Microsoft Dynamics 365 and AI automate complex business processes and transactions

At Microsoft Core Services Engineering and Operations (CSEO), we’re using Microsoft Dynamics 365 to manage and automate our complex business processes and workflows. We track thousands of messages, orders, agreements, and amendments each day and we require a robust management system to efficiently process and manage our contract and transaction landscape. Therefore, CSEO developed COSMIC, or Customer Obsessed Solution Management and Incident Care, which is a contract and transaction-case management solution built on Microsoft Dynamics 365 with Microsoft Cognitive Services and Microsoft Bot Framework. COSMIC streamlines the tasks required to complete a transaction and call a case with a structured, system-guided workflow. It provides a clear end-to-end view of case progress and helps Microsoft track vendor performance and manage outsourced operations more efficiently.

Understanding the transaction landscape at Microsoft

The 100,000-person Microsoft partner and customer network generates more than $100 billion of revenue each year. Contract and transaction-case management and administration spans 13 internal business units, such as Channel Incentives, Microsoft Business Services, Volume Licensing, and Original Equipment Manufacturer (OEM), as Figure 1 depicts.

Microsoft largely outsources contract operations to vendors in multiple Regional Operations Centers (ROCs) worldwide, as the following data points illustrate, including that ROCs:

- Process transactions and manage inquiries via 3,800 agents worldwide.
- Handle 2.5 million transactions and inquiries annually.
- Process and manage 18 million email messages annually.
- Deal with multiple languages across 257 countries/regions.
- Apply and manage more than 90 compliance controls that the General Data Protection Regulation (GDPR), the Sarbanes-Oxley Act of 2002 (SOX), privacy, trade, and tax policies mandate.

Revenue processing is complex. Therefore, to remain competitive, we must digitally transform our business while simultaneously continuing to protect our revenue stream.

Figure 1 Complex transaction landscape at Microsoft
Recognizing the need for complete relationship management

Interacting with our partner and customer network, and managing the multitude of relationships within it, is a huge undertaking. Our previous management toolset didn’t allow us to capture and assess the complete relationship landscape, which made it difficult to quickly determine the status and overall health of individual relationships, contracts, and transactions.

Furthermore, with our previous case-management system for contracts and transactions, the agents managing those contracts and transactions had to maintain large amounts of case-specific knowledge. Agents had to know unique rules to work cases to completion and had to undergo extensive training on the system. Case tracking was not intuitive, and the system couldn’t grow to meet business needs. From a business perspective, multiple data entry points requiring human intervention resulted in redundancy and errors. We could summarize our high-level problems in three points:

- Our revenue-processing stream was too complex and there were too many opportunities for errors.
- We had to digitally transform and create a more-efficient process that enabled our business needs.
- We needed continual protection of our revenue-processing stream throughout our transformation.

Therefore, to drive our digital transformation, Microsoft needed a solution with a holistic, end-to-end view of customers, and that accommodated users, partners, and the Microsoft field organization. These agents must manage contracts and cases at any stage, from start to finish, and they required more nuanced ways to assess and refine business processes. Enter COSMIC.

COSMIC--a new, automated workflow management system

Using Dynamics 365 as its foundation, COSMIC offers critical case and contract management for Microsoft. Built on a concept that matches case tasks to qualified agents, workflow management in COSMIC is a configurable system that drives, tracks, and supports cases from intake to resolution. It uses attributes to automate case workflow and efficiently leads certified agents through each stage of a transaction. In COSMIC, you must complete each stage before you can proceed to the next. COSMIC segregates agent duties if local regulations require it, and it gives agents necessary SOX controls. Figure 2 illustrates a representative workflow and each stage:

**Figure 2 COSMIC automated workflow**

Our automated workflow breaks the case and contract management process into standardized steps. At each step, we have visibility into that specific step and automated controls that enable our agents to support the system-guided process. The workflow process has seven major steps:

1. Receive request. Requests come in by email or the request tool.
2. Digitization of values and case creation. You digitize case details from source documents and prepare them for the workflow.
3. Triage. You determine what sort of work was received and apply appropriate rules.
4. Validation. You review a request and check it for accuracy before processing it in the workflow.
5. Data entry. You process the case into the workflow.
6. Submission. Any actions that could not be completed by audit are completed.
7. Final acknowledgment and communications. You complete all actions and close the COSMIC case.

