	Medium	Complex
Change Processor Technology		Slow	Medium	Medium
Change Component	Resource Reliability Problem	Medium	Medium	Medium
Virtualize		Fast	Medium	Complex
Create Failover Component		Medium	Medium	Medium
Re-Architecture / Infrastructure		Fast	Long	Complex
More Processors	Unacceptable Response Time	Medium	Short	Medium

STEP 5

MANAGE PROJECT OUTCOMES

X-Act provides IT teams with the communication, planning and monitoring capabilities they need to proactively meet business requirements and optimize the use of systems and resources without any unintended impacts on the volume and quality of production.

Using X-Act throughout the transformation project allows system stakeholders to:

- ✓ Verify that the business goals will be met
- ✓ Ensure changes will not lead to a high level of risk
- ✓ Keep volume, cost and quality constraints aligned

By using X-Act through all phases of the transformation project, users can quickly, cost-effectively and exhaustively test any system changes against business requirements, discover performance issues and develop the appropriate remedial strategy. X-Act engineering dashboards cover both the logical (architecture) and physical (system infrastructure) levels to provide IT teams with the deeper technical insights they need to successfully manage the execution plan.

X-ACT HELPS IT TEAMS MANAGE THE EXECUTION PLAN

STEP 6

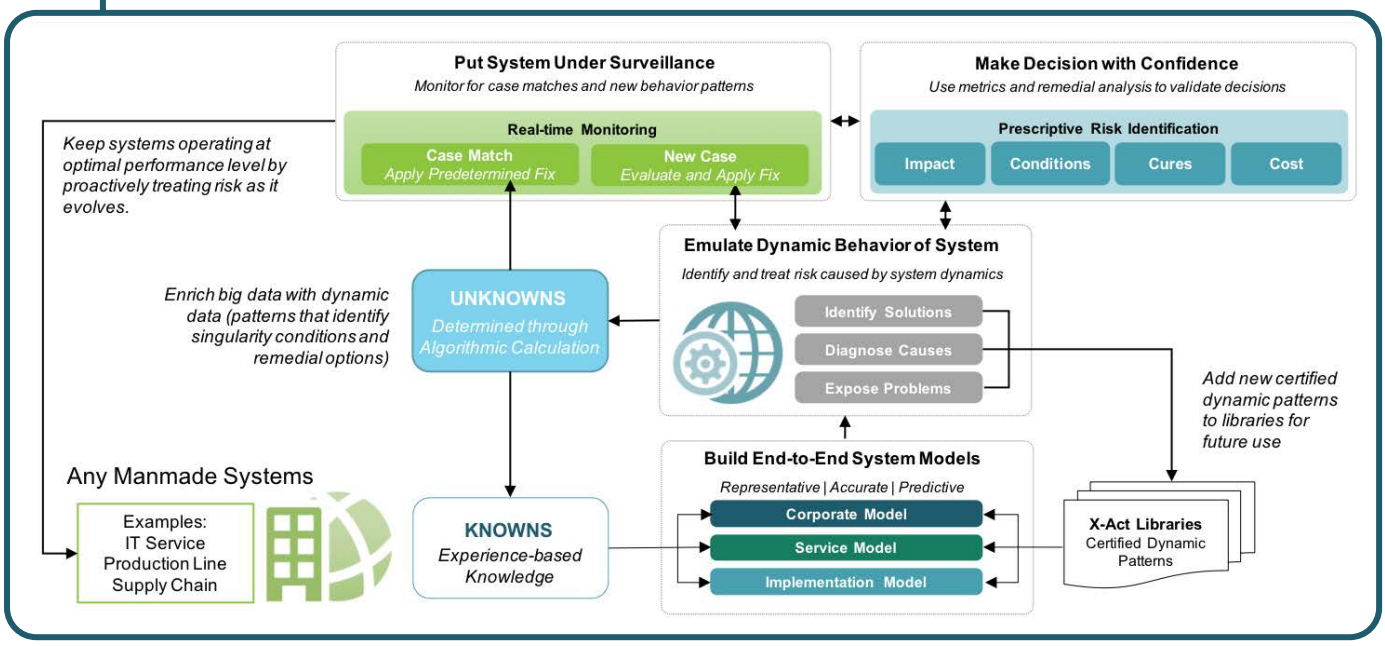
MAINTAIN AN OPTIMAL POSITION

Optimal productivity equates to the delivery of business goods or services at a minimum cost, while maintaining acceptable service quality. Through our research, we know that once a business moves beyond the point of optimal productivity, any additional increase in volume will cause a deterioration in productivity and an escalation in cost. Additionally, the enterprise is running inefficiently before the optimal productivity point is reached.