Microsoft needs to monitor and optimize the management of contracts and transactions, which COSMIC enables us to do. Business process management in COSMIC enhances and refines our control and analysis, optimization capabilities, and agent-performance assessment. COSMIC ensures that agents configure business transactions specifically for the business unit which they apply.

Using Dynamics 365 to create a foundation for business-process workflow

Our team evaluated different software options and chose Dynamics 365 for Customer Service as the foundation for COSMIC. Dynamics 365 for Customer Service offers multiple out-of-the-box features that we could integrate immediately into our case-management process and also provides an integrated solution for the needs of Microsoft Business Process Operations.

Additionally, the Dynamics 365 platform offers built-in enterprise-level scalability, security features, and performance, and allowed us to build COSMIC into a modern engineering software platform with reusable services. This increased our expansion and integration capabilities. At its core, COSMIC is a collection of services conjoined with Dynamics 365 for Customer Service workflow processes to create a system-guided workflow solution.

Dynamics 365 allows us to turn on and turn off COSMIC features, depending on what functionality we need at any given time. This means we avoid costly code customization, and maintenance of that code. Long-term, it simplifies Dynamics 365 application upgrades and allows COSMIC tenants to adopt new features and capabilities faster.

Adopting system-guided workflow

Our previous solution required agents to be the primary driver of the business-process workflow within the case-management environment. Agents made decisions and advanced workflows, utilizing multiple systems within the workflow. They had the weighty responsibility for executing the process, which was vulnerable to human error.

Therefore, we set several important goals to drive creation of a new solution, including that it must:

- Remove complexity from the current workflow environment. Our previous environment required that agents know and work with several tools. We wanted to remove that complexity, while centralizing knowledge and unifying our tools, users, and processes.
- Centralize all case-management activities within one tool. We had to complete many tasks within case-management workflows using tools outside our previous system. However, we wanted a single solution that captured and managed all aspects of case-management workflow and enabled end-to-end management and visibility.
- Create system-guided workflow processes. We wanted to remove agents as the primary drivers for workflow and create an automated, managed workflow process that operated autonomously without requiring human input to propagate and complete the workflow.

Extending COSMIC with services

COSMIC serves as the foundation for system-driven workflow, but it’s also a flexible and modular foundation, based on service-focused design. We can expand COSMIC functionality easily with new services, and we can leverage or
repurpose any services that we use across the platform to create new functionality. Services provide critical functionality, and we’re continuing to build and optimize the services that COSMIC uses to drive efficiency and business value. The following sections detail examples of services that we’re integrating with COSMIC, including:

- Omnichannel Chat
- Digital data capture
- Email analytics for translation and sentiment analysis
- Optimized attachment management
- A PowerApps agent interface

**Omnichannel Chat**

Email is the primary COSMIC interface between our customers and agents. In the past, status messaging within our system was not intuitive, and we had latency issues. When our field organization wanted to review case information or ask agents questions, they had to communicate outside COSMIC and those exchanges weren’t necessarily captured or tracked as part of a case.

However, we’ve extended the COSMIC customer interface by using the Omnichannel Chat service and Microsoft Teams to provide interactive chat functionality. Omnichannel enables our customers to interact with an automated chat bot and the agent in an interwoven human and AI experience. Additionally, Omnichannel enables us to use our knowledge bases and information systems to answer common questions using an automated chat bot, while continuing to provide a human point of contact for interactions that require agent intervention.

Omnichannel uses AI and Microsoft Teams, the latter of which enables people within Microsoft to receive instant case updates, add notes directly to a case in COSMIC, and follow a case using auto notifications. Our agents and customers can check the status of transactions and holds, add information to advance a case, and submit a COSMIC case number in Microsoft Teams. A bot provides options for interacting with or following a case via Microsoft Teams, and the COSMIC bot interaction is logged into case data so that it appears in relevant dashboards. COSMIC will replicate case status is on any device that is running Microsoft Teams.

**Digital data capture**

We’re using digital data capture to digitally transform our business by taking customer-submitted information and transforming it into digital values that COSMIC can understand and manipulate. It’s a suite of services that address the many ways that we receive customer input and it provides several capture methods, including that it’ll:

- Directly read digital documents such as Microsoft Office documents or Portable Document Formats (PDFs).
- Use optical character recognition (OCR) to digitize paper-based input so that we can include it into a case workflow.

For example, a customer might submit information through one of our external portals or by email. Most documents that customers submit to COSMIC receive a document number, and the system uses that number to identify fields and updates the applicable case with that information. The API’s OCR capability scans and validates document data, and then sends a summary to the applicable agent. This reduces average handling time for agents by eliminating the need for routine manual validation and data entry, and it empowers agents to prioritize more critical activities. We’re continuing to build the APIs and the suite of services to accommodate new information-capture scenarios and apply SOX controls and validations.

In our ideal state, COSMIC will automatically read and validate documents, so an agent doesn’t have to manually interact with them. However, if the process breaks, an agent can review the case. We’re not saying that having manual steps isn’t acceptable. It is, if there’s no mechanism whereby you can automate certain steps. However, you have to know where those manual steps are so that you can locate and troubleshoot a breakdown and thereby remove a process defect.
Email analytics for translation and sentiment analysis

Email analytics offers automated translation services, which means that certain tasks can be language—and location—agnostic. Email analytics also is an easy way to measure customer satisfaction.

The Translator Text API provides automated translation services. For example, a customer can submit an order in German, and then the API can translate it and a Spanish-speaking agent can process it. Therefore, not all agents must be multilingual, which gives us flexibility in how we perform certain tasks.

**Microsoft Azure Cognitive Services** are services that provide a text-sentiment analysis score for email and text messages, which help us gauge customer likes, dislikes, wants, and needs, and also measure the quality of customer interactions. The Text Analytics API returns a numeric score between 0 and 1. Scores close to 1 reflect positive customer sentiment, while scores close to 0 indicate negative feedback. This feature is critical when we assign cases based on customer experience. We may want to assign a senior agent to a case if the sentiment is low. Figure 3 illustrates an email that Cognitive Services translated from Spanish to English, and then assigned a sentiment score utilizing a smiling emoji:

![Figure 3](image)

**Figure 3 Machine translation and sentiment analysis**

Optimized attachment management

The Attachment Management solution manages notes and email attachments using Azure Blob storage, and then attaches them to a case workflow. It optimizes Dynamics 365 storage and provides retrieval on demand and provides a document-retention system in COSMIC. It can manage multi-attachment upload and download controls, such as drag and drop, one-click download of multiple attachments, and attachment preview. You can download **Attachment Management for Dynamics 365** from **Microsoft AppSource**.

Automated Validation

Our business workflow must adhere to several business, program, and compliance policies. Previously, our policy-validation processes required that agents manually confirm compliance for each policy component before the case could proceed. However, the Automated Validation functionality allows us to leverage our digital data-capture results to analyze case data and apply automated, predetermined policies against a case workflow. If Automated Validation is unable to confirm compliance, COSMIC workflow forwards the case to an agent who remediates and then continues the workflow.

Automated Validation enables our agents to focus on the tasks that most require their intervention, and it makes our workflow process much faster. We also have full visibility into these processes within the system because workflow
validation and remediation tasks all happen within COSMIC. This holistic view enables intelligent analytics and audit capabilities.

**PowerApps agent interface**
We built an internal agent interface that centralizes the agent experience within COSMIC. All agent work and interaction with a case happens within this interface. We can use digital capture and automated validation to centralize all necessary case data in COSMIC and create an end-to-end experience for agents, who never need to leave COSMIC. We created this interface in Microsoft PowerApps, leveraging the platform’s capabilities to create an easy-to-use interface that doesn’t have a large amount of code and complexity behind it.

**COSMIC technology platform**
Dynamics 365 for Customer Service supplies the system-guided base for COSMIC. We use Dynamics 365 to control the end-to-end workflow starting with an email or paper submission to the final outbound case email, and all of the triage, validation, data-entry, and submission processes that happen in between. We use Microsoft Azure services, Microsoft Power BI, and PowerApps to build and add services that integrate with COSMIC, creating functionality that supports the core COSMIC capabilities.

**COSMIC API**
We’re also using the COSMIC API to create integration possibilities with existing business applications and systems of record, such as SAP, to use data in these systems to supplement the workflow data stream and provide comprehensive workflow management. Figure 4 illustrates how the API enables us to integrate with these services without the need for complex code workarounds, and it enables a smoother transition to digital transformation:

![Figure 4 The COSMIC technology platform](microsoft.com/itshowcase August 2019)
COSMIC on AppSource

We’ve made COSMIC publicly available through Microsoft AppSource, at which you can search for assets published by Microsoft Labs, including:

- Dynamics 365 for BPO
- Email Machine Learning
- Email 2 Case using AI
- Attachment Management
- Dynamics 365 Data Archival and Retention

Configuration rather than creation

We utilized agile software development, with an emphasis on failing fast, learning, and attaining the right functionality at the last minute. We committed to configuring existing software features rather than creating labor-intensive custom code, such as:

- Creating SLAs. To configure an SLA, like a credit-risk transaction, you use Dynamics 365 to define the components, such as business function, business unit, case type (such as transaction), and operations center. You can configure success criteria by choosing success (completed within 48 hours), warning (message sent if no progress after 24 hours), and failure controls and actions.