If business leaders wish to proactively manage, they must be able to predictively examine the evolution of their business. If the maximum productivity is about to be reached, the business should be prepared to take immediate action before cost inflation occurs or adjust business goals until re-engineering is possible. In all cases, X-Act platform can help companies evaluate their transformation options and choose the optimal solution.

The situational data revealed by X-Act creates a new class of artificial intelligence, known as generative intelligence, which is used to identify risks before they occur and determine the appropriate response. These risks are unknowns in statistical methods, which are limited to prediction based on data collected through experience.

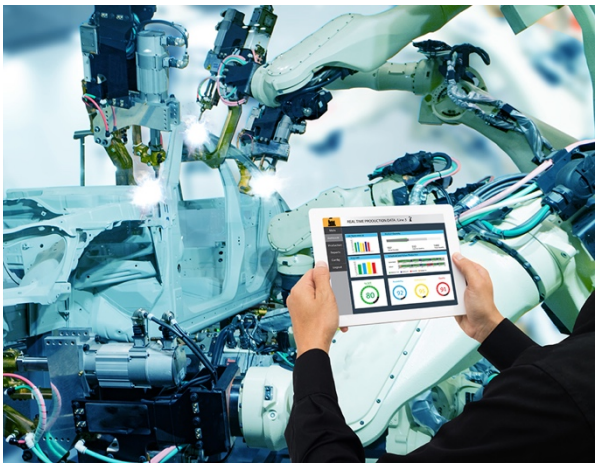
X-Act helps businesses identify a potential risk as it evolves—with immediate analysis of root causes and proposed remedial actions. With a continuous enrichment of case-based knowledge, businesses have the rational and unbiased mechanisms they need to maintain the best long-term position.



Common Ways X-Act is Used to Support Transformation Program Decisions and Outcomes

New Construction

In this case, all the layers—from business through to infrastructure—of the system are built from the top-down using library components. This allows business, IT and production line stakeholders to start first with an ideal construct and vet all subsequent decisions by comparing the predicted outcome against the best in class implementation with full knowledge of the impacts at all levels from the top down. As decisions are made, new constructs can be certified and then added to the libraries for future use.



Optimization

X-Act helps organizations identify opportunities for improvement or risk avoidance within existing business and IT systems. This includes identifying and prescribing treatment for conditions that may cause future system failures or escalating costs as well as guiding all change management exercises. In each case, X-Act helps users justify decisions (including disruptive moves), control risks and achieve the best possible results.

Strategic Boardroom Planning

X-Act helps board members prepare for the future and make decisions with confidence in the financial and operational impact to the business. This includes intelligence relating to mergers and acquisitions and business renewal decisions as well as informative exercises such as competitive analysis or comparisons of current versus ideal business operations.

Conclusion

Using X-Act platform in a CAE capacity allows businesses to better manage transformation program risk, maximize value, decrease costs and accelerate innovation. By delivering clear and actionable intelligence from X-Act, stakeholders are able to identify and agree upon the best-fit solution before committing any time or resources to a transformation program.

During the execution phase, X-Act provides the foresights necessary to ensure an optimal outcome that weighs both short and long-term cost benefits in alignment with performance and scalability goals so that the business can minimize risks and consistently gain all the intended benefits of the transformation program. Ultimately, these capabilities help businesses define and make the right moves at the right time to continuously achieve better economy, control risk and support critical renewal.

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URM GROUP is committed to helping organizations mature their risk management practices to more effectively and agilely respond to risks that are growing in frequency and severity due to the dynamic complexity of our modern world. Through our research and applied use of proven emulation technologies, we teach people how to proactively discover and control risks at the right time to avoid future surprises and unwanted outcomes. Our universal risk management methods arm business and government leaders with the foresights they need to confidently respond to changing dynamics and clearly understand which (and when) preventive and opportunistic actions should be taken to ensure the continuous efficiency and cost effectiveness of operations.