- Defining business stages. We stitched together workflow stages in Dynamics 365. For example, in the intake or Ops In stage, we simply toggle required fields such as title, business function, received date, reason, and similar on or off as necessary. You can configure this process for one or more business units.

Customize occasionally

The reality is that business is complex, and that complexity drives unique business-unit needs. However, we had situations in which we needed specific functionality, so we created new components. We created customized and reusable components, such as our Attachment Management solution, which is publicly available at Microsoft AppSource.

Benefits

COSMIC has provided numerous benefits, as it enabled us to streamline, simplify, and remove redundant back-office work. It’s now easier to see across our system, and our detailed, structured workflow helps us quickly find bottlenecks and troubleshoot issues. At the same time, we’re taking advantage of cloud technologies for AI and machine learning.

There are numerous other ways in which we benefit from COSMIC, including using it to:

- Efficiently manage vendors by using workflow and data. COSMIC reduces agent errors. Agent-guided and structured workflow ensures that we route issues to qualified agents and it enhances the company’s understanding of vendor performance and efficiencies.

- Provide dashboards and reporting so we can help assess performance. The COSMIC dashboards enable our agents and supervisors to quickly view how many cases are in progress, what stage they’re in, and how long it takes to complete a task. Dashboards and reporting help us understand performance gaps and develop training opportunities. We have higher quality assessments because we have better tracking for every stage. We can see where vendors are most skilled and then identify strengths (or weaknesses) within a group.

- Allow precision holds to drill into issues. The ability to apply multiple holds in a single case, and rich reporting on holds, helps us refine workflows for our agents and dig deep to find the root cause of bottlenecks.

- Enable data synergy between systems. Data flows easily and COSMIC segregates it appropriately between Dynamics 365, Power BI, Azure, and Microsoft SharePoint. For example, an instance of Dynamics 365 used for SOX control receives information from COSMIC, executes the appropriate workflows—including writing...
information into subsequent systems—and then returns a “process completed” value to COSMIC so that the case can move to the next stage.

- **Help secure data.** Integrated business rules segregate data and ensure that agents are able to view only the data they’re allowed to access. For example, public-sector information in the United States might not be visible to agents outside the U.S. for specific scenarios.

- **Track and trend issues easily.** By integrating Power BI, fields are reportable from COSMIC and we can extract data easily. Different business units are interested in their BI reporting based on COSMIC fields, and then with Power BI queries and reports, it’s easy for us to answer questions such as “How long does an order take?” and “How many holds are there now, and where are they?”

- **Provide straightforward dashboard visibility.** Dashboards—for both agents and managers—make it easy to view what’s happening with a specific case. Before COSMIC, we had to do multiple searches to find details. Now, Power BI dashboards highlight case data such as related revenue, case status, assigned agent, and date opened.

- **Grant sales organizations with case visibility.** The COSMIC bot enables us to use Microsoft Teams to expose case information to our field sales organization. Historically, the field-sales organization and other Microsoft employees used email and other communication methods to check their transaction status. However, with the COSMIC bot and Microsoft Teams, they now can instantly access case updates, add notes to a case, and follow a case with auto notifications.

- **Offer translation and sentiment by using AI and machine learning.** Azure AI and machine learning afford us the advantage of automatic text translation and immediate sentiment analysis, which provides flexibility in assigning tasks and an intuitive and easy way to gauge customer satisfaction.

- **Use the cloud.** Using cloud-based technologies means that we automatically update to Dynamics 365, Azure, and all other online applications. We scale easily and dynamically as the organization grows.

**Best practices**

Here are our best practices for using COSMIC:

- **Start simple.** By rolling out COSMIC with more simple business units and components, we built a solid base that allowed us to quickly configure unique features for our more complex business units and rapidly bring them online. We achieved the transition from old to new in 15 months.

- **Configure, don’t customize.** By configuring out-of-the-box Dynamics 365 features and functionality, we could rapidly bring new features into production and create reusable features that we can share.

- **Incorporate flexibility.** After you set a taxonomy structure, it’s hard to make changes. However, by factoring flexibility into our taxonomy structure, it gave us room to grow.

- **Integrate.** When we designed COSMIC, we integrated external systems like SAP and our customer-facing portals. Consider future integrations when you design taxonomy, as they increase automation and reduce touch time.

- **Know your data.** Old data definitions get lost quickly. When you create a new structure, export your business unit’s old structure into a repository—we created a data mart for this purpose—and provide a good data dictionary for it. This enables everyone to agree on the meaning of terms and status codes.

**Looking ahead**

Now that our COSMIC platform is in place, we’ll integrate more tools that will improve automation, AI, and machine learning at all steps of our transactions. We expect that service-level agreement (SLA) fails should decrease as our partners quickly and efficiently get the information that they need. Some highlights to which we’re looking forward are:

- **Using virtual operation centers to drive efficiencies.** We’ll deploy additional bots to complete prevalidation tasks. For example, regulations require that financial transactions coming to the Americas region must occur in the Americas region. We’ll complete some work offshore, but we must complete critical stages in the Americas to
comply with federal law. We’ll deploy bots for basic and stable transactions, and if a transaction has too many customized steps, we’ll send the work to an operations center for resolution.

- **Integrating natural languages.** Machine learning and [Cognitive Services](https://azure.microsoft.com/en-us/services/cognitive-services/) will improve natural language query-response and case automation. Machine learning helps us refine our knowledge of agent capabilities and strengths, the importance of specific deals, and other case parameters. These capabilities will support automatic case assignment to make the best match of customer to agent. This will significantly reduce manual case assignment and increase customer and partner satisfaction by assigning the agent who is best suited to the case, regardless of location. Our goal is to use integration of natural languages to reduce issues with the first contact customer-agent contact.

- **Extending our bot framework.** The integration of COSMIC and Microsoft Teams through our [bot framework](https://developer.microsoft.com/en-us/microsoft-teams/platform/bot-framework) means we’ve created new ways for our agents and field-sales organization to communicate throughout a case’s duration. Looking forward, we want to use AI to create other integrated experiences for our customers and partners.

- **Expanding the COSMIC API.** Many teams within Microsoft are keenly interested in driving automation through integration and the COSMIC API. Looking forward, the CSEO team will revisit and expand the COSMIC API.

### Conclusion

Digital transformation goes beyond technology. Business leaders must reimagine old business models and embrace a new way of bringing together people, data, and processes to create value for their customers. They also need to capture new opportunities for their organizations through intelligent systems.

Business challenges today are familiar: engaging customers, empowering employees, optimizing operations, and reinventing the value we offer customers.

At Microsoft, we’re continuing our digital transformation and are excited to be using Dynamics 365 as the foundation for COSMIC to provide us with key strategic advantages, such as:

- **Embedded productivity.** Finite resources mean that productivity is critical for businesses to scale. Our company must refine and automate our business processes. Therefore, using Dynamics 365, we embedded productivity tools—such as machine learning, automated translation, and sentiment analysis—directly into business processes. This saves us time and is more efficient.

- **Quick response times.** There’s a new speed of business. Our technology enables new business models to thrive at a much faster rate than ever before. To be successful, we need to help our people and processes respond quickly to market changes and capture new revenue opportunities. In COSMIC, we created a Dynamics 365-based system that’s almost entirely configuration-driven, and you simply turn on or off the features you don’t need. The lack of custom code allows us to bring new business units into COSMIC very quickly and seamlessly.

The COSMIC solution took a very complex transaction and contract-processing landscape that was operated by multiple vendors in several operations centers around the world, and streamlined it into a system that supports a consistent and structured workflow. In the process, the system has enhanced our outsourced business model, driven automation deep into our case-management workflows, and allowed us to closely monitor vendor performance and calibrate our business processes. COSMIC—built on Dynamics 365 for Customer Service and other cloud technologies—is the next generation of intelligent business applications that enables us to grow, evolve, and transform to meet business needs and capture new opportunities.

### For more information

**Microsoft IT Showcase**

[microsoft.com/ITShowcase](https://microsoft.com/ITShowcase)

**Driving Microsoft’s transformation with AI**

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Building modern, connected business applications

